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## **All-new 2019 Ram 1500 Engineered to Deliver Durability, Refinement and Efficiency**

- Strongest Ram 1500 ever
  - Most capability, highest efficiency and greatest durability
  - Strongest cab with 54 percent high-strength steel
  - Strongest frame with 98 percent high-strength steel
- Maximum payload increased to 2,300 pounds, and maximum trailer tow to 12,700 pounds
- New frame features extensive use of high strength steel, noise-, vibration- and harshness-reduction measures, weight savings and greater rigidity for improved handling and durability
- New Ram 1500 is the segment's most aerodynamic pickup at .357 coefficient of drag – a nine percent score improvement – and features exclusive active aerodynamics: grille shutters, air dam and air suspension
- All-new Frequency Response Damping (FRD) shocks deliver the best combination of ride, handling and comfort in a pickup
- Total vehicle weight reductions totaling nearly 225 pounds net when compared to previous model – about 120 pounds from chassis and 100 pounds from core body structure
- Next generation, class-exclusive air suspension enhances fuel economy, improves ride, and gives greater off-road capability, load-leveling and entry/exit convenience
- Interior noise reduced to 67.1 db
- Largest front brakes in segment at 14.9 inches
- New tire-fill alert system and new electric parking brake add to long list of convenience features
- New 4x4 Off-road Package includes suspension with one-inch lift, electronic locking rear axle, tuned shocks and Hill-descent Control
- New Ram Rebel now available in Quad Cab and standard coil suspension with factory one-inch lift (air suspension optional), rear locking axle, Bilstein shocks, 33-inch Goodyear Wrangler DuraTrac tires and Hill-descent Control

January 15, 2018, Auburn Hills, Mich. - The all-new 2019 Ram 1500 capitalizes on segment-exclusive features and advanced engineering to deliver the most durable, efficient and comfortable Ram 1500 the company has ever built.

"With a focus on durability, we've adapted new technology to greatly improve durability, capability and fuel efficiency on the new Ram 1500," said Rob Wichman, Head of Ram Truck Engineering. "The Ram 1500 is lighter, stronger and provides what customers expect in a modern truck – more technology, innovation and features."

### **Chassis**

The new Ram 1500 uses the longest, lightest and most efficient frame in the half-ton truck segment. The chassis has reduced weight by 120 pounds – 100 pounds from the frame alone delivering a maximum payload of 2,300 pounds and maximum trailer tow of 12,700 pounds. The redesigned frame also improves torsional stiffness, which increases stability and handling precision while decreasing noise, vibration and harshness (NVH). Among its other features, the new frame design incorporates new powertrain, new air suspension and new C-pillar hydraulic body-mounting

technology to improve ride quality and comfort.

The strongest Ram 1500 frame ever produced includes the same impact countermeasures across all configurations, and is made from 98 percent high-strength steel. Exclusive front splayed frame rail technology (patent pending) creates a highly efficient energy absorbing structure for all impact modes, including front-offset with frame integration forward of front tire. Also, frame-mounted high-steel tire blockers are placed behind the front tires to force wheels outward in the event of impact. Additionally, side rails are taller, and fully boxed. To further improve NVH, new electronically controlled side-frame-mounted active tuned-mass modules (ATMM) work in harmony with an interior active noise cancellation (ANC) system on 5.7-liter HEMI V-8 equipped models to reduce ambient sounds down to a low 67.1 db – the quietest Ram 1500 ever. Rear cross members are double sheer welded to the inside and outside of the frame for improved durability and roll stiffness.

Helping to create the most spacious cab in the segment, three new, longer frame lengths are offered: a 144.5-inch wheelbase on Crew Cab short beds and a 153.5-inch wheelbase on Crew Cab long beds – both four inches longer than their predecessors. The Quad Cab long bed has a wheelbase of 140.5 inches. Engineers did not let the greater lengths stop Ram's newest pickup from having a tight turning radius at just 46.2 feet curb to curb – an improvement when compared to the previous model.

New front independent suspension combines lightweight composite upper control arms, aluminum lower control arms and retuned geometry for improved responsiveness and handling. The front and rear stabilizer bars are hollow to save weight. The front stabilizer bar is relocated behind the front tires, further improving roll stiffness by 20 percent. A new front coil-over shock design is standard equipment on all Ram 1500s regardless of configuration.

Ram introduced its exclusive multi-link, coil-spring rear suspension in 2009 and the competition has been trying to catch up ever since. The exclusive five-link coil design provides better articulation over obstacles than a leaf spring system, and the robust coil springs are more than up to the task of handling a payload of 2,300 pounds and towing capability of 12,700 pounds. The 2019 Ram 1500 features newly designed progressive rate coil springs to help maintain load-leveling attributes even under the heavy payload or towing. More robust link bushings increase durability while continuing to deliver the most comfortable ride and handling in a full-size truck.

Benefits of a rear coil suspension are a superior unloaded ride and improved handling, but the positives don't stop there.

The five-link coil design incorporates support at all major points of force. Leaf spring suspensions struggle to combat axle wind up by using staggered shock absorbers (one mounted on the front of the axle tube and one mounted on the rear of the axle tube). The superior design of the five-link coil system functionally resists unwanted axle rotation. Leaf spring configurations also lack lateral support, forcing the leaf ends and shackles to hold against lateral loads – a task they're not particularly good at and one reason competitive leaf-sprung rear suspensions shudder on rough surfaces.

Because of the unique five-link axle control and natural rotation, U-joints in the driveshaft run smoothly and with less vibration through the suspension's range of motion, an advantage not shared with leaf springs. Another benefit of coil springs is less unsprung mass and elimination of stick-slip friction often found between the leaf springs. Additionally, links are engineered in-line with frame rails, so overall packaging is better, not to mention an overall weight reduction of about 40 pounds when compared to a leaf-spring configuration.

### **Frequency Response Damping (FRD) shocks**

Frequency Response Damping (FRD) has benefitted on- and off-road race cars for many years. More recently the technology has found its way into the 2019 Ram 1500 with FRD shocks on all four corners. The valves of an FRD shock automatically adjust for the type of vertical wheel input, allowing the Ram 1500 to have sports-car-like suspension for handling and a supple suspension on rough terrain. The FRD shocks filter out both actuation frequencies by using a creative internal design. When the Ram 1500 experiences a slower input, common during cornering and heavy braking, the bypass valve is closed for more aggressive damping, which provides additional stability and poise. When driving normally or exposed to faster shock inputs – which is common on rough roads or at higher speeds – the valve will open to soften the damping, giving the driver more comfort, confidence and control.

## **Body**

The all-new Ram 1500 uses several materials in the body panels and core structure to drop the body weight by more than 100 pounds while improving durability. 210 (MPa) bake hard steel is used on fenders, doors and roof and 340 (MPa) High-strength low-alloy (HSLA) is in the truck bed. The 6,000-series aluminum drops 10 pounds from the hood and 15 pounds from the tailgate. The supporting structure surrounding the engine bay and forward wall is 760 (MPa) multi-phase steel. The A-, B- and C- pillars use a 1300 MPa press hardened steel. Within the door shell is also a 1300 MPa press-hardened steel door beam.

The new aluminum tailgate not only features damping during opening, it also integrates a lift-assist measure. Unlike most competitors, Ram uses a nitrogen- and oil-charged strut, which gives consistent assist in even the coldest or warmest climates and consistent assist through the entire tailgate swing. The latch-and-lock mechanism is now electronic, reducing the amount of moving parts and allowing owners to drop the tailgate with the interior switch, remotely with the key fob or unlock/open with passive entry. Customers with arms full will appreciate the ability to easily access the bed on approach. The newly designed tailgate also features a class-exclusive "tailgate-ajar" notification in the cluster.

## **Lightweight materials**

Reducing the weight of components on the new Ram 1500 improves fuel economy and allows for more content while raising payload and towing capability. By using effective high-strength steels, composites and aluminum, the 2019 Ram 1500 has dropped nearly 120 pounds from the chassis (100 pounds from frame alone) and nearly 225 pounds overall when compared to the previous generation. Additional weight reductions balance out added content to provide new comfort and fuel-saving content. One example is the new eTorque mild hybrid system.

The most robust Ram 1500 frame ever produced is made from 98 percent high-strength steel and benefits from a weight reduction of approximately 100 pounds. The advanced metal also is used in 54 percent of the body, further reducing overall weight by 100 pounds and forms the basis for the strongest Ram 1500 cab ever.

The all-new Ram 1500 also takes advantage of lightweight, aluminum for selective components, not just where possible but where practical. Although the Ram 1500 hood and select chassis components pioneered aluminum in 2009, the following chassis elements on the Ram 1500 made a notable reduction in weight by moving to aluminum in the all-new model:

- Tailgate
- Engine mounts
- Front axle center section
- Front suspension crossmember
- Transmission crossmember
- Steering system gear

Light weighting also involves substituting composites for metal – which offer high-tensile strength at very low weight. The upper front suspension control arms (integrated with a steel structure), and the air dam structure are made from, or combined with, composite materials.

The weight reductions allow for more convenience, comfort and entertainment features but also innovative fuel-saving technology, such as thermal management, eTorque and active aerodynamics.

## **Aerodynamics**

Further demonstrating efficiency through engineering, extensive wind-tunnel testing honed the 2019 Ram 1500 exterior shape, resulting in continued, class-leading aerodynamics. Also, the cooperative application of active aerodynamics and modern styling led to a nine percent aerodynamic improvement on the new truck. The 2019 Ram 1500 Quad Cab 4x2 coefficient of drag is .357.

As the 2019 Ram 1500 approaches 35 miles per hour (mph), a standard active front air dam automatically extends downward 2.5 inches (non-air suspension and Rebel trucks). Because pickups often encounter obstacles in their path on dirt roads or job sites, the active air dam has a clutch-release system to help prevent damage in case of strike. The optional air suspension system lowers the truck 0.6 inches improving overall aerodynamics and efficiency. Ram

engineers didn't stop there. The new Ram 1500 also employs an active grille shutter system, which automatically closes the airflow through the huge grille when cooling is least needed. Altogether, these active aerodynamic elements give the all-new Ram 1500 an aero signature that not only dominates the full-size pickup segment but beats some small vehicles.

The active grille shutter system improves fuel economy during warm-up time/defrost time. When the active grille shutters are closed, airflow is redirected over and around the front of the truck, enhancing aerodynamic performance, rather than creating turbulence in the engine compartment and under the truck. Engine coolant temperature, air conditioning requirements and vehicle speed determine shutter position. The shutters remain closed when less engine cooling is required and aerodynamic drag is most significant; the system will open the shutters when the truck's cooling demands require additional airflow, for example traveling up a hill or pulling a trailer in high-temperature environments.

The body of the new Ram 1500 is the product of design and engineering cooperation at its best. The new Ram 1500s elevated hood better directs air away from the wiper area – improving overall aerodynamics and reducing wind noise. A new venturi roof design better directs air back to the rear spoiler – making it the most effective pickup roof treatment to date.

Significant time was dedicated to designing the truck bed itself to increase usability and aerodynamics. Bed rails are raised by 1.5 inches to reduce drag as does a new spoiler on the new aluminum tailgate. The bed-to-cab execution is sub-flush to reduce disturbance alongside the body. A wheel-to-wheel tubular side-step design offers aerodynamic improvements by allowing air to pass around the truck more smoothly. The improvement adds 0.5 percent to fuel efficiency and allows customers easy access to the forward portion of the truck bed. A segment-exclusive lockable tri-fold tonneau cover serves a dual purpose by improving fuel economy by 0.8 percent and adding security and weather protection for bed storage. The unique design is flexible, giving owners the ability to utilize one, two or all three sections of the cover by folding the system on top of itself.

#### **Air suspension**

The segment's best ride and handling gets even better with the addition of FRD shocks with air suspension. The 2019 Ram 1500 is the only full pickup available with a four-corner air suspension system for optimum ride and aerodynamic performance. Another benefit of the new air suspension is the load-leveling capability, which automatically detects load on the suspension from a trailer or payload. The gas pressure increases until the vehicle reaches normal ride height, leveling the truck and improving the loaded ride.

The air suspension system features five height settings (four on Rebel) that operate automatically or may be controlled manually via console or key fob controls:

- Normal Ride Height (NRH): 8.7 inches of clearance (measured from the base of the door sill) is the default, load-leveled ride height
- Aero Mode: Lowers the vehicle 0.6 inches from NRH. Aero Mode improves fuel efficiency by up to one percent and is activated by vehicle speed, adjusting for optimal performance and fuel economy
- Off-road 1: Lifts the vehicle 1.2 inches from NRH, reaching 9.1 inches of ground clearance, helping to clear obstacles
- Off-road 2: Delivers more off-road capability, increasing ground clearance by 2 inches over NRH to 10.1 inches
- Park Mode: Lowers the vehicle 2 inches from NRH for easy entry/exit and cargo loading

The four-corner system delivers four inches of lift span and several additional segment leading features:

- Lowest step-in height of 20.9 inches
- Most ground clearance of 10.1 inches
- Best departure angle of 27.3 degrees
- Greatest break over angle of 23 degrees

The air suspension system also allows for different spring rates depending on the ride height. In Off-road 2, the rate is firmer when compared to NRH, improving the ability of the suspension to soak up obstacles. In Aero mode, the rate is softened to improve the ride on highways. The lower center of gravity adjustment also creates better handling

characteristics for rapid maneuvers or turns while at speed.

Additionally, a separate button on the key fob gives the operator the ability to manually lower the truck, allowing for ease of passenger entry and bed loading.

### **Off-road**

Ram continues to build on the brand's enthusiast lineup and reinforces its claim of America's Off-road Truck Leader. Engineered to conquer the great outdoors, Ram Truck has held one title longer than any production pickup – most off-road-capable with the Ram Power Wagon. Joining the Power Wagon, Ram Rebel and the Ram 2500 4x4 Off-road Package, the brand now adds a robust 4x4 Off-road Package for the Ram 1500 on nearly every trim. The offering includes a one-inch suspension lift with or without the available four-corner air suspension. An electronic-locking rear differential and 32-inch tires on 18- or available 20-inch wheels provide additional grip. Hill-descent Control, an off-road biased rear suspension geometry (Rebel and 4x4 Off-road Package) and unique off-road-calibrated shocks bolster trail capability. The package also includes skid plate protection (transfer case, steering, engine and gas tank) and tow hooks.

Also new for 2019, the Ram 1500 Rebel is even more capable, now available in Quad Cab configurations and featuring new 18-inch wheels with Goodyear Wrangler DuraTrac 33-inch tires driven by an electronic-locking rear differential. The Rebel predecessor came standard with Ram's Active-level four-corner air suspension and a one-inch suspension lift. While air suspension is still available, the new Rebel comes standard with coil spring suspension and a one-inch factory lift. Newly designed Bilstein shocks feature remote reservoirs to keep the shocks cool and work with unique rear suspension geometry (Rebel and 4x4 Off-road Package) to keep the tires in traction. Rebel also includes Hill-descent Control for more off-road prowess. Hefty tow hooks feature wide bumper openings to ease use and the underbody protection features skid plates on the transfer case, steering system, oil pan and gas tank.

### **Brake system**

With 18 percent more pad area, the 2019 Ram 1500 features the largest front brake rotors in segment at 14.9 inches.

Four-wheel disc brakes are standard on all 2019 Ram Truck models. Front rotors measure 14.9 inches (378mm) in diameter and are clamped with dual-piston calipers, while rear rotors are 14.8 inches (375.91mm) and utilize single-piston calipers.

A new electric parking brake eliminates 20 pounds from the previous system and works jointly with the truck to identify automatic engagement events. Selectable in the cluster, the brake can be set to automatically apply when the gear shifter is moved to Park. Also, if the driver door is opened and the driver seat belt is unlatched, the park brake will automatically apply.

### **Electric power steering**

The 2019 Ram 1500 continues to feature electric power steering (EPS). The next generation system reduces weight by six pounds and includes tuning for lighter and quicker steering. By using an electric motor to power the truck's rack-and-pinion steering system, the engine is relieved from the task of constantly turning a hydraulic pump, improving fuel efficiency up to 1.8 percent and adding 5 horsepower. Also, EPS reduces complexity by removing the previous hydraulic pump, high-pressure hydraulic hoses and cooling apparatus. This greatly streamlines manufacturing and maintenance. With EPS, each Ram 1500 model can be specifically calibrated to optimize steering effort and precision regardless of body or powertrain configuration. Additionally, EPS senses constant input from the driver, for example a crown in the road, and compensates for improved comfort.

### **Pulse-width modulation**

Pulse-width modulation (PWM) is a fuel-saving technology for the Ram 1500, which reduces parasitic electrical load. The technology not only eliminates unnecessary load on the alternator but also improves the durability of benefitting systems. Fuel delivery and the forward cooling fan are two systems that take advantage of PWM, adding a 0.4 percent improvement in fuel efficiency.

### **Fuel pump**

The primary fuel pump is responsible for ensuring a constant pressure of fuel at the engine's injectors. Although the truck is not always at full throttle, the pump must continuously run at operating capacity to compensate for when the

engine requires full throttle fuel delivery. The PWM system includes a sensor at the fuel rails dictating fuel pressure requirements, allowing the primary fuel pump to operate on-demand, much like a light dimmer switch. This efficient operation not only results in reduced parasitic loss by relieving the alternator and reducing unnecessary load on the engine, but also greatly improves the durability of the fuel pump system by significantly reducing duty cycles.

#### **Cooling fan**

The radiator's electric cooling fan also features PWM, allowing the high-current fan to operate at variable speeds. As in fuel delivery, the fan does not need to operate at full capacity during all drive cycles. Although most automotive fan systems function at a variety of speeds, few will closely monitor the engine temperature and make slight changes in speed to compensate for subtle temperature changes. The combination of a PWM fan, active grille shutters, and powertrain/driveline thermal management system provide an advanced temperature-control solution for the 2019 Ram 1500.

#### **Low-rolling-resistance tires**

The 2019 Ram 1500 features standard low-rolling-resistance tires to minimize wasted energy and decrease required rolling effort. Measured in coast down tests, today's Ram 1500 tire is 10 percent more efficient when compared to tires of just 15 years ago. Tread patterns, advanced materials and millions of miles of testing result in greater fuel efficiency.

Convenience is improved with a new tire-fill-alert system. When adding air pressure to tires, the tire-fill-alert system chirps the horn once you have reached the recommended pressure.

#### **Unsurpassed Powertrain Warranty – Five years/60,000 miles**

The 2019 Ram 1500 is backed with a five-year/60,000-mile Powertrain Limited Warranty. The Powertrain Limited Warranty covers the cost of all parts and labor needed to repair a covered powertrain component – engine, transmission and drive system. Coverage includes free towing to the nearest Ram Truck dealer, if necessary. The warranty also is transferable allowing customers who sell their truck during the warranty period to pass the coverage onto the new owner.

The standard three-year/36,000-mile Basic Limited Warranty provides bumper-to-bumper coverage for the Ram 1500, from the body to the electrical system.

#### **Manufacturing**

The 2019 Ram 1500 is built at the Sterling Heights Assembly Plant (SHAP) in Sterling Heights, Michigan.

#### **Ram Truck Brand**

In 2009, the Ram Truck brand launched as a stand-alone division, focused on meeting the demands of truck buyers and delivering benchmark-quality vehicles. With a full lineup of trucks - the Ram 1500, 2500/3500 Heavy Duty, 3500/4500/5500 Chassis Cab and ProMaster - the Ram brand builds trucks that get the hard work done and families where they need to go.

Ram continues to outperform the competition and sets the benchmark for:

- Best-in-class standard horsepower
- Segment-first 1,000 lb.-ft of torque with Cummins Turbo Diesel
- Most luxurious: Ram 1500 Tungsten with real metal and leather elements and a new 14.5-inch Uconnect touchscreen
- Best ride and handling with a double wishbone front suspension and five-link solid rear axle with available, segment-exclusive, active-level, four-corner air suspension
- Best-in-class available rear leg room
- The most cargo space available in any traditional full size cargo van
- Most capable full-size off-road pickup – Ram Power Wagon
- Most awarded light-duty truck in America
- Highest owner loyalty of any half-ton pickup

The latest [J.D. Power APEAL study](#), which rates the emotional bond between customers and their vehicles, named the 2023 Ram 1500 as the best full-size light-duty pickup.

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