

MACK POWERTRAIN



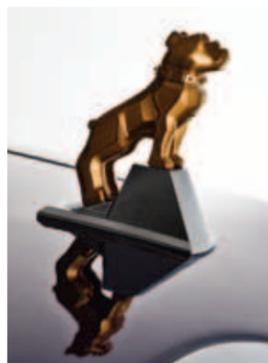
# MACK® POWER

## INTEGRATED PEDIGREE™ POWERTRAINS DRIVE PERFORMANCE

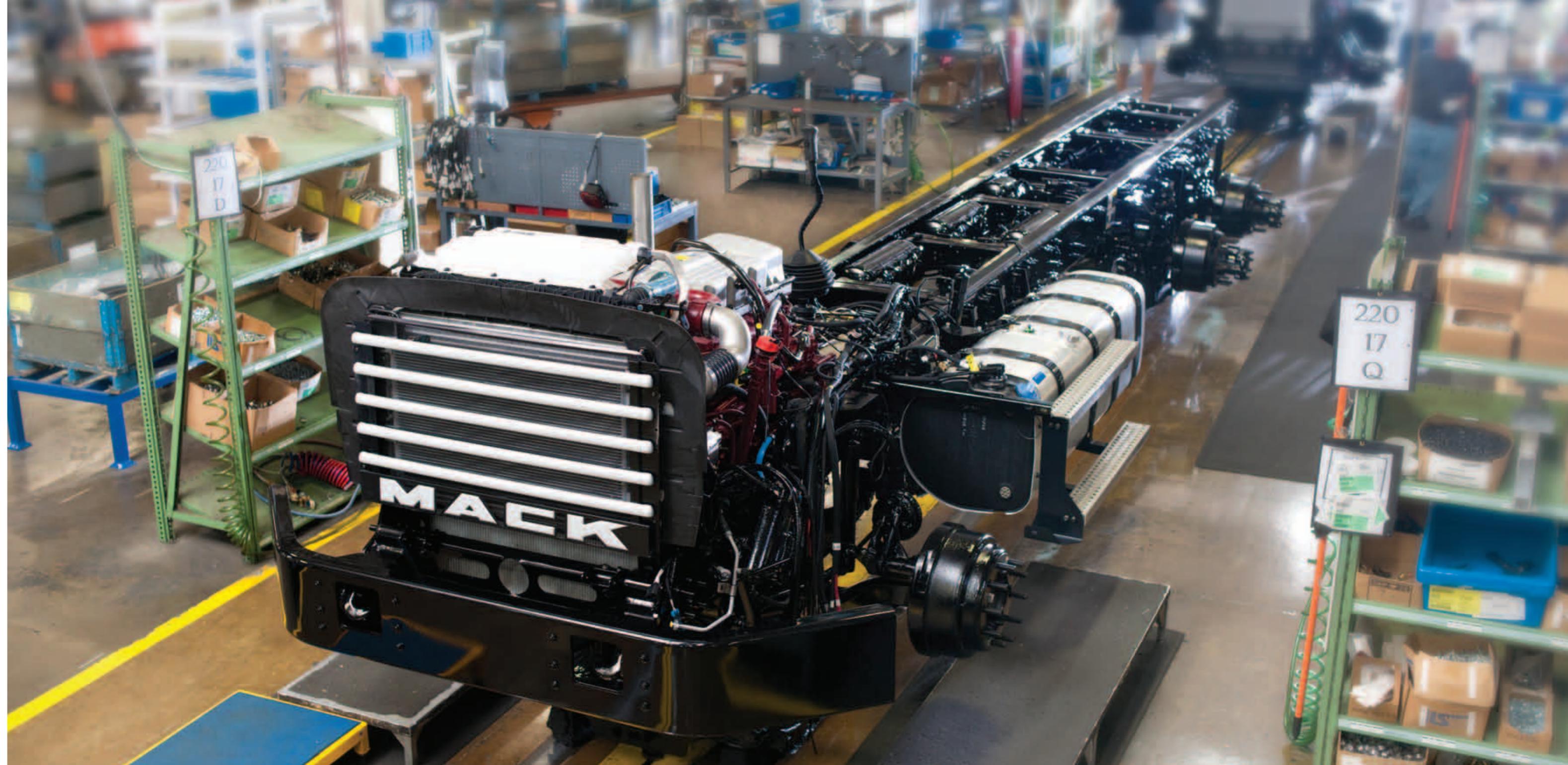
The reputation earned by Mack Trucks, Inc., for building dependable, trusted workhorses has been established by more than a century of manufacturing milestones. The phrase Built Like A Mack Truck® signifies the strength, durability and unbreakable spirit of every Mack truck.

As America's first integrated truck and engine manufacturer, we're the only OEM to practice balanced design principles, which assures all components function perfectly with each other. And the heart of every Mack truck is driven by our integrated powertrains — engines, transmissions, axles and electronics that perform optimally because they're specially designed and manufactured to work together.

The result of our balanced design principles — building the cab, chassis and complete powertrain — is better performance, increased fuel efficiency and lower maintenance costs. And those benefits mean lower operating costs, better resale value and increased profits.

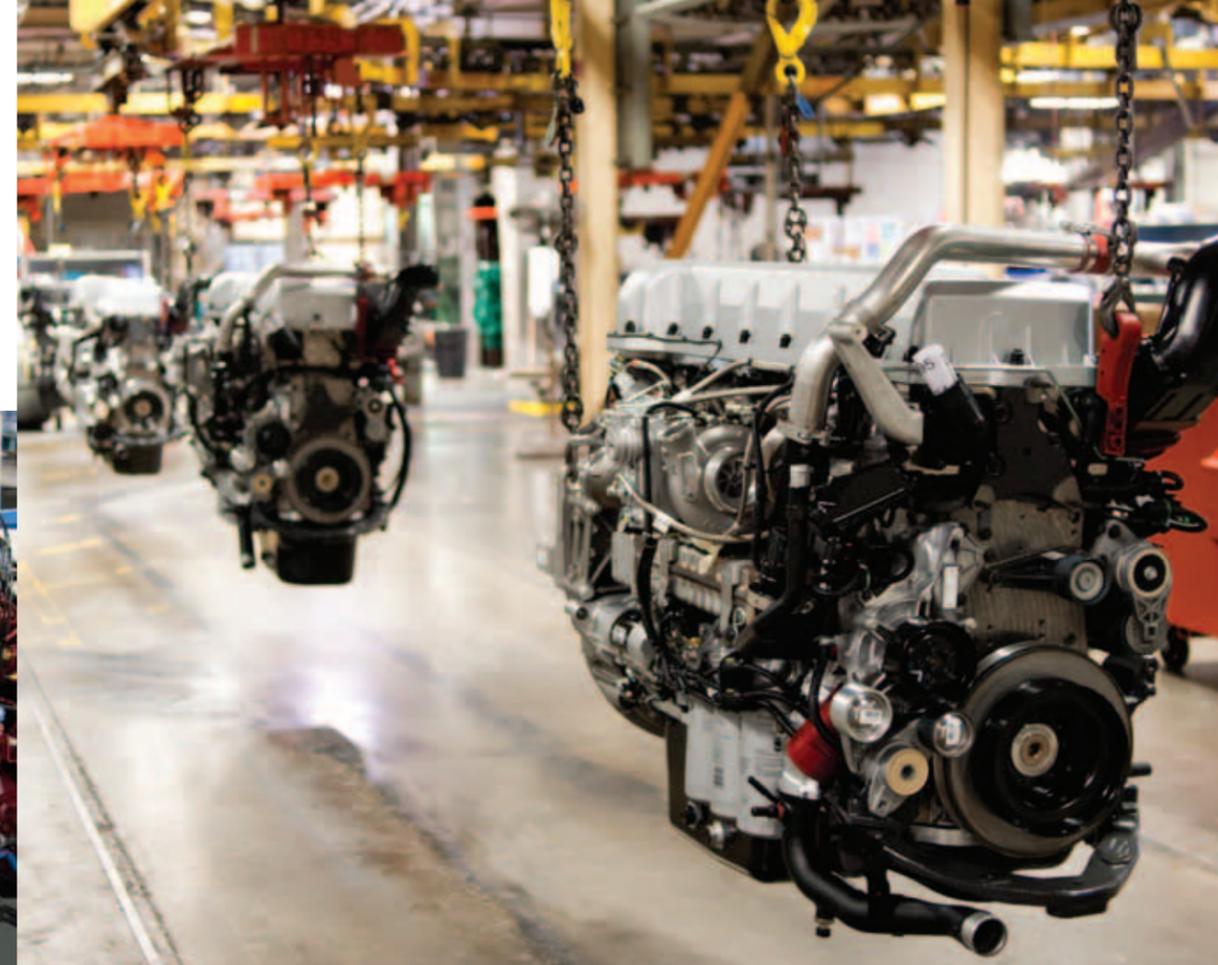


**THE GOLD-PLATED MACK BULLDOG®  
HOOD ORNAMENT REPRESENTS A MACK  
TRUCK BUILT WITH A 100 PERCENT  
MACK PEDIGREE POWERTRAIN**



# THESE ENGINES ARE ALL MUSCLE

The Mack® MP™ Engine Series impresses mile after mile. These proven, highly fuel-efficient and clean-running engines feature an amazing horsepower range from 325 to 605 HP. And with torque ratings topping out at a phenomenal 2,060 lb.-ft., these engines deliver plenty of muscle and the low-end torque you need to conquer the workday.



**BOOST POWER AND FUEL EFFICIENCY:** The Econodyne engines use an intelligent torque management strategy called EconoBoost to give drivers the extra muscle needed to keep vehicle speed constant under full engine loads to avoid downshifts. Initiating at 1,300 RPM with the driver maintaining speed for three seconds of full throttle (while in the top two gears), EconoBoost provides up to an additional 200 lb.-ft. of torque for as long as needed, allowing the engine to stay in a higher gear to crest a hill or make a safe pass. EconoBoost delivers more than 90 percent of power after an upshift, and it disengages once the driver lifts off the throttle and the driveline senses zero torque.

Because EconoBoost provides torque at lower RPMs and not just horsepower at higher RPMs, it can optimize fuel economy by an additional 1.5 percent. As a result, drivers get more torque at low engine speeds for improved fuel efficiency and superior hill pulling performance along with reducing driveline stress. All Mack Pinnacle™ highway tractors can be configured with Econodyne engines in either the Mack MP7 and MP8 engines.

**EASY SERVICING:** The MP Engine Series features 35,000-mile service intervals for highway trucks and 450-hour or 15,000-mile oil drain intervals (whichever comes first) for vocational applications. These engines are designed with convenient access points that make servicing a snap.

**SINGLE OVERHEAD CAM:** This MP Engine Series uses a robustly designed single overhead camshaft that reduces stress and incorporates an ultra-high-pressure fuel injection system.

**VARIABLE GEOMETRY TURBOCHARGER:** The electronically controlled Variable Geometry Turbocharger incorporates the latest technology to control turbo boost at all RPM ranges and engine loads. Mack provides additional cooling and lubricant for the turbo and actuator.

**BUILT LIKE A MACK TRUCK®:** The MP Engine Series is designed with fewer parts, including one-piece steel pistons and stronger bearings and cylinder heads, giving operators a true powerplant that's built to last.

**A BRAKE POWERFUL ENOUGH TO STOP A MACK:** The Mack PowerLeash™ engine brake provides more braking horsepower through mid-RPM ranges, and weighs 50 pounds less than competitive engine brakes. It is fully integrated with the MP Engine Series, and with better braking over the entire speed range, PowerLeash delivers the most retarding horsepower ever in a Mack engine brake. Drivers will immediately notice the responsiveness of the near-instantaneous engine braking, giving drivers confidence behind the wheel. For trucks with the Mack *mDRIVE*™ automated manual transmission, PowerLeash can be programmed to work with the *mDRIVE* to automatically downshift to maximize brake retarding effort.

**MAXIMUM PERFORMANCE:** Offered in three engine families — Econodyne®, MaxiCruise® and Maxidyne® — the MP Engine Series is tailored to fit your applications. The Econodyne engines are ideal for typical interstate applications with extended times at engine cruise speed with part load/part throttle applications where fuel economy is a priority. The MaxiCruise engines perform best on rolling interstates and in on/off road applications. The Maxidyne engines provide high power for low-speed, high-performance and severe-duty conditions, especially in off-road applications.





## ELECTRONICS THAT BOOST PRODUCTIVITY

The fourth generation of the time-tested and road-proven Vehicle Management and Control System (V-MAC® IV) gives you greater control over your costs and lets you manage your truck and engine better than ever. This advanced system features more than 100 proven programmable features that include standard multi-level MPH sensor tamper detection, integrated starter protection, as well as many comprehensive fuel economy settings and a host of other options. V-MAC IV electronics comes with DataMax™, an advanced trip recorder that captures vehicle trip histories, duty cycle information and scheduled maintenance intervals. V-MAC IV allows fuel economy settings and vehicle parameters to improve your bottom line.



## GUIDING YOU TOWARD GREATER PROFITABILITY

Mounted high and centered in the dash for easy reading, the standard large-display Co-Pilot™ driver information system sets the industry standard. Drivers can easily toggle through information screens with a four-button steering-column stalk. This innovative display has over 50 screens that provide real-time fuel economy and trip data, detailed maintenance and fault summaries, and supplemental sensor readings. Co-Pilot allows you to equip your truck with specialized features like the Mack Fuel Economy Incentive Program and GuardDog™.



The MP7 engine is powerful and lightweight to maximize payloads. This 11-liter engine has an amazing power-to-weight ratio with a horsepower range from 325 to 405 HP and torque ratings from 1,200 to 1,560 lb.-ft.

This lightweight engine is ideal for weight sensitive applications, helping you boost payload when used with our Granite® and Pinnacle™ models. The MP7 engine is also well suited for refuse applications and is outfitted in all TerraPro™ models.



**MAXIDYNE®**

ENGINE	HP
MP7	325M
MP7	365M
MP7	405M
ENGINE TORQUE LEVELS MP7: 1,200–1,480 lb.-ft.	

**MAXICRUISE®**

ENGINE	HP
MP7	345C
MP7	365C
MP7	395C
ENGINE TORQUE LEVELS MP7: 1,360–1,560 lb.-ft.	

**ECONODYNE®**

ENGINE	HP
MP7	325E
MP7	355E
MP7	405E
ENGINE TORQUE LEVELS MP7: 1,260–1,460 lb.-ft.	

**REFUSE**

ENGINE	HP
MP7	345R
ENGINE TORQUE LEVEL MP7: 1,280 lb.-ft.	





The MP8 engine provides the muscle to shoulder heavy workloads. This 13-liter engine has a horsepower range from 415 to 505 HP and torque ratings from 1,460 to 1,760 lb.-ft. This engine achieves a maximum power density of up to 38.8 HP/liter. This allows the MP8 (505 HP) to weigh several hundred pounds less than a 15-liter engine at an equivalent horsepower.

The MP8 engine, available in Granite®, Pinnacle™ and select TerraPro™ models, provides plenty of confidence as it delivers extra brawn for heavy-duty vocational and highway applications.



MAXIDYNE®	
ENGINE	HP
MP8	425M
MP8	455M
MP8	505M
ENGINE TORQUE LEVELS MP8: 1,570–1,760 lb.-ft.	

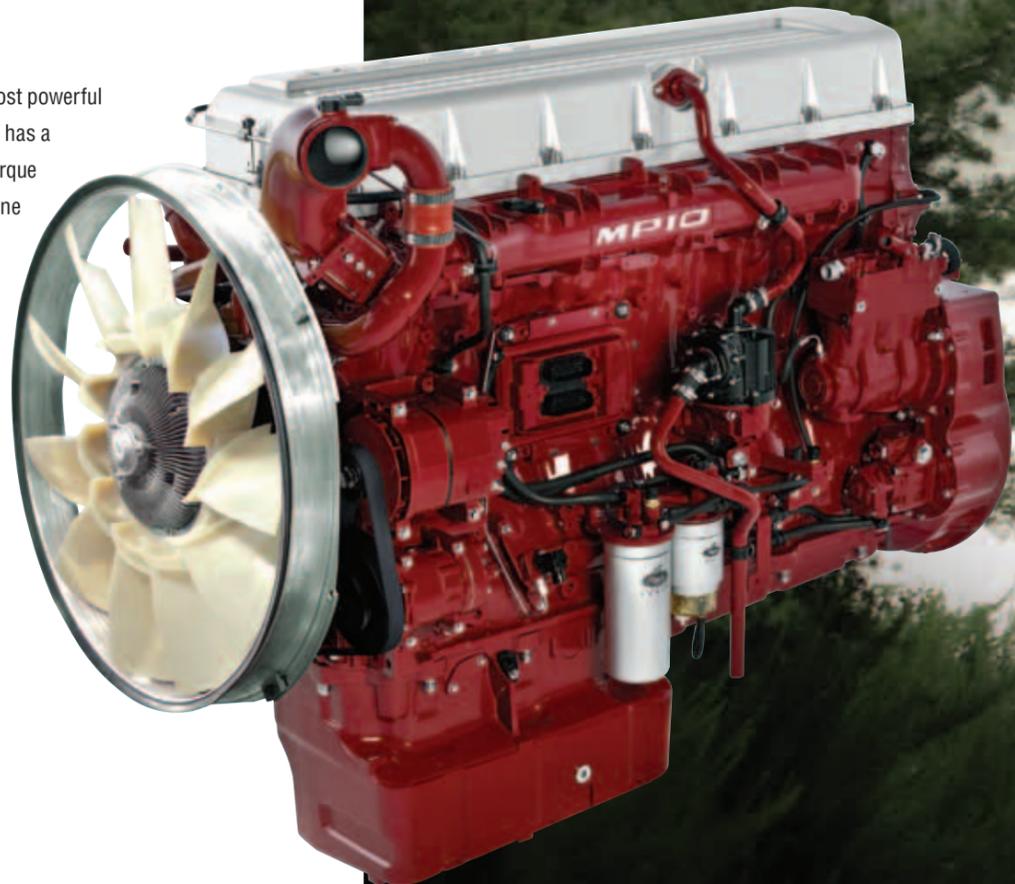
MAXICRUISE®	
ENGINE	HP
MP8	415C
MP8	445C
MP8	505C
ENGINE TORQUE LEVELS MP8: 1,660–1,760 lb.-ft.	

ECONODYNE®	
ENGINE	HP
MP8	415E
MP8	445E
MP8	505E
ENGINE TORQUE LEVELS MP8: 1,460–1,760 lb.-ft.	



The 605-horsepower, MP10 engine is the most powerful engine we've ever built. This 16-liter engine has a horsepower range from 515 to 605 HP and torque ratings from 1,860 to 2,060 lb.-ft. This engine delivers high horsepower while putting low stress on the engine with a power density of 37.8 HP/liter.

Built exclusively for the Titan by Mack, the MP10 engine boasts best-in-class torque ratings. And thanks to its impressive engine, Titan shines in logging, oil field, coal, heavy equipment, special-permit and severe, heavy-haul applications.



**MAXIDYNE®**

ENGINE	HP
MP10	515M
MP10	555M

ENGINE TORQUE LEVELS  
MP7: 1,960–2,060 lb.-ft.

**MAXICRUISE®**

ENGINE	HP
MP10	515C
MP10	565C
MP10	605C

ENGINE TORQUE LEVELS  
MP7: 1,860–2,060 lb.-ft.



# AN AFTERTREATMENT SYSTEM THAT WAS NO AFTERTHOUGHT

As an industry leader in engine development, Mack® remains at the forefront of engine development, incorporating selective catalytic reduction (SCR) technology into our MP™ engine platform. The Mack ClearTech™ SCR System — the first to be certified by the EPA — creates clean-running and fuel-efficient engines that boast near-zero emissions to meet strict EPA'10 standards. Already used successfully in hundreds of thousands of trucks around the world, SCR is the proven, reliable approach.

## HOW THE CLEARTECH SCR SYSTEM FITS

When incorporating SCR technology into the MP Engine Series we were careful to configure the system without impacting normal daily operations. As outlined below, the compact design allows for easy integration without altering the cab or chassis.



### DIESEL EXHAUST FLUID (DEF) TANK

On the driver side of the truck, the DEF tank (blue cap) is tucked between the cab steps and the fuel tank. This placement is convenient for refilling operations.



### SCR CATALYST

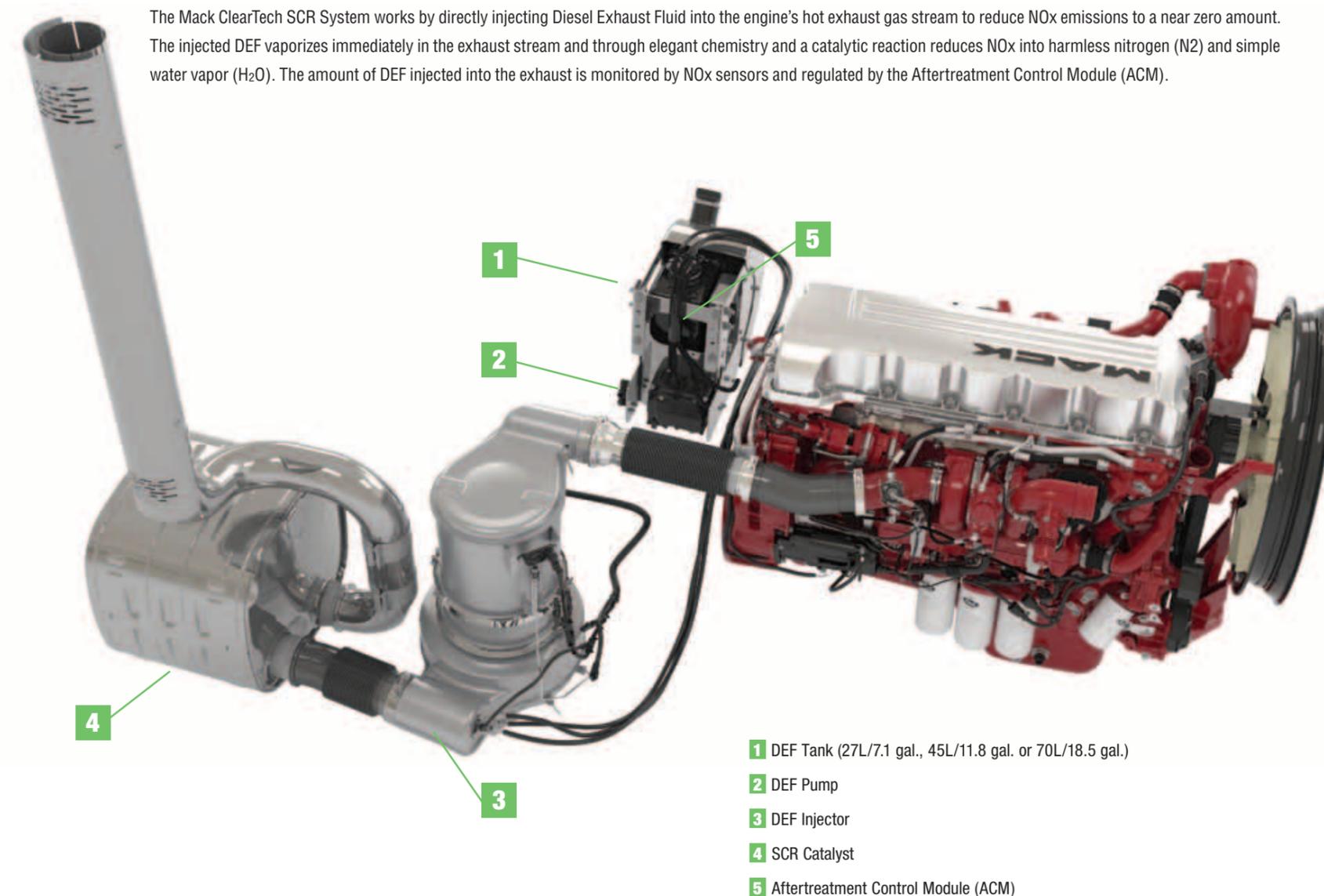
The passenger side of the truck houses the catalytic conversion chamber that sits behind the Mack Cap DPF (under the steps). It is positioned just behind the cab and along the frame rail.

**CLEANING UP THE STREETS:** We seamlessly incorporated a Diesel Particulate Filter (DPF) into the exhaust system of all our trucks with a technically savvy solution to meet emissions requirements. The catalyzed design of our DPF system allows the use of passive exhaust heat to oxydize the collected soot, virtually eliminating the need of an active (diesel fuel supported) DPF regeneration, in all highway and most vocational applications. All TerraPro™ models are equipped with a semi-catalyzed thermal regeneration DPF unit which is designed to work flawlessly with the stop-and-go activity of refuse trucks. This unique, industry-specific solution significantly reduces the need for active DPF regeneration. When needed, the DPF automatically initiates thermal regeneration while you work. The result saves time, money and improves the efficiency of your workforce.



## HOW THE CLEARTECH SCR SYSTEM WORKS

The Mack ClearTech SCR System works by directly injecting Diesel Exhaust Fluid into the engine's hot exhaust gas stream to reduce NOx emissions to a near zero amount. The injected DEF vaporizes immediately in the exhaust stream and through elegant chemistry and a catalytic reaction reduces NOx into harmless nitrogen (N<sub>2</sub>) and simple water vapor (H<sub>2</sub>O). The amount of DEF injected into the exhaust is monitored by NOx sensors and regulated by the Aftertreatment Control Module (ACM).

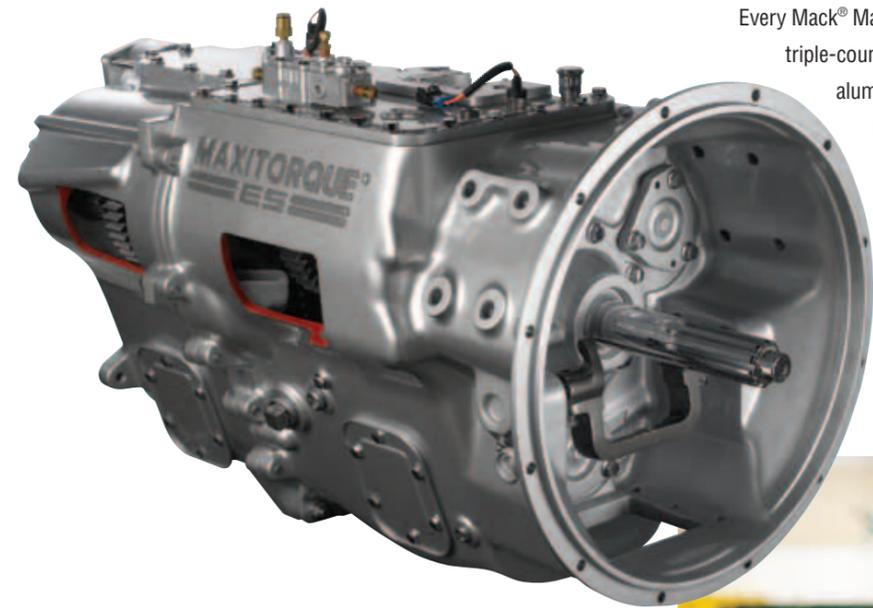


- 1 DEF Tank (27L/7.1 gal., 45L/11.8 gal. or 70L/18.5 gal.)
- 2 DEF Pump
- 3 DEF Injector
- 4 SCR Catalyst
- 5 Aftertreatment Control Module (ACM)

# OUR TRANSMISSIONS LEAD THE WAY

Every Mack® Maxitorque® ES transmission is designed to deliver superior performance. With the industry's only triple-countershaft design; revolutionary shifttable, multi-speed reverse capabilities; standard, one-piece aluminum casings; and more PTO mounting options than any other transmission; Mack Maxitorque transmissions are a breed apart.

And since Mack is the only truck manufacturer offering the benefits of integration and single-source accountability for the engine, transmission and chassis, you not only get the industry's best-built transmission, you get peace of mind knowing all Mack transmissions are engineered to work in concert with the engine to create powerful, reliable powertrains.



## UNMATCHED DESIGN. SUPERIOR PERFORMANCE.

Mack offers the only transmission with a unique triple-countershaft design that disperses load between three shafts versus two. Because there are three countershafts rather than only two, each countershaft carries 33 percent of the load rather than 50 percent (17 percent less load per countershaft). This design reduces gear face friction, improving fuel economy. With only one gear immersed in oil rather than two as in competitive units, the result is more efficient operation, as the parasitic loss in churning oil is cut in half. In turn, this passes more horsepower through the transmission rather than allowing it to be lost. Synchronized versions (9, 10 and 18-speed) provide nine times the synchronized area of the competition.



## MOVING FORWARD EVEN IN REVERSE

Mack offers an exclusive shifttable, multi-speed reverse functionality that allows for precision off-road driving. Lo and lo-lo ratios allow for exceptional maneuvering and slow high power speed control.

## SMOOTH OPERATOR

The Easy Shift, light-touch design and shift rail profile of our transmissions allow for smooth transitions through the neutral gate with each shift. Sliding clutches permit quicker, smoother shifts while increasing durability. A tighter ergonomic shift pattern is easy on drivers for improved comfort.

## THE POWER TO HAUL THE HEAVIEST LOADS

Mack Maxitorque transmissions provide more PTO mounting options than any other transmission. And with ratings up to 2,100 lb.-ft., the Mack family of transmissions delivers the right torque for instantaneous pulling power. Our T300 series confirms Mack as the undisputed vocational leader where demanding tasks require specific needs. With 19 different models and 6 to 18 speeds, there's a Maxitorque ES transmission to fit any application.

## COOL UNDER PRESSURE

Mack is the only manufacturer to provide standard, a one-piece aluminum case that's lightweight and stays cool. The aluminum case of the Mack Maxitorque transmissions provides a "built-in-cooler." Typical iron-cased transmissions do not exchange heat as efficiently.



## ENHANCED PERFORMANCE FOR PINNACLE™ MODELS

With the all-new Mack® *mDRIVE*™ transmission built exclusively for Pinnacle tractors, you can now get a complete Mack Pedigree™ Powertrain in an automated manual transmission. This 12-speed, two-pedal transmission maximizes driver comfort, payload and fuel economy. The *mDRIVE* includes an impressive base torque input capacity of 1,920 lb.-ft. and is offered with Direct Drive or Overdrive.

The *mDRIVE* is designed to integrate seamlessly with the Mack MP7 and MP8 engines in the Econodyne® and MaxiCruise® families. There's no clutch pedal, and the gearshift is operated by an intelligent shift pad module and managed by sophisticated electronics. Any Pinnacle specified with an *mDRIVE* automated manual transmission not only delivers smooth shifts every time, but is also able to be operated by a larger pool of drivers.

Featuring advanced technology, *mDRIVE* continuously monitors changes in grade (both up and down), vehicle speed, throttle position, acceleration, torque demand and combined vehicle weight. With the engine and transmission in constant communication, there's just no compromising. *mDRIVE* automatically selects the best gear for optimized fuel economy at the desired road speed. This puts less stress on the driveline, for longer life and less wear. The *mDRIVE* is based on proven technology that requires minimal service and significantly reduced maintenance.

The *mDRIVE* transmission features Mack's industry-leading, two-speed reverse functionality that better controls speed and engine RPMs. The *mDRIVE* is also available with single and dual rear transmission PTO mounting options.



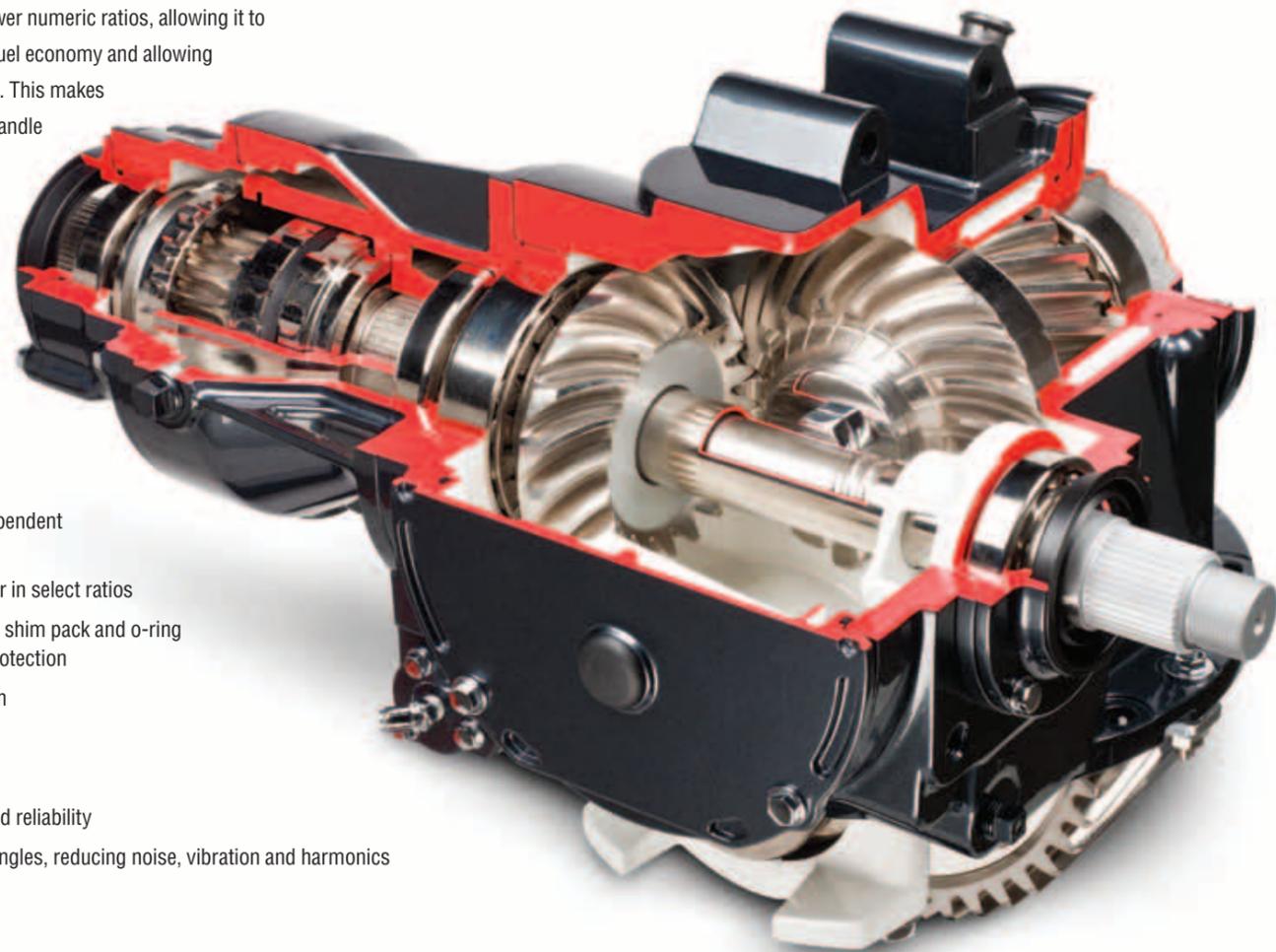
# BUILT FOR INCREASED RELIABILITY

Mack® axles and carriers are the foundation upon which the Mack reputation for ruggedness, productivity and dependability is built. And the next evolution — the new Mack C150/151 Axle Carriers — will only build on that Bulldog® tough legacy.

The C150/151 Axle Carriers deliver improved efficiency, higher ratings, improved durability and quieter operation. They are engineered with new lower numeric ratios, allowing it to run at reduced RPMs while at cruise speeds, boosting fuel economy and allowing the engine to run much closer to the lower peak torques. This makes it ideal for highway applications. They are designed to handle the relentless punishment of demanding vocational operations and are rated for severe-duty applications. The C150/151 Axle Carriers also offer a single drive axle to accommodate the highway market.

## MACK C150/151 AXLE CARRIERS FEATURE

- Standard Mack Inter-Axle Power Divider with an optional Power Divider Lockout
- Optional Driver Controlled Differential Lock with independent or joint control for improved traction
- Available with an automatic Inter-Wheel Power Divider in select ratios
- A patent-pending sealing package for the bevel pinion shim pack and o-ring seals that integrate throughout for superior oil leak protection
- Patented symmetric front and rear hollow bevel pinion
- Larger tapered roller bearings throughout
- Premium bearing materials
- Triple-lip seal on rear carriers and singles for improved reliability
- Top-loaded carrier design allows near zero driveline angles, reducing noise, vibration and harmonics



## DELIVERING HEAVY-DUTY SUPPORT

The Mack C150/151 Axle Carriers are an important component of the Mack integrated Pedigree™ Powertrains, performing optimally because they're designed and manufactured to work together with the engine, transmission, axles and electronics.

The Mack standard dual-reduction, top-mounted feature of these new carriers provides Bulldog-tough, double-reduction through two sets of gears, not just a single reduction, which significantly reduces stress and gear face pressures through the carrier. Also because of the top-loading feature, Mack has reduced driveline angularity to an absolute minimum, which greatly reduces noise, vibrations and harmonics. This provides a quieter, smoother ride and longer input seal life. With the carriers mounted horizontally, there is no vertical joint, significantly reducing axle lube leak paths, which is a major source of gear wear and potential failure.

Mack spiral bevel gears provide “rolling friction” rather than the sliding friction normally associated with “hypoid” gears. The efficiencies involved with rolling an object rather than sliding it results in a reduction in frictional power loss. The Mack carriers incorporate a full-time power divider, which biases torque to the axle that has the greater amount of traction. An optional Power Divider Lockout is available for on/off road ice and snow conditions.

Typical competitive axles use a conventional differential with a lockout device. This differential reacts much like the differential on a passenger car. As a competitor's axle loses traction, all of the power is transferred to the axle and the vehicle becomes immobile. If the differential lockout is utilized to restart the vehicle and not disengaged when returning to normal traction surfaces, expensive damage may occur.



## DRIVER AXLES BUILT TO LAST

You want drive axles that last, require little maintenance and minimize unexpected downtime. The S40 Series fills all those needs. Its housing is made from fabricated steel to effortlessly handle heavy loads up to 44,000 lbs. — an ideal choice for highway applications. The S40 axle housings have tighter tolerances and fewer weld joints for greater reliability and longer life. The bowl cover is a one-piece, seamless design that integrates into the housing rather than a separate welded-on piece for more durability and less leak paths. Also, dirt and debris can't get inside to damage components.

Mack has strengthened suspension joint clamp integrity on the S40 Series. The corners are squared off minimizing compression to form a tighter, longer-lasting connection. Suspension brackets use set screws and are then welded in place to boost bracket-to-axle weld joint integrity. The S440 is ideally engineered as a lighter alternative for heavy-duty use at 44,000-lb. capacity. R-Series industry-standard wheel ends are used on both axles so wheel end bearing and brake compatibility is virtually ensured.

## CLOSE TO INDESTRUCTIBLE

The S46 is a premium drive axle made of cast ductile iron and carries loads rated to 46,000 lbs. This severe-duty workhorse saves weight by casting thicker reinforcing to only the parts that take the brunt of the load. The S46 is the strongest 46,000-lb. axle we've ever built.



## TOP-NOTCH PROTECTION

We support our trucks with a base warranty of 2 years/250,000 miles, and Bulldog® Extended Protection Plans are available to provide you with the most extensive, flexible warranty coverage in trucking.

### SUPPORT FROM COAST TO COAST

We promise the industry's best customer experience with more than 300, state-of-the-art Mack® dealers, many conveniently located near major interchanges for easy-on, easy-off access. Our expansive, coast-to-coast dealer network communicates seamlessly with our eight Parts Distribution Centers for real-time inventory access to ensure 24-hour parts delivery anywhere in North America.

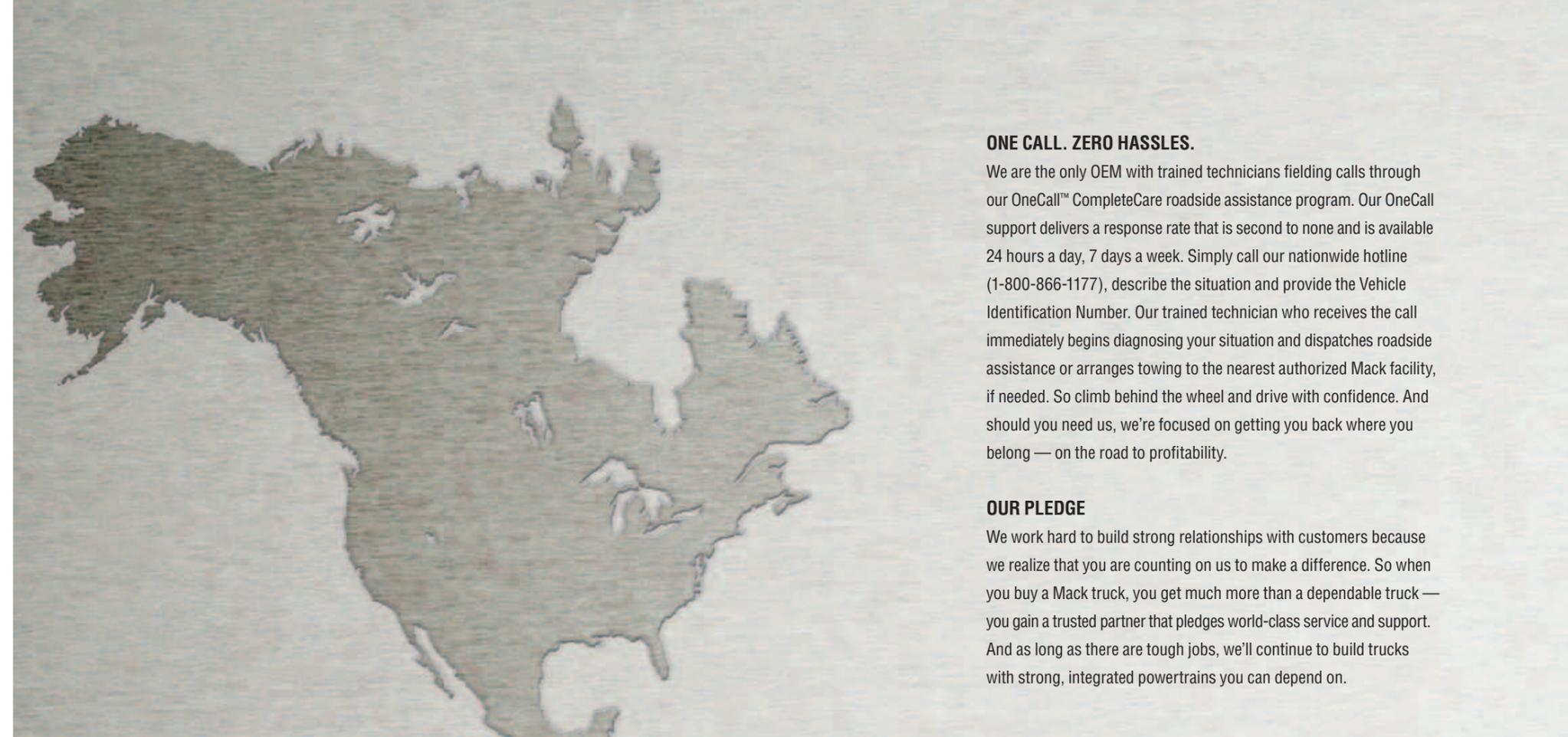


### ONE CALL. ZERO HASSLES.

We are the only OEM with trained technicians fielding calls through our OneCall™ CompleteCare roadside assistance program. Our OneCall support delivers a response rate that is second to none and is available 24 hours a day, 7 days a week. Simply call our nationwide hotline (1-800-866-1177), describe the situation and provide the Vehicle Identification Number. Our trained technician who receives the call immediately begins diagnosing your situation and dispatches roadside assistance or arranges towing to the nearest authorized Mack facility, if needed. So climb behind the wheel and drive with confidence. And should you need us, we're focused on getting you back where you belong — on the road to profitability.

### OUR PLEDGE

We work hard to build strong relationships with customers because we realize that you are counting on us to make a difference. So when you buy a Mack truck, you get much more than a dependable truck — you gain a trusted partner that pledges world-class service and support. And as long as there are tough jobs, we'll continue to build trucks with strong, integrated powertrains you can depend on.





BUILT LIKE A MACK TRUCK®

FOR MORE INFORMATION, CALL 1-800-922-MACK (6225) OR VISIT [MACKTRUCKS.COM](http://MACKTRUCKS.COM)

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