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Rebel TRX is an Engineered, Functional Concept

- Wheel travel greater than 13 inches at all four corners, an increase of more than 40 percent
- Aggressive 37-inch tires effortlessly roll over the roughest surfaces
- Front and rear bypass performance shocks combine fast-reaction time, unbeatable damping and improved heat dissipation for traversing harsh terrain at speeds greater than 100 miles per hour
- Ram Rebel TRX concept benefits from Ram 1500 five-link coil rear suspension with unchanged hard points

September 29, 2016, Auburn Hills, Mich. - The Ram Rebel TRX has an aggressive exterior design, which is only trumped by what lies under its skin. The concept was built around powertrain, suspension and frame prerequisites. Also pertinent, adapting as many systems from the standard Ram 1500 as possible to ensure durability and proper function.

“The Rebel TRX can move through miles of rough terrain at incredible speeds, effortlessly absorbing impacts in a way that would very much surprise most people,” said Rob Wichman, Head of Ram Engineering – FCA North America. “Engineering a truck with such a high tolerance for punishment keeps the focus on chassis development and durability.”

Frame

The high-strength steel frame structure of the Ram Rebel TRX is virtually unchanged when compared to a standard Ram 1500. The frame uses low-torsion (stiffness) attributes that increase durability, stability and handling precision.

The Rebel TRX frame accepts the new supercharged powertrain and incorporates new suspension design. As in all Ram 1500s, portions of the frame are hydroformed for dimensional accuracy (hydroforming reduces the amount of welding, which leads to distortion) and side rails are fully boxed.

A 40 percent increase in suspension travel and larger tires also contribute to incredible ground clearance. This combination allows the TRX concept to overcome surface obstacles at high speed.

Front suspension

The front frame section incorporates advanced, high-strength steel that maintains overall strength and durability for adapting an all-new independent front suspension system for the Rebel TRX. Ram engineering collaborated with Dirt King Fabrication in San Diego, California, to custom build upper and lower A-arms with special attention to caster and camber angles during suspension cycling. The upper arms are linked to the frame with high-movement heim joints, lower arms use bushings. Both upper and lower arms use a uniball at the knuckle. Overall, front- and rear-wheel travel is increased to more than 13 inches from the standard 9 inches. Front loads are managed by state-of-the-art, adjustable, performance coil-over shocks with internal bypass. The coils handle spring load, but the magic lies in the bypass shock design. This fully adjustable shock allows hydraulic fluid to flow via adjustable internal passages for fine tuning. As the suspension moves closer to the maximum points, top and bottom, the piston inside the shock bypasses select passages, making it harder for fluid to move and slowing down the suspension as it nears “full jounce” and “top out.” The result is a smooth ride over smaller bumps and when the bumps become mounds, the reaction speed and heat dissipation is unbeatable, softening the impact on occupants and maintaining the tire-to-ground contact.

Rear suspension

The Ram 1500 uses an exclusive, best-in-class link coil rear suspension system that provides incredible ride characteristics, durability and lighter weight. The system also shares basic architecture with the fastest off-road trucks

in desert racing. Ram Rebel TRX's rear suspension took packaging barriers and engineering into consideration with a unique application. Dirt King Fabrication collaborated on an innovative solution to produce greater wheel travel without reducing the cargo area of the bed. The frame's hard points for the five-link suspension system are unchanged and allow the rear axle travel to span up to 13 inches, while standard rear-wheel travel on the Ram 1500 is 9.25 inches. Upper and lower links are 1.75-inch x .188-inch-wall drawn-over-mandrel tubing. The Panhard bar is constructed from 4130 chrome alloy for increased strength. The four upper and lower links use a heim joint at the frame mount to improve movement and a bushing at the axle. The link placement carefully rotates the axle during full cycle without overextending the driveshaft U-joints or slip yoke. The Panhard rod aligns the rear axle and is linked with heim joints on both ends. Increased wheel travel demands longer shocks. New 2.5-inch rear bypass shocks use factory upper and lower shock mounts. The shock's reservoir, bypass tube layout and extended/collapsed length are specifically designed for the Ram 1500. The standard rear coils are swapped for performance springs located in the factory-set positions.

Sway bars

Sway bars located in the front and rear use factory mounting points with extensions to accommodate longer wheel travel. Although the Ram Rebel TRX-spec concept sits higher than a standard Ram 1500, applying too much resistance at the sway bar would hurt the truck's ability to articulate left-to-right and fight the suspension from keeping tires to the ground.

Steering

Steering on the Ram Rebel TRX concept is unchanged from the Ram 1500, featuring electric power steering (EPS). By using an electric motor to power the truck's rack and pinion steering system, the engine is relieved from the task of a constantly turning hydraulic pump. Also, EPS reduces complexity by removing a pump, high-pressure hydraulic hoses and cooling apparatus. With EPS, each Rebel TRX concept 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.

Tires and wheels

High-speed truck off-road race teams commonly use a 37-inch tire for its height and durability. The Rebel TRX is no exception and ruthless to the medium that lies between the powertrain and the ground. Tires with 37 inches of height, 13.5 inches of width, aggressive treads and 10-ply design are assigned the task for the Rebel TRX. Tires are normally held to a wheel by air pressure. The Rebel TRX concept features custom beadlock wheels from Mopar. Beadlock wheels provide additional tire-holding strength by pinching the outside of the tire to the rim. This increase in holding strength prevents higher horsepower vehicles from spinning the wheel inside the tire "breaking the bead." It also allows much greater lateral pressures like those incurred in a 60 miles per hour (mph) sideways drift through rocks. Additionally, beadlocks increase run-flat operation and allow for extremely low pressure use without losing a tire off the rim. The Rebel TRX carries two complete spare tire and wheel packages on a dedicated rack in the bed of the truck. The backup rubber allows for not one, but two tire replacements. Tools and jack are located in custom, lockable storage between the wheels in the bed. The added weight located rearward also helps handling characteristics of the Rebel TRX.

Brakes

Getting up to 100 mph is not a challenge for Ram Rebel TRX, but stopping the machine requires a four-wheel disc brake system. The factory hydraulic-boost compensation unit enhances brake pedal feel and performance during emergency stop events. Up front are Baer Brakes six-piston monoblock calipers mounted to 15-inch, two-piece slot, drilled, zinc plated rotors. The rear uses six-piston calipers with 14-inch rotors to provide incredible stopping power.

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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