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Chrysler Group Develops Dodge Ram for U.S. Army With State-of-the-Art Off-Road Suspension

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A military version of the Chrysler Group's popular Dodge Ram pickup features a state-of-the-art hydro-pneumatic suspension system able to negotiate severe off-road terrain.

This unique suspension replaces the front coil springs and shock absorbers with hydro-pneumatic cylinders; the rear leaf springs and shock absorbers are replaced with a mult-link suspension and hydro-pneumatic cylinders.

The vehicle was developed by the Chrysler Group in conjunction with the U.S. Army Tank Automotive & Armaments Command (TACOM) - National Automotive Center (NAC). The suspension is currently installed on a conventionally-powered Ram, but will be included in a hybrid diesel-electric version of the vehicle being developed for the Army's Commercially Based Tactical Truck (COMBATT) program.

Among the features of the hydro-pneumatic suspension are:

- The unique hydro-pneumatic system provides the desired cornering stiffness, thus avoiding the undesirable axle articulation limitations of a conventional torsional stabilizer bar
- Load leveling. The suspension adjusts the vehicle body to a level attitude, regardless of load distribution. This keeps headlight beams at the proper height and maintains the desired suspension jounce travel for absorbing rough road inputs
- Maximum wheel/axle articulation travel. This permits wheels to travel the full extent of their designed travel range regardless of the circumstances, for example, left front wheel fully up, right front wheel fully down, left rear wheel fully down, right rear wheel fully up
- Variable ground clearance. Suspension hydraulics enable the driver to change the vehicle's body height relative to the ground. For example, the vehicle can be lowered to facilitate loading cargo or personnel or raised to maneuver over obstacles or deep snow, water or mud
- Near equal wheel loading. The hydraulic cylinders are interconnected, so loads at the four tires are automatically balanced, improving traction

The suspension is controlled by computer, so proper operation is not dependent on driver familiarity with the system. Vehicle controls permit driver/operator to specify the type of terrain being traversed.

The diesel-electric hybrid COMBATT truck, also equipped with the hydro-pneumatic suspension, will be delivered to TACOM early next year. The vehicle is based on DaimlerChrysler's Dodge Ram HEV that will be sold commercially beginning in 2004.

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