Allison Hybrids Deliver
Advanced Technology And Proven Reliability

Allison Hybrid H 40 EP™ / H 50 EP™
Proven Reliability, Durability And Performance

All over the world, fleets, cities and passengers rely on Allison. No matter where the road leads, Allison Hybrid EP systems have demonstrated real, bottom-line operating benefits to municipalities and fleet operators. Since 2003, buses equipped with Allison H 40 EPTM and H 50 EPTM have provided reliable service without sacrificing performance.

Allison is the world’s largest producer of hybrid systems for heavy-duty transit applications.

- Approximately 8,000 Allison Hybrids delivered world-wide
- In 230 cities worldwide
- In 43 of 50 states in the United States
- Nearly 800 million miles (more than 1.2 billion km) of reliable operation
- 41,078,950 gallons (155,500,741 liters) of fuel saved
- 406,465 metric tons of CO₂ prevented

Increased Accessory Power Through Electrification

Increased Accessory Power is a customizable electric distribution platform that provides power from the Allison hybrid system to accessory components such as electric air conditioning, electric air compressors and power steering systems. Simply put, the system improves on the hybrid’s efficiency by distributing the hybrid power throughout the bus. Increased Accessory Power is available in standard and articulated bus applications. In addition to improving fuel economy, Increased Accessory Power also:

- Allows accessories to operate at the most efficient speeds, improving energy management
- Increases brake responsiveness by building airbrake pressure faster than a conventional engine-driven pump
- Improves low speed maneuverability due to smoother power steering
- Enables faster interior cooling, without straining the engine or burning unnecessary fuel by running engines at high idle
- Allows for sub-component serviceability instead of replacing the whole box
- Replaces alternator and belt with a more reliable and efficient DC-DC converter
The Most Advanced Hybrid Technology Is Available From Allison

Efficient By Design
The Allison Hybrid EP system features a two-mode split parallel architecture — a pure mechanical path and a pure electrical path — to achieve the highest energy efficiency. The technology uses both electrical and mechanical paths to provide an infinite number of ratios, optimizing performance and fuel economy. The efficiency gains over other technologies enable this system to perform in both transit buses and coaches.

Fuel and Emissions Reduced
The Allison Hybrid EP system dramatically reduces both diesel fuel consumption and CO₂ emissions. An Allison Hybrid System improves fuel consumption up to 25 percent over a typical bus*.

The Allison Hybrid H 40/50 EP systems may also be equipped with a customized electric distribution platform that provides power from the hybrid system to accessory components such as electric air conditioning, electric air compressors and electric power steering systems, offering further economy improvements.

Regenerative Braking and Savings
When decelerating or stopping, the system converts the vehicle’s kinetic energy to stored electric energy. In effect, the motor becomes a generator. The energy to accelerate the bus comes from the braking energy saved. The regenerative braking capability can significantly extend the brake change interval by as much as 350 percent.

Quiet Operation
The Allison Hybrid EP system helps reduce noise pollution compared to conventional buses. At 79 db @ 10 meters, buses equipped with the system approach the sound level of passenger cars. Allison also offers an optional hush mode feature, allowing buses to operate with enhanced or maximum noise reduction for designated quiet zones.

*Results can vary depending on the duty-cycles.
The Best Route To Lower Cost Of Ownership

A fully automatic transmission from Allison, a trusted brand around the world, is the best way to keep your buses on the road while reducing total cost of ownership. With extended periods between maintenance and a proven track record of reliability, Allison puts you in control of your fleet and of your budget. Allison Automatics with Continuous Power Technology™ not only reduce vehicle wear and tear, but provide a safer, smoother and more comfortable rider and driver experience. From the route to the bottom line, Allison puts you in control.
Fast, **Smooth Acceleration**

A bus equipped with the Allison Hybrid EP system significantly out-accelerates a similar bus equipped with a conventional drivetrain or an alternative fuel system. With the Allison Hybrid EP, the acceleration is smooth and seamless. In fact, drivers and passengers prefer Allison Hybrid to standard buses because the ride is so much smoother and more comfortable.

With Allison’s HyGain™ feature, a transit property can adjust the acceleration rate to fit their operating requirements. Adjusting HyGain downward further increases fuel economy.

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**HyGain™ Performance Chart**

- **HyPerformance™**
  - 0.200 g acceleration

- **Performance**
  - 0.115 g acceleration

- **HyStandard™***
  - 0.100 g acceleration

- **Economy**
  - 0.090 g acceleration

- **HyEconomy™**
  - 0.080 g acceleration

* HyStandard is the default setting.
Easy To Install, **Easier To Maintain**

Allison Hybrid EP System components easily install in T-drive driveline layouts. The drive unit was designed to resemble an Allison Bus Series transmission so maintenance training and repairs are easier. The H 40 EP and H 50 EP share common parts to minimize fleet inventory.

**H 40 EP and H 50 EP Drive Unit**

**Proven Form, Fit And Function**

- Two-mode parallel hybrid operates automatically as a parallel hybrid or series hybrid
- Continuously variable drive with an infinite number of ratios
- Automatically adjusts ratios to operate at optimum power curves to attain best performance and fuel economy

**ESS3 (Energy Storage System)**

The latest Nickel Metal Hydride (NiMH) battery cell technology from PEVE, one of the world’s largest manufacturers of proven nickel metal hydride batteries, is built into this third-generation unit.

- Common, high-capacity hardware to handle every bus size
- Tested innovative technology proven durable and reliable to avoid risks associated with experimental energy storage devices
- No special handling permits required with this battery chemistry
- Allison’s PEVE ESS3 has demonstrated industry-leading reliability in transit and coach applications

**DPIM2 (Dual Power Inverter Module)**

This second-generation unit features more robust internal hardware with enhanced redundancy for greater reliability. Externally, this new unit is fully interchangeable with all prior production units. The unit is now able to be accessed and serviced reducing TCO and repair costs.
Common Allison Electronic Controls

This commercial high-volume, high-quality controller features common hardware to all the latest Allison transmissions and hybrids.

• Greater processing power and memory capability
• Memory expansion allows for further technology evolution
• Fewer electrical connections for greater system durability and reliability
• Full optimization with the latest engines
• Allison HyValue™ performance features HyGain™, HyIdle™ and HyTraction™
• HyGain™ allows OEMs and transit properties to adjust bus acceleration to one of five settings. Lowering the setting reduces acceleration and fuel consumption, as well as engine speed and noise
• HyIdle™ provides higher engine idle speeds at stop automatically. The driver is not required to put the drive system into neutral
• HyTraction™ takes precise control of torque to regain rear wheel traction when it is lost driving in slick conditions, such as ice and snow

ESS Refresh Kit

With this common, cost-effective battery cell replacement kit, there is no need to replace the entire system (ESS2 or ESS3).

• Includes 6-subpack of latest nickel metal hydride battery cells as used in ESS2
• Serviceable for all Allison Hybrid systems produced since 2001
• Optimum for mid-life bus refurbishment
Articulated Bus, Suburban Coach And Transit Bus Specifications

Allison H 40 EP and H 50 EP Drive Unit

Physical Characteristics
Weight: 919 lbs (417 kg) dry, 944 lbs (428 kg) wet
Size: 32 (813) L x 17 (432) W x 12 (305) H* in (mm)

Input

Allison H 40 EP Drive Unit - Transit Bus
Continuous: 280 hp (209 kW)
Rated input torque: 910 lb-ft (1234 Nm)
Rated input speed: 2300 rpm

Allison H 50 EP Drive Unit - Suburban Coach/Articulated Bus
Continuous: 330 hp (246 kW)
Rated input torque: 1050 lb-ft (1424 Nm)
Rated input speed: 2300 rpm

Energy Storage System 3 (ESS3)
Full regenerative braking recovery from 50 mph
Weight: 970 lbs (440 kg)

Dual Power Inverter Module 2 (DPIM2)
430-900 VDC 160 kW continuous 3-phase AC
Weight: 165 lbs (75 kg)

System Controller
Allison Fourth Generation Electronic Controls
Weight: 2.46 lbs (1.12 kg)

Performance
Typical acceleration power with energy storage:
H 40 EP Drive Unit – 240 hp (179 kW)
H 50 EP Drive Unit – 300 hp (224 kW)

Available Engine Options
Cummins B6.7 – 280 hp (209 kW)
Cummins L9 – 280 hp (209 kW) or 330 hp (246 kW)

*Height measured from centerline to sump
The Allison Promise

Provide the most reliable and valued propulsion solutions in the world to enable our customers to work more efficiently.

Quality
Customer Focus
Integrity
Innovation
Teamwork
From our headquarters in Indianapolis, Indiana, USA, to our manufacturing plants in Hungary and India, to approximately 1,400 Allison Authorized Distributors and Dealers around the globe, you are never far from the products, training, service and support you demand.

Our support starts from the moment an Allison transmission is specified. We work with you to ensure that the model and ratings fit your engine to create a tailored package of powerful performance and reliable efficiency. When you need parts or service, you can count on global access to factory-trained specialists and Allison Genuine Parts™.