ALL-NEW MAZDA CX-9 THREE-ROW CROSSOVER DEBUTS AT 2015 LOS ANGELES AUTO SHOW

CX-9 OFFERS ELEVATED EXPERIENCE WITH INNOVATIVE TECHNOLOGIES, NEW SKYACTIV-G 2.5T ENGINE AND PREMIUM, AUTHENTIC MATERIALS

When the Mazda CX-9 made its world debut back in 2006, it was an epiphany: A midsize three-row crossover SUV that defied the conventional design cues and cumbersome driving experience expected of vehicles in its class. Despite being a large vehicle, CX-9 is, after all, still a Mazda. CX-9 quickly captivated the automotive industry, winning numerous accolades.

Now comes the encore: the latest, grandest expression of KODO—Soul of Motion design yet and the high-end model of Mazda's new-generation lineup. Its cachet is elevated with a proud front fascia that cascades into crisp lines that flow to the rear. Its interior is nothing short of breathtaking, with available Auburn-colored Nappa leather, Japanese rosewood and aluminum. The focus was on authenticity; an experience rather than simply another commodity conveyance.

With the new CX-9, engineers sought to instill driving dynamics befitting of a Mazda—agile handling, tight steering and a responsive, controllable powertrain. To do this, they found smart solutions to keep CX-9's structure light, yet rigid, with SKYACTIV Technology. They developed a new turbocharged SKYACTIV-G 2.5T engine that delivers instant throttle response, class-leading torque and an estimated around 20-percent increase in fuel- efficiency, based on initial estimates of U.S. EPA testing cycles, making CX-9 among the most efficient vehicles in its class.

Just as CX-9 did nine years ago, the second-generation redefines expectations, aiming for no other target than to be uncompromising in any aspect a family may need or an individual may desire.

CX-9 Values

When developing the 2016 Mazda CX-9, Mazda's marketing, design and engineering teams surveyed hundreds of previous, current and in-market drivers, developing a vision of how to focus its efforts to create a vehicle around the personal values of those driving it.

The driver of CX-9 was seen to be a caring husband or wife, a high-achiever, a busy parent—and, still, an individual with his or her own needs and aspirations. CX-9 was developed to indulge personal desires while satisfying rational needs for a practical, all- weather family vehicle. Values CX-9 drivers desire were found to be:

Personal aspiration – A gratifying self-expression that's as nice to look at and sit in as it is to drive.
Effortless transition – Plenty of storage to reduce clutter for families and ease transition between personal, family and professional endeavors.
Easy parenting – CX-9's features, such as its third-row access, were developed so that even children could use them. One second-row seat can even be folded forward while still accommodating a child seat so that it does not have to be removed.
Couples retreat – With an intricate design, indulgent interior ambience and fine craftsmanship, CX-9 serves as an atmosphere parents can enjoy, whether they're ferrying kids to soccer practice or by themselves on a weekend vacation.

With those simple core principles in mind, designers, engineers and product planners collaborated in Mazda's Japanese and North American offices over the next several years to build upon the vision that would become the new CX-9.

Attention to Detail

From the moment one steps foot into the new CX-9, that person is greeted by an atmosphere of beauty and detail. Even the door jambs are finished with a level of precision that lends an air of sophistication.

Once seated, passengers notice a vertically stacked center console with details that wrap around from the dashboard to the rear seats, designed to envelop passengers in comfort and serenity. The fact that there is more than 53 pounds of sound deadening installed below the floor in three sections only complements the calm aesthetic.

A sweeping single piece of aluminum adorns the dashboard, emphasizing width, with a forward-angled dashboard that is

flanked with Auburn accents in the new, flagship Signature trim level. Satin and polished finishes on the aluminum plinth evoke Japanese craftsmanship and are inspired by Japan's famous hand-made knives.

Further heightening the elegant atmosphere is rosewood trim on the center console and front of the cabin, supplied by a premium guitar-maker. Supple Auburn Nappa leather covers seating surfaces in Signature trim with a modern design and is also evocative of bespoke horse saddles—a subtle nod to Mazda's Jinba Ittai—"horse and rider as one"— philosophy. Jinba Ittai also represents the notion that drivers should have utter confidence and control in their vehicles.

Athletic Stance

KODO's strength lies in proportion—a long hood, swept greenhouse, large wheels and short overhangs convey stability and a contained sense of energy ready to be unleashed. At 199.4 inches (5065mm) long, CX-9 is 1.2 inch (30mm) shorter than its predecessor, but its wheelbase has been stretched 2.2 inches (55mm), benefiting passenger leg room as well as entry to and exit from the rear.

CX-9 carries shorter overhangs on both ends—2.3 inches (59mm) shorter up front and 1 inch (25mm) shorter in the rear—with its A-pillars shifted back 3.9 inches (100mm), lengthening its hood and adding a sense of strength through proportions.

Housing large wheels— 18 and 20-inch wheels—CX-9's tapered fenders are pushed to the edge of its body, giving the vehicle a wide, trapezoidal stance.

The smooth lines start up front with a bold, five-point grille with double bars. They're flanked on either side by standard low- and high-beam LED headlights. The bold grille introduces a strong lower body and sleek upper body that elevates KODO, introducing sleek curves that provide a premium appeal in a segment awash with convention. The overall effect is one of purity, simplicity and Japanese beauty.

Machine Gray

Designed to make CX-9 look as though it were carved from a single ingot of steel, Machine Gray is the newest signature color from Mazda, complementing CX-9's surfacing.

In order to do achieve its look, perfect, blemish-free panels are a necessity, which come as a result of ultra-precise stamping and assembly. Paint is applied in a primer, a black base coat to add depth, the Machine Gray color and, finally, a clear coat—all spaced out such that the paint has time to set in a precisely climate-controlled environment. But that does little to describe the engineering complexity behind such a breathtaking color.

Machine Gray has a depth and luster usually reserved for concept vehicles, using principles and processes adopted from lessons learned when developing signature color Soul Red.

Additionally, CX-9 will be available in Soul Red, Snowflake White Pearl, Sonic Silver, Jet Black, Deep Crystal Blue and Titanium Flash (colors may not be available in all markets).

Introducing the Turbocharged SKYACTIV-G 2.5T Engine

Absolute control, absolutely. This is a hallmark of Jinba Ittai. When a driver puts his or her foot down on the accelerator, a vehicle should do what the driver expects, harmoniously working to find the right gear at the right engine rpm to deliver the performance called upon for a given situation.

Throughout the SKYACTIV engine series, Mazda has never focused on the numbers that appear in the catalog. Rather, Mazda aims to offer customers a combination of great performance in everyday driving situations and excellent fuel economy. And Mazda's engine development philosophy is to offer these two factors by combining the right displacement with the simplest configuration of technologies, as best suits each class of vehicle.

Based on this philosophy, Mazda's SKYACTIV engine family has delivered it promise of combined performance and fuel economy, and it continues to do so with the introduction of the new SKYACTIV-G 2.5T. But how did Mazda land upon the decision to create this new engine?

When Mazda's engineers set out to design a new engine specifically for CX-9, they looked at how drivers used their vehicles. Customers want effortless acceleration through bountiful torque delivery, so engineers developed the SKYACTIV-G 2.5T with enough power and torque to provide ample acceleration without having to hunt through the gears.

Customers also expect top-notch fuel economy—not just on a catalog label, but in the real world, too. Mazda had a clean sheet from which to design a new powerplant. A large- displacement, naturally aspirated engine could deliver instant performance, but it would lack fuel-efficiency. A small-displacement, naturally aspirated engine could deliver fuel- efficiency, but it would sacrifice a premium performance feel. Finally, turbocharged engines often promise both effortless acceleration and high fuel-efficiency, but oftentimes, in the real world, their efficiency is not much better than a larger-displacement engine. Turbocharged engines can also "lag" before their turbocharger spools up, creating a sluggish, disappointing driving sensation when power is called upon.

However, Mazda's latest engine, the SKYACTIV-G 2.5T, is a realization of excellent real- world and catalog fuel-economy as well as spry acceleration, featuring a host of technological advancements to achieve this goal.

One piece of technology is Mazda's Dynamic Pressure Turbo, the world's first turbocharger with the ability to vary the degree of exhaust pulsation depending on engine speed. The system routes engine exhaust to the turbocharger's turbine through smaller ports at low rpm. It works similarly to when one might place his or her thumb on a garden hose, creating a strong amount of pressure through a smaller outlet. This allows the turbocharger to spool up quickly, creating instant boost—up to 1.2 bar (17.4 psi) of pressure. When the engine is in the heart of its rev range, it opens up secondary valves, allowing for greater amounts of exhaust gas to pass through the turbocharger. The system is complemented by the 2.5-liter engine that already benefits from more torque at atmospheric pressure than a comparable 2.0-liter by virtue of its size.

Further assisting CX-9 to maximize turbocharger efficiency is a 4-3-1 exhaust. With this setup, the exhaust from the middle two cylinders (2 and 3) is joined into a single port, while the exhausts from the outer cylinders (1 and 4) each have their own ports. These three ports come together at the entrance to the turbocharger's exhaust side, where there is always one exhaust pulse arriving every 180 degrees of crankshaft rotation. Not only does this very compact manifold keeps the exhaust pulses separate for maximum energy extraction, it also harnesses each exhaust pulse to suck the residual exhaust from the adjacent ports.

That only tells so much of the story. In order to increase fuel-efficiency, SKYACTIV-G 2.5T employs the efficient combustion of Mazda's SKYACTIV-G 2.5-liter engine and marries it to a cooled exhaust gas recirculation (EGR) system, which helps prevent burning excessive amounts of fuel when the engine is running at higher temperatures. In many turbocharged cars, heat is controlled through adding more fuel to the combustion chamber; Mazda's cooled EGR reduces the need for that.

While Mazda sees no discernible benefits on regulated test cycles from this technology, it benefits the consumer through real-world gains.

The cooled EGR helps bring engine temperatures down from approximately 500 degrees C (932 F) to just over 100 degrees C (212 F), allowing SKYACTIV-G 2.5T to operate with a compression ratio of 10.5:1—one of the highest numbers of any gasoline-powered, turbocharged engine.

The net result: 310 lb-ft (420 N-m) of torque at a low 2,000 rpm and 250 horsepower at 5,000 rpm on 93-octane gasoline (227 horsepower on 87-octane gasoline). At 55 mph (88 km/h), a driver needs just 18 horsepower to maintain speed on flat roads with a front- wheel-drive model—a four-horsepower reduction versus the outgoing model, illustrating reduced friction in all parts of the driveline and enhanced aerodynamics.

Additionally, as an example of CX-9's readily available power, in the outgoing CX-9, when a driver needed 90 horsepower at highway speeds, the vehicle would have to downshift from sixth to fourth gear. However, the new CX-9 can more quickly draw upon that power with faster, better-controlled throttle response and stay in sixth gear, allowing for a smoother operation and a greater sense of confidence.

When coupled with a weight reduction of over approximately 198 lbs. (90 kg) versus the outgoing model, CX-9 boasts improvements in driver control, chassis dynamics and performance—all leading to a greater sense of confidence from behind the wheel.

Lightweight SKYACTIV Technology and NVH Refinement

All of Mazda's sixth-generation vehicles were faced with the program objective of losing weight and increasing efficiency, which

would go toward delivering a more engaging driving experience as well.

With CX-9, even including safety and rigidity goals, engineers far exceeded objectives—so much that 53 lbs. of sound-deadening mats were added back into the body in for reduced NVH, placing it among the quietest vehicles in its class. In all, the new CX-9 lost approximately 198 lbs. (90 kg) in front-wheel-drive configuration and approximately 287 lbs. (130 kg) when equipped with predictive i-ACTIV AWD.

The weight savings allowed Mazda engineers to increase window thickness to 4.8mm and rethink active noise-cancelling technologies, in addition to using simpler, more rigid parts, to reduce noise. At 62 mph (100 km/h), interior noise levels have been reduced by 12 percent from the previous model and road noise levels have been reduced by 2.0 dB.

Safety at the Forefront

Mazda has been a leader in building safer vehicles through several methods:

Provide an optimum driving environment with well-positioned controls, easy-to-read instruments, minimal driver distractions and good visibility.
i-ACTIVSENSE, which provides active safety features like Mazda Radar Cruise
Control (MRCC) and Blind Spot Monitoring (BSM).
Passive safety, which is designed to make the structure and onboard features such that they protect occupants in the case of an accident.

Mazda's class-leading chassis dynamics and outstanding HMI technologies adhere to Jinba Ittai, advancing the notion of purposeful technology that reduces clutter and improves the driving experience. A lighter, yet more rigid, chassis and straight load-path frame rails integrated into the unibody secure crash protection in the event of a collision and lighter weight improves braking performance with 12.6-inch (320mm) ventilated front disc brakes and 12.8-inch solid rear discs (325mm). Those brakes are unchanged in size from the previous model, but they now have approximately 198 fewer lbs. (90 kg) to halt.

CX-9's i-ACTIVSENSE suite1 features new and notable safety features, including:

Advanced Blind Spot Monitoring (ABSM): Employing a 24 GHz radar on each side of CX-9, ABSM can detect vehicles closing in from as much as 164 ft. (50m) away.
Mazda Radar Cruise Control (MRCC): Operating at speeds between 30 km/h to 145 km/h (19 to 90 mph), MRCC uses millimeter wavelength radar to judge the relative speed and distance to the vehicle ahead. In accordance with the target speed set by the driver, the system automatically controls the engine and brakes to maintain the driver-selected vehicle speed and safer following distance, which is also adjustable by the driver. Because the driver does not need to operate the accelerator or brakes while using MRCC, the system relieves some of the burden on long drives. The radar sensor is capable of precise detection from a long distance, so its use allows the system to operate effectively in the rain, in backlit situations, and at night. It is also possible to turn off all of the system's automatic functions and revert to conventional cruise control should road conditions make this more desirable.
Lane-Keep Assist System (LAS) and Lane Departure Warning (LDW): Rather than keeping CX-9 centered in a lane between two lines as some systems do, which can cause an unnatural-feeling tug on the steering wheel, LAS, which is available in a Mazda for the first time in the U.S., helps ease CX-9 into turns. Meanwhile, LDW vibrates the steering wheel to warn drivers if they begin to stray from the lane. LAS will employ a progressive approach to assisting users to drive within lanes, but the system will deactivate after warning the driver if it senses he or she has taken his or her hand off the wheel.
High Beam Control (HBC): HBC allows users to keep high beams on at all times, dipping them when necessary when a camera built into CX-9 detects headlights from oncoming vehicles or tail lights. The system automatically switches to low beams below 19 mph (30 km/h), when they are unnecessary.
Smart City Brake Support (SCBS): Using an near-infrared sensor mounted to the windshield, SCBS operates between 2 and 19 mph (4 and 30 km/h) to apply the brakes in order to lessen the severity of an impending and inescapable collision at up to 20 ft. (6m).
Distance Recognition Support System (DRSS) and Forward Obstruction Warning (FOW): Uses a millimeter wavelength radar to display the distance of CX-9 to the vehicle in front of it in a five-step display, encouraging the CX-9 driver to lessen his or her speed if necessary. If distance between vehicles decreases and evasive action is necessary, audible and visual Forward Obstruction Warning signals will indicate that evasive action is needed.
Smart Brake Support (SBS): Operates at speeds above 9 mph (15 km/h) to automatically brake in the case of an impending collision.

i-ACTIV AWD Predicts Road Conditions for Maximum Stability

In 2013 when Mazda introduced its first full-SKYACTIV vehicle, CX-5, it also ushered in its i-ACTIV AWD system that could instantly recognize road conditions and adjust response accordingly. Mazda's all-wheel-drive system in the previous CX-9 took approximately 10 factors into account, including on-road speed, engine rpm and wheel slip, among others. The information was then fed through the onboard computers that would modulate torque transfer between front and rear axles.

i-ACTIV AWD upped the ante, implementing a host of other sensors that were already integrated into vehicles for other functions and channeling the information they presented such as ambient temperature, steering wheel angle, longitudinal grip, brake fluid pressure and even windshield wiper movement. In all, i-ACTIV AWD brings 27 different sensors together to paint a picture of road conditions and direct torque to the rear wheel as necessary, predicting what the driver may face on a slick road in the winter or in heavy rain.

i-ACTIV AWD measures road conditions 200 times every second and can adjust power distribution to account for wheel slip even in dry conditions. It can even route power to limit understeer during spirited driving, sending as much as 50 percent of CX-9's power to the rear wheels through Mazda's proven six-speed SKYACTIV-DRIVE automatic transmission.

Family Vehicle, Couples Retreat

At its core, CX-9 is a family vehicle, with three rows, space for seven passengers and storage for every which item a family may need.

To maximize comfort for front-row passengers and space for those in the second row, engineers went to great lengths to redesign the front seats with thinner seatbacks, yet make them more comfortable.

For the first time in a Mazda, low-rebound high-damping urethane is used in the seat backs of the front seats as well as the seat cushions. This material transmits desirable feedback from the road surface to the driver, while filtering unpleasant vibrations from rough road surfaces, helping to realize the CX-9' high-class ride comfort. The same material is used in the cushions of the second row seats as well.

To get to the third row, Mazda's engineers sought to make access so easy that even a child could do it with a single, simple lever. There are two LATCH/ISOFIX mounting points in the second row, with the right-side of the 60/40 split-fold seat having been designed to make it possible to accommodate a child seat staying in place while still allowing passengers third-row access.

At the rearmost of CX-9, the electronic module that raises and lowers the liftgate has been made more compact and 2.4 lbs. (1.1 kg) lighter and does not intrude upon cargo space. Two handy storage bins reside underneath the cargo floor for extra storage.

CX-9 has "family" covered in spades, but it also offers an ambience of elegance and sophistication for those times when morning school runs or sports practices aren't a priority.

Front passengers are greeted with elegant white LED accent lighting throughout their cabin space, with a backlight accenting the raised console and a spotlight guiding the driver to the center instruments.

Coupled with its sporting driving feel, torquey, responsive engine and refined ride, CX-9 is just as good at whisking passengers away to a weekend cabin retreat as it is at kids- shuttling duties.

The Heads-Up Cockpit

Customers have high expectations for the technology desired in their vehicles, allowing them to connect to the outside world while in the comfort of their car. Conversely, Mazda's core philosophies center around a focused driving experience, built on what it calls the Heads-up Cockpit design and complementing Jinba Ittai.

The resultant point where needs and wants converge helped create MAZDA (MZD) CONNECT, an infotainment suite designed around a distraction-free experience that still allows users to stream music, make hands-free calls and use other internet-based applications. MAZDA CONNECT uses both Bluetooth and cable-based connections via two USB ports accessible to front passengers for functions like Pandora or Aha by Harman music streaming.

New CX-9 comes with a seven-inch or eight-inch MAZDA CONNECT touchscreen infotainment system standing front and center for connectivity needs with commander control knob. Using both touchscreen functions when parked and a center-mounted commander control knob when on the move, MAZDA CONNECT intuitively and safety control radio, phone, navigation, diagnostic and phone functions. MAZDA CONNECT also enables voice controls for many functions as well as five shortcut buttons around the commander control for selecting favorite radio channels or enabling specific functions.

The driver also has an available 4.6-inch, full-color TFT screen in the gauges for many of these information readouts in addition to Active Driving Display, a full-color head-up display projected onto the lower windshield for readouts from the navigation, cruise control and other functions.

In back, passengers have two 2.1-amp USB ports available for charging smartphones or tablets, each mounted in the outboard passenger armrests.

Together, the technologies allow an unfettered driving experience while still allowing for the needs and wants of today's drivers and passengers.

Last but not least is the new Bose premium audio system, which is designed to deliver outstanding clarity, image and range. The 12-speaker system—two additional speakers from the previous CX-9's Bose premium audio system—was benchmarked against stereos from ultra-premium crossover utility vehicles using several different audio formats, including radio and both full and compressed digital formats.

The Bose system in CX-9 was designed to be able to take compressed audio formats— often the go-to for many people—and tailor the frequency ranges of the audio files to better-simulate how the music would sound at a concert, with precise imaging and robust quality. Bose sound engineers worked with Mazda's development team to acoustically tune CX-9's interior, even going so far to develop silk tweeter covers specifically for CX-9 to make sure sound travels the way it was meant to do so.

But not forgetting Mazda's commitment to lightweight engineering, the entire system was designed to be light, foregoing traditional, heavy magnets in some speakers for neodymium, accommodating for slim packaging while delivering passengers the best experience in all three rows with perfect clarity.

A Future of Possibilities

CX-9 is scheduled to go on sale in Spring of 2016 in the U.S. CX-9 represents a capstone for the new generation of Mazda cars and crossovers and a high-end model indicating what is to come with innovative powertrains, engaging driving dynamics, premium quality and the evolution of the award-winning KODO—Soul of Motion design ethos. With those qualities, Mazda aims to build the most emotionally stirring, captivating vehicles in the industry, elevating its brand to new heights around the world.

1 Note: i-ACTIVSENSE technologies vary by region and some may not be available markets where CX-9 is sold. Final packaging and options availability subject to change.

Additional assets available online:
PHOTOS (1)

https://news.mazdausa.com/2015-11-18-All-New-Mazda-CX-9-Three-Row-Crossover-Debuts-at-2015-Los-Angeles-Auto-Show