



## **FHI Reveals the Next Generation “EyeSight”**

### **- All-New Stereo Camera Recognition Technology and**

### **Added Steering Assist Control for Better Safety and Further Reduced Driver’s Workload -**

Tokyo, October 2, 2013 – Fuji Heavy Industries Ltd. (FHI), the manufacturer of Subaru automobiles, has developed its next generation “EyeSight” advanced driving assist system to enhance safety performance and further reduce burden on the driver. FHI has fully revamped the stereo camera system from current version of EyeSight for significantly improved recognition accuracy and added steering assist control features.

The next generation EyeSight adopts the revamped stereo camera system enhanced with color recognition technology combined with an approximately 40% increase of viewing angle and visibility distance, expanding visible range, improving object recognition accuracy, and allowing it to recognize brake lights and red signals. The changes are an upgrade to all the basic EyeSight functions of avoiding collisions, reducing collision damage and reducing driver’s workload.

A new feature “Active Lane Keep System” has two functions. One is “Lane Keeping Assist” which recognizes the lines on both sides of the lane and has steering assist controls to keep the driver in the middle of the lane. The other one “Lane Departure Prevention Assist” will apply force to the steering wheel to suppress the deviation if the vehicle almost strays over the lane lines, enabling to further reduce the burden of driving. In addition, with color recognition for the stereo camera, EyeSight can detect brake lights of the vehicle ahead and link it to “Adaptive Cruise Control”, allowing even faster deceleration when following vehicles compared to current performance.

The current EyeSight is a system that uses only stereo cameras to measure distances and recognize objects. Just as a driver senses much information visually, it can recognize things like other vehicles, pedestrians, bicycles, motorcycles and lane lines, and also control the vehicle. Moreover, it includes multiple driver assistance features, such as “Pre-Collision Braking Control” to slow or stop the vehicle with automatic braking. Affordably priced at 100,000 JPY (tax excluded), EyeSight is a very popular feature with customers. The accumulated sales of the EyeSight-equipped models have surpassed 150,000 units<sup>\*1</sup> in Japan.

FHI is advancing the development for an achievement of “autonomous driving” as a safety technology to prevent traffic accidents aiming for zero accidents by automobiles. FHI is now one step closer to this goal with the new EyeSight system. Under the “Confidence in Motion” brand statement, FHI will continue to offer Subaru’s distinctive “Enjoyment and Peace of Mind” driving experience through its commitment to safety represented in the EyeSight technology as well as its continued pursuit of driving excellence.

The functions of newly-developed next generation EyeSight will be employed on new vehicles scheduled for release in Japan in 2014, rolled out to all models sequentially.

<sup>\*1</sup> According to in-house research (As of end of Sept. 2013)

[Next generation EyeSight Features]

<Active Lane Keep System> (New)

- Lane Keeping Assist

If EyeSight can recognize the lines on both sides of the lane when driving above approximately 65 km/h with Adaptive Cruise Control activated, it will automatically steer the vehicle to keep it in the middle of the lane. This greatly reduces the burden on the driver and supports stable driving. The system determines whether the driver is operating the steering wheel or not and if not in operation, it will turn this feature off.

- Lane Departure Prevention Assist

If the vehicle is straying from the lines when driving over approximately 65 km/h as on limited-access highways, EyeSight will display and sound the lane departure warning and apply torque to the steering wheel to correct steering back to the center of the lane and suppress lane deviation.

<Pre-Collision Braking Control>

- The relative speed at which automatic braking is possible to avoid a collision between the vehicle and an object or reduce damage has been increased to approximately 50 km/h.
- By expanding visible range, stereo cameras can detect pedestrians crossing a street and pre-collision braking is applied at an earlier stage, enhancing performance of pedestrian protection.

<Adaptive Cruise Control> (Brake light recognition: New)

- The stereo cameras have been improved to increase response to acceleration and deceleration by the vehicle ahead, as well as improved performance in terms of tracking merging vehicles ahead and corners.
- With color recognition for the stereo cameras, EyeSight can detect brake lights of the vehicle ahead and link it to Adaptive Cruise Control, allowing even faster deceleration when following vehicles.

<Pre-Collision Reverse Throttle Management> (New)

If the system detects sudden accelerator input when in reverse, it displays and sounds a warning on sudden unintended acceleration and overrides the throttle to restrict abrupt driving in reverse.

<Hazard Avoidance Assist> (New)

If the system determines that collision with another vehicle or other obstacle in front of the vehicle is possible, it will assist the driver in steering to avoid the collision with integrated vehicle control technology in the VDC.

Note: The names of new functions are tentative.

Note: The performance of features above may diminish due to factors such as road, weather, and vehicle conditions.

[List of new EyeSight features \*2]

Highlighted: New functions

Stereo Camera Features

Recognition	Next Generation	Current model
	Color	Black / white
Signals	○	×
Brake lights	○	×
Lanes	○	○
Vehicles	○	○
Motorcycles / scooters	○	○
Bicycles	○	○
Pedestrians	○	○

EyeSight Features

Feature	Next Generation	Current model	Feature Description
Pre-Collision Braking Control	○ Relative speed*3<50km/h	○ Relative speed*3<30km/h	Uses a following distance warning feature to warn the driver to take evasive action when there is the possibility of a collision with a vehicle or obstacle in front of the driver's vehicle. If the driver still does not take evasive action, the brakes are quickly applied automatically just before the collision in order to reduce the collision damage or, if possible, prevent the collision.
Pre-Collision Brake Assist	○ Relative speed*3<70km/h	○ Relative speed*3<50km/h	Assists the driver in braking when there is a risk of collision. Increases braking power to avoid collisions and/or reduce damage.
Hazard Avoidance Assist	○	×	Same as above.
Adaptive Cruise Control	○ (0 – 100 km/h)		Maintains the set vehicle speed and when there is a vehicle in front in the same traffic lane, it tracks the speed of the vehicle in front up to the maximum of the set vehicle speed.
Active Lane Keep System (Lane Keeping Assist)	○	×	Same as above.
Active Lane Keep System (Lane Departure Prevention Assist)	○	×	Same as above.
Pre-Collision Throttle Management	○	○	Reduces accidental forward movement caused by the accelerator pedal being accidentally depressed, or depressed too strongly. Engine power output is restricted with warning displays and sounds while detecting obstacles in front of the vehicle.
Pre-Collision Reverse Throttle Management	○	×	Same as above.
Vehicle Distance Warning	○	○	Sounds a warning with the possibility of collision when too close to the vehicle ahead or a vehicle suddenly merges.
Lane Departure Warning	○	○	Sounds and displays a warning if the vehicle strays from the lane when driving above approx. 40 km/h.
Lane Sway Warning	○	○	Sounds and displays a warning if the vehicle detected swaying when driving at high speed (above approx. 50 km/h).
Lead Vehicle Start Alert	○	○	Sounds and displays an alert if the vehicle does not start when the vehicle ahead has started and is more than three meters away.

\*2 Notes:

- The names of new functions are tentative.
- The performance of features above may diminish due to factors such as road, weather, and vehicle conditions.
- Some features will differ by model or market.

\*3 The functions do not work at relative speeds above the indicated limits.

###