

# 2007 Explorer Sport Trac Special Features

## COMPREHENSIVE NVH IMPROVEMENTS DELIVER CLASS LEADING INTERIOR QUIETNESS

- Sport Trac benefits from comprehensive NVH improvements and road isolation
- Drivetrain enhancements include improved bushings to accommodate Sport Trac's unique, two-piece driveshaft
- New, larger side mirrors actively decrease wind turbulence and noise
- Noise-abating interior materials further quiet the cabin

The 2007 Sport Trac also features a host of improvements that are invisible to the eye, but instantly appreciated by the senses of hearing and touch. Every subsystem of the new vehicle has been tuned, engineered and redesigned to decrease noise, vibration, and harshness (NVH).

Occupants' ears will appreciate the dramatically quieter interior, with diminished wind, road, and tire noise. Their tactile senses will notice a lack of unwanted vibration in the contact surfaces such as the seats, steering wheel, and floorboards.

Although it shares many of the NVH enhancements introduced on the 2006 Explorer, the new Sport Trac presented its own NVH challenges, according to David McCreadie, Sport Trac vehicle NVH supervisor:

“Most sound you hear in the cab is high-frequency noise, which is intuitive: The farther you are away from it, the quieter the noise is. It makes a big difference in what you hear if your ear is four inches away from the rear glass versus three feet away from the rear glass.”

Fortunately, the Sport Trac benefits from a new frame offering a 444 percent increase in torsional stiffness compared to the outgoing Sport Trac. From that starting point, engineers painstakingly examined every subsystem of the new Sport Trac for opportunities to quell unwanted NVH.

As a result, the Sport Trac has one of the quietest interiors in its class. The road and tire isolation is particularly apparent during average-speed, coarse-road evaluations. Compared to the Honda Ridgeline, the Sport Trac is a full five decibels quieter at 40 mph (66.4 decibels compared to 71.4 for the Ridgeline).

### **Polite drivetrain components:**

For example, the stiffer frame enabled significantly softer engine mounts, isolating engine vibrations from intruding into the cabin. Both available engines also feature an additional exhaust resonator, improving the sound quality of the exhaust under heavy acceleration.

The standard 4.0-liter V-6 received a number of improvements, including a new camshaft and spark plugs. In addition, the idle speed has been lowered from 675 to 625 revolutions per minute. These cumulative changes have improved idle quality by 50 percent.

The new 4.6-liter V-8 benefits from three valves per cylinder and variable cam timing, improving performance, economy and refinement. Refinement is further improved by a larger airbox than before, delivering more air to the engine while decreasing induction noise. A new foam valley stuffer under the intake manifold's charge motion control valves helps muffle induction noise.

Due to the 16.8-inch longer wheelbase, the Sport Trac also features a longer, two-piece driveshaft that proved to be more susceptible to vibrations than the Explorer's shorter, single-piece component.

To solve the issue, engineers modified the forward two bushings supporting the rear differential. For manufacturing simplicity, the new bushings were adopted by the Explorer program, further enhancing the Explorer's driveline isolation.

### **New side mirrors actively prevent wind noise**

Exterior changes for improved interior NVH include side mirrors that are significantly larger than before for improved visibility, but actually reduce wind noise compared with both the old design and to tests conducted with no mirror at all.

“Not only are they bigger,” says McCreadie, “but they're also better in terms of how little noise they generate. The secret is in using the shape of the mirrors to manage the flow of air as much as possible. The mirror shell now actively prevents wind noise improving airflow around the vehicle profile.”

The team used extensive computer modeling and wind-tunnel testing to perfect the shape of the new mirrors. The “sail” that attaches the mirror to the door is both the correct distance and the correct angle in relation to the vertical edge of the mirror housing nearest the door. That vertical edge is parallel to the window glass, creating a smooth, continuous valley that doesn't disrupt airflow between the glass and mirror housing.

The forward surface of the mirror housing was also carefully shaped to minimize turbulence that would otherwise impact the window glass. Finally, the shape of the outermost portion of the housing was tuned to help direct air away from the vehicle.

### **Integrated air deflectors quiet cabin wind noise**

One of the unique challenges for the Sport Trac NVH team was air rushing up between the cabin and bed created unwanted wind noise in the cabin.

“Air was pushing up into the cabin's air extractors,” says McCreadie. “So we studied several different solutions to redirect air away from them.”

The solution was an elegant, no-cost addition to the bed headboard. The mold for the sheet-molded composite panel was modified to incorporate two blades, each shaped like an inverted “T.” These blades are approximately one inch tall, and help deflect air that would otherwise rush up from the undercarriage, or slide in sideways in the cabin's wake.

### **Noise-abating interior materials:**

For the interior, engineers employed a host of new materials to help insulate the cabin from unwanted noise:

- Additional insulation in the door panels and between the dash and firewall help prevent tire and powertrain noise from intruding into the cabin
- A layer of lightweight fiber batting in the headliner acts like a large acoustic tile, preventing sound from echoing off the roof and back into the cabin
- Even the Sport Trac's unique Tufloor™ rubber floor covering contributes to interior quietness, preventing road and tire noise from entering through the floorboards

### **About Ford Motor Company**

Ford Motor Company, a global automotive industry leader based in Dearborn, Mich., manufactures and distributes automobiles in 200 markets across six continents. With more than 327,000 employees and 110 plants worldwide, the company's core and affiliated automotive brands include Aston Martin, Ford, Jaguar, Land Rover, Lincoln, Mazda, Mercury and Volvo. Its

automotive-related services include Ford Motor Credit Company and Hertz. For more information regarding Ford's products, please visit [www.fordvehicles.com](http://www.fordvehicles.com).