SUMMARY FOR THE HANDBOOK OF AWARDS

1.-Title:

AMBULANCE SUSPENSION SYSTEM

(based on CREUAT SUSPENSION TECHNOLOGY)

2.-Logo:

3.-Human resources:

Project manager (Industrial Engineer)
Prototype manager (Industrial Engineer)
Prototype assistant (Technical Engineer)
Marketing and Strategy director (Economist)

4.-Company description:

The purpose of **Creuat, S. L**. is the development of a proprietary suspension system protected by several international patents. The technology has been developed in collaboration with very high-level race competition teams, and currently we are involved with some commercial projects collaborating with leader companies in the field of manufacturing of vehicles and suspension components that address the performance or specialty applications in the market.

5.-Project innovations:

Creuat has developed a new suspension system adapted to the rear axle of an ambulance. This is a passive interconnected suspension system designed to dynamically separate and optimize the elasticity and damping rates for roll and vertical movements. The **Creuat** design includes a hydraulic pump to adjust the ride height of the vehicle, and to lower it during load/unload operations.

Creuat introduces a completely novel **Suspension System,** a passive interconnected suspension designed to separate the elasticity and damping rates for each movement such as ROLL, PITCH, HEAVE and WARP. The **Creuat** design is simple and effective, avoiding the cost and complexity of active suspensions, or other look–a-like cross-linked systems. It provides a great deal of optimization of the suspension configuration to enhance handling, traction and corner grip without the usual tradeoffs found in conventional suspension.

Creuat has filed several international patents to protect its proprietary design.

6.-Project image:

7.-Project summary:

The company **Creuat, S. L.** is an engineering company created to develop and commercialize its own proprietary suspension system. In the last five years, the company has developed several prototypes for racing, 4x4 and ATV's vehicles.

Thanks to the acumulated experience along these years, **Creuat** has developed other systems for special vehicles, and in particular one for ambulances.

Ambulances are vehicles for transportation of injured or ill people. These are adapted over cab chassis actually designed for standard transportation. The volume and weight distribution makes ambulances a kind of vehicle with high roll inertia, impairing their stability in cases of cornering and street dodging.

A typical solution has been to make suspension stiffer, which dramatically impairs any measure of comfort for the patient and doctors inside the vehicle

Creuat's prototype is a variation of the system designed for rear axle-only application. This is a still totally passive system, interconnecting the two rear wheel suspension components in order to control the roll and vertical movements separately. This prototype incorporates as well two control elements:

- An hydraulic pump to control the ride height and allow easier access of patients and sanitary equipment
- A valve system that allows blocking the suspension to stabilize the vehicle when standing still over irregular terrains.

Separation of the suspension dynamic parameters permits a great deal of optimization of the suspension, which helps to the control of the vehicle without the tradeoffs of a simple suspension stiffness increase. In this way, we can increment the driving safety without any comfort tradeoff.

The company **Creuat S.L.** is the engineering company created to develop and commercialize its own proprietary suspension system. The project actually started in 1999 when the first patent was filed to protect the basic layout of our suspension system.

The concept of this suspension system can be compared to the active modal suspension developed by Lotus in the early 90s, and quickly banned in the F1 because of its superiority. The **Creuat** design is **simple and effective**, contains no sensors and no actuators, and the response is instantaneous. These advantages provide better stability and handling of the car without tradeoffs.

At the present time, we are involved in the development of several prototypes on very different types of vehicles, some of them in collaboration with very high-level race competition teams. Our system provides advantages for many vehicle types regarding grip and handling:

- ⇨ Off road and ATV projects: The system enhances stability and handling without impairing the off-road performance, specifically traction over the most rough conditions
- ⇨ Competition projects: The system increments the stability, corner grip and handling control in the extreme conditions when these parameters use to be mutually exclusive.

In all cases, the **Creuat Suspension System** provides:

- Increased traction, grip and braking capabilities due to more evenly distributed tire patch loads.
- Increase stability because of the specific stiffness for pitch and roll movements.
- Improve steering control over uneven surfaces and increase immunity against road bumps due to the low axle-crossing stiffness.
- No comfort tradeoffs thanks to the low vertical stiffness settings.