

HINO *Hybrid* 300 Series



Cleaner, more efficient transport





Hino: World Leader in Commercial Vehicle Hybrid Technology

Hino Motors has sold more than 15,000 Hybrid commercial vehicles worldwide. The new generation Hino 300 Series Hybrid features the world's first Hybrid diesel engine designed exclusively for a commercial vehicle, delivering cleaner, more efficient transport solutions.

Hino: #1 Hybrid Truck Brand

Since its local launch in 2007, the Hino Hybrid range of trucks has been the clear market leader in Hybrid commercial vehicle sales in Australia.



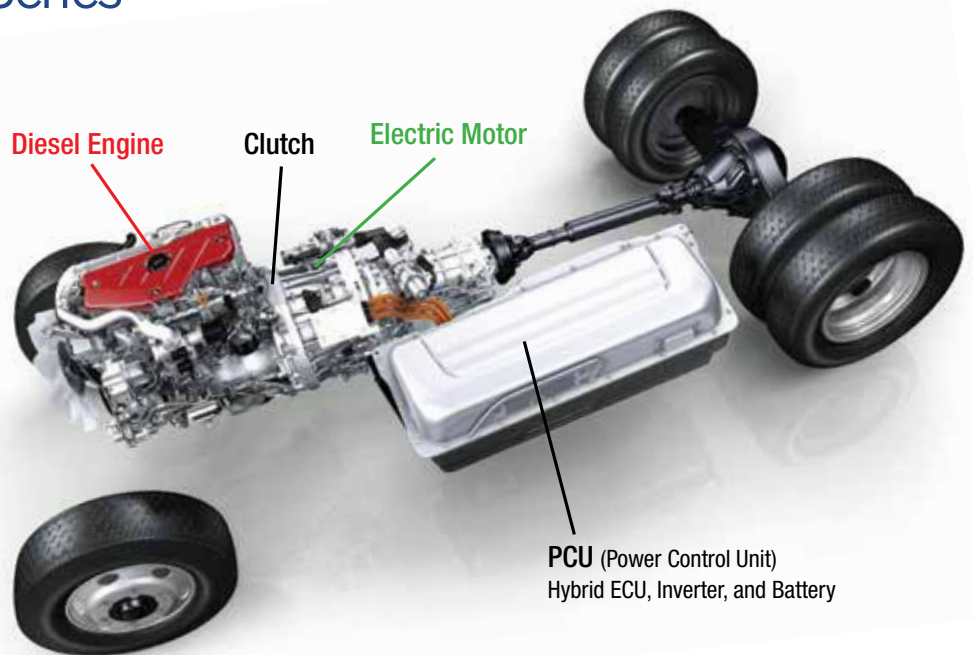
The New Hino 300 Series Hybrid System

Hino has further improved the design of its Diesel Electric Hybrid system to maximise efficiency, reduce fuel consumption and provide owners with a low-maintenance and trouble-free driveline.

The components that support the Hybrid system have been redesigned to reduce weight and take up less space and deliver greater performance.

With the redesigned Hybrid system, Hino has implemented the use of its own ProShift 5 automated manual transmission, and relocated the truck's clutch, placing it between the diesel engine and electric motor. The relocation of the clutch means the truck (under certain circumstances) can now use the electric motor alone to start off from standstill.

In addition, in certain driving circumstances where the accelerator pedal is released, the clutch may be decoupled to maximise the collection of the kinetic energy recovered by the electric generator. As a result energy efficiency is increased and fuel consumption is greatly reduced.





Hybrid Battery

All Hino Hybrid 300 series trucks use a nickel-metal hydride (NiMH) battery for their Hybrid driveline systems. The majority of Hybrid vehicles in the world today use NiMH batteries, and worldwide the same Toyota Group battery technology has been used in over 3 million Hybrid vehicles. Hino's nickel-metal hydride battery has the advantages of:

- Proven reliability, safety and durability, even in high current applications
- Resilience to overcharging
- Low cost
- Long life and maintenance free operation

The Hybrid battery is covered by a Hino factory warranty for 5 years or 160,000km.



Benefits Of A Hybrid Truck

Lower exhaust emissions mean cleaner air. By employing a diesel electric Hybrid system, using an auxiliary electric motor that is emission-free, the Hino Hybrid drive system significantly reduces exhaust tailpipe emissions when compared to a conventional diesel-engined truck.

Compared to a conventional truck the Hino Hybrid emits significantly reduced emissions of:

- Carbon monoxide
- Carbon dioxide
- Particulate matter
- Nitrogen oxide

The Hino Hybrid has the additional benefits of:

- Reduced running costs through greatly improved fuel economy and savings on clutch replacement
- Being easy to service





Driving The Hino 300 Series Hybrid

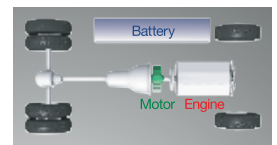
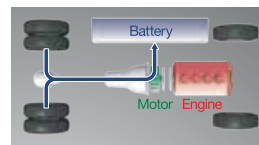
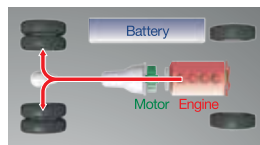
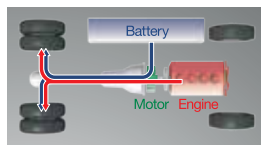
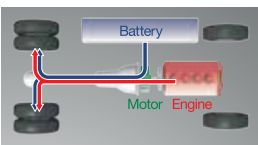
1 Start-Up

2 Acceleration

3 Normal driving

4 Deceleration

5 Idle Stop



Motor Power

When the Hybrid system's battery is sufficiently charged (indicated with battery level 4 and above on the instrument panel), and the Eco mode is selected, the vehicle can move off on electric motor power alone – quietly and smoothly.

The electric motor is also the diesel engine's starter motor. Removing the conventional starter motor reduces weight, which improves fuel efficiency. Fewer parts also means reduced maintenance costs.

Diesel Engine Power + Motor Assist

During take-off and acceleration the electric motor will assist initial movement of the vehicle. The clutch will then engage to couple the diesel engine and electric motor together in a parallel driveline configuration.

The Hybrid system balances the delivery of power and uses the gathered electrical energy stored in the battery pack to supplement the diesel engine's torque.

Diesel Engine Power

While cruising (when the driver is requesting less power from the engine) the diesel engine operates alone to provide drive to the wheels.

A wide torque band ensures the engine runs at optimal efficiency, maintaining low fuel consumption.

Kinetic Energy Recovery

The secret to the success of the Hino Hybrid is that when the accelerator pedal is released (and the exhaust brake is turned off) the clutch disengages, and the electric motor switches to 'generator' mode.

Kinetic energy (that would otherwise be wasted and dissipated as heat energy by the brakes) is converted to electrical energy, and stored in the Hybrid system's battery until required by the electrical motor again.

Diesel Engine Shut Off

With the Auto Stop Start function activated the diesel engine can automatically shut off when the vehicle comes to a stop (providing the brake pedal is depressed).

This function reduces fuel consumption, particularly in stop-start traffic conditions.

When the brake pedal is released the diesel engine automatically starts again, and the vehicle can be driven off. The entire operation is smooth, seamless and intuitive.



Hybrid Reviews



“Hino is the unquestioned leader in Hybrid truck sales in Australia.

“... with the extensive stop-start work that is the mortal enemy of fuel economy, this (Hino Hybrid) truck will cost less to run than most light utes because it captures a large chunk of the energy usually wasted in braking.”

David Meredith, *West Wheels, The Weekend West Australian*, October 2011

“Over the two days spent driving different versions of the 300 Series there was one consistent outcome: the Hybrid outperformed every time when it came to fuel economy, while it behaved similarly in power terms to the diesel alternative.

“So, as you look at the Hino 300 Series, consider several important factors... The use of Hybrid technology for an inner urban distribution or collection system will cut your emissions and your fuel use... the more you use it, the more you save.”

Chris Mullett, managing editor, *Power Torque* magazine, December/January 2012

“One of the best parts about the new Hybrid is the five-speed automated transmission. Better yet, the driver doesn't have the hassle of working a manual box and the boss gets some fuel savings because it doesn't get over-revved, and switches off at idle.

“...the new Hino Hybrid is a much-improved truck that makes saving fuel far easier than before.”

James Standford, *Cars Guide*, November 2011

“To their enormous credit, Hino has persevered with their Hino Hybrid technology ... and now offer no less than eight Hybrid models, featuring a new parallel Hybrid system promising increased performance and a new AMT (automated manual transmission).

“In another light-duty truck safety first, high intensity discharge (HID) headlamps on wide cab models are available as standard equipment on Hino Hybrid.

“Having spent a couple of days driving most examples of the 300 Series – including the too-often-overlooked Hybrid – I have to agree. The 300 Series is good.”

Geoff Paradise, editor, *Transport & Trucking Today*, January 2012



All-Round Driveability

There are two key factors that contribute to the Hino 300 Series Hybrid's outstanding fuel efficiency and all-round driveability:

1. Effective recovery of kinetic energy that would otherwise be wasted as heat energy by the conventional disc brake system
2. The diesel engine's torque delivery and diesel fuel usage being efficiently substituted by the electric motor, utilising the electric energy stored in the Hybrid system's battery in place of diesel fuel.

Clutchless Operation

The Hino Hybrid 300 Series has no clutch pedal. The ProShift 5 automated manual transmission employs an electronic control unit to control the changing of gears and operation of the clutch.

When driven in the Drive (D) mode, the vehicle can be driven like a conventional automatic-transmission truck (easy two-pedal operation). In this mode gear changes are executed in accordance with driving conditions and Hybrid system mode settings.

The operation of the Hybrid drivetrain is optimised in this mode, contributing to significant fuel consumption savings.

Drivers may also select S (Sequential) mode, should they wish to select gears manually to suit their driving style, or to hold gears in circumstances such as long steep descents (requires low gear selection).

Hino's ProShift AMT has been designed so that it is easy to drive, requires low maintenance, and provides long service life.



Eco Driving – Optimised Efficiency

Instrument Panel

Drivers are continuously informed of the vehicle's status and eco-performance via the conveniently positioned instrument panel and indicators.



Hybrid indicator

Lets the driver know the charge/assist status of the system.



Eco light

Changes to green to indicate to the driver they are driving efficiently.



Multi information monitor

Turns green during eco-driving.

Hybrid Driving Efficiency

Driving a Hino Hybrid is no different to driving a standard diesel truck. The following tips will help achieve maximum efficiency:

- During take off press the accelerator pedal down gradually
- Try to keep the pressure on the accelerator constant
- Try to keep the green ECO light lit as much as possible
- When decelerating, lift your foot off the accelerator pedal as soon as possible
- When bringing the vehicle to a stop, avoid using the foot brake as long as it is safe
- Use the Idle-Stop function as much as possible

Servicing

To reduce maintenance costs and make operating your Hino more efficient for owners, the new generation 300 Series Hybrid trucks have exactly the same regular service intervals and in-workshop service times as Hino's conventional diesel-engine trucks.

The new generation Hybrid system has the following key service features:

- The main electrical components (the motor, inverter and nickel-metal hydride battery) are maintenance free
- Identical service costs to Hino's conventional 300 Series diesel-engine light duty truck
- Regular service intervals of 20,000km, the same as Hino's conventional 300 Series diesel-engine light duty truck
- The same grade and quantity of engine oil, as well as the same filters, as Hino's conventional 300 Series diesel-engine light duty truck





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Expanded Model Range

Standard Cab

With a convenient, efficient layout, the Standard Cab features an elevated seat position and design for navigating tight spaces.



Wide Cab

The remodeled Wide Cab offers an intelligent, ergonomic package, in order to answer the needs of city operations.



Key Specifications

Diesel Engine: 4.0-litre, Common Rail, Direct Injection, Turbocharged and Intercooled; **Power:** 110kW @ 2500 RPM (ISO NET); **Torque:** 420Nm @ 1400 RPM (ISO NET); **Electric Motor:** 300 Volt AC Synchronous Motor; **Max electric output:** 36kW; **Max Torque:** 333Nm; **Battery Type:** Nickel-metal hydride; **Battery capacity:** 288V/6.5Ah; **Transmission:** five-speed ProShift Automated Manual Transmission (AMT)

STANDARD CAB	WIDE CAB
616 HYBRID IFS (STANDARD CABIN)	616 HYBRID (WIDE CABIN)
GVM: 4495kg, optional 5500kg	GVM: 4495kg, optional 5500kg
GCM: 7795kg, optional 9000kg	GCM: 7995kg, optional 9000kg
Wheelbases: Short 2800mm Medium 3400mm	Wheelbases: Medium 3430mm Long 3870mm
Nominal Max Body length: Short 3900mm Medium 4860mm	Nominal Max Body length: Medium 4840mm Long 5550mm
	716 HYBRID (WIDE CABIN)
	GVM: 6500kg, optional 4495kg
	GCM: 10,000, optional 7995kg
	Wheelbases: Medium 3430mm Long 3870mm
	Nominal Max Body length: Medium 4840mm Long 5550mm
	916 HYBRID (WIDE CABIN)
	GVM: 7995kg, optional 8500kg
	GCM: 11,500kg, optional 12,000kg
	Wheelbases: Medium 3430mm Long 3870mm
	Nominal Max Body length: Medium 4840mm Long 5550mm

Warranty

Standard warranty – 3 years or 100,000km (whichever comes first)

Cab corrosion perforation – 36 months

Nickel Metal Hydride battery pack – 5 years or 160,000km (whichever comes first)

Engine Battery warranty – 12 months from date of delivery

For further information call 1300 014 466 or visit www.hino.com.au

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