

Informal document No. GRRF-60-20
(60th GRRF, 18-22 September 2006
agenda item 6.1.)



ELECTRONIC STABILITY CONTROL

NHTSA's Notice of Proposed
Rulemaking

Briefing for WP.29/GRRF

September, 2006

ESC Briefing Outline

■ TECHNICAL:

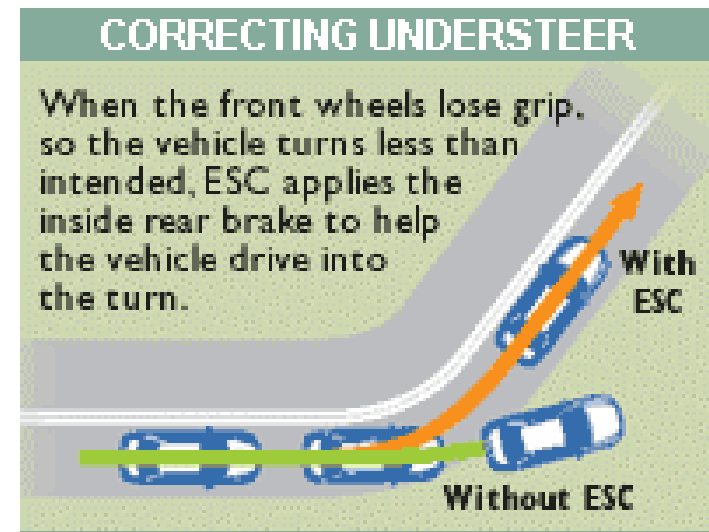
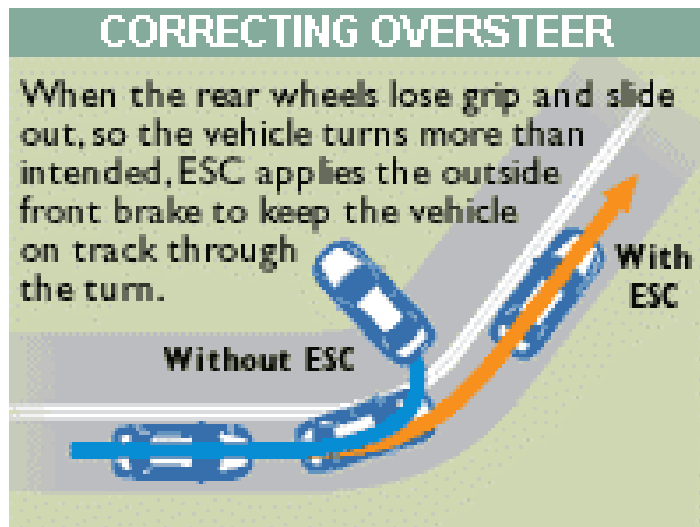
- . What is it and how does it work?
- . What vehicles have it now?
- . What has been industry involvement?

■ NPRM:

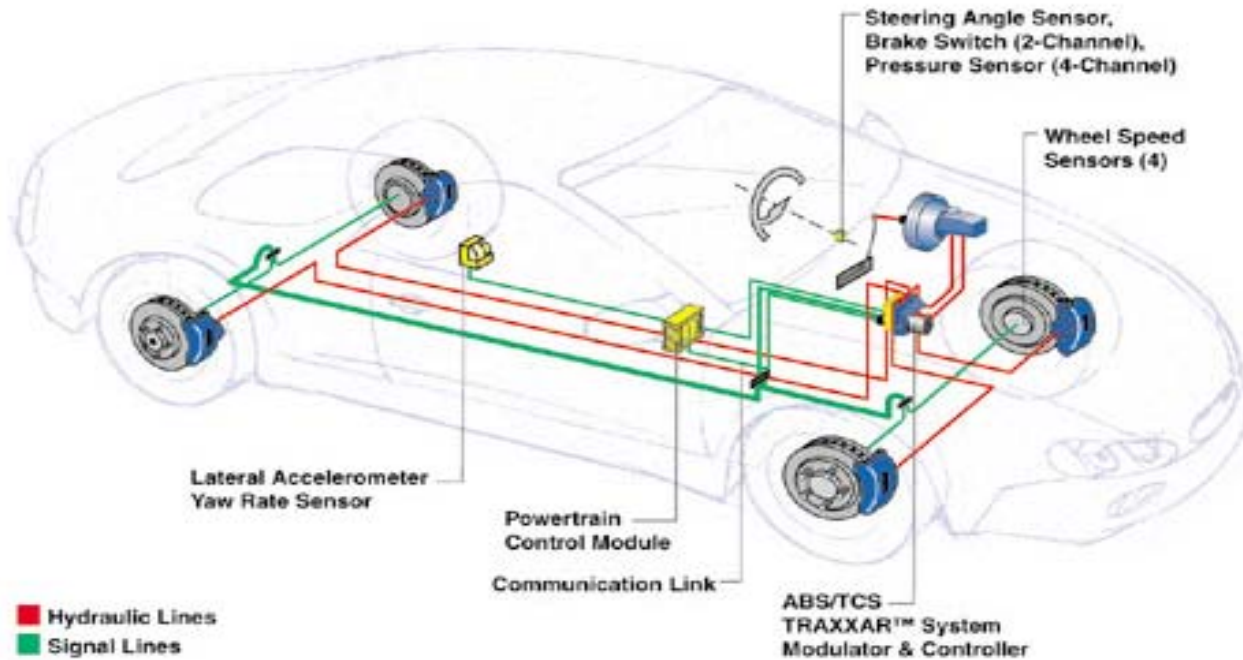
- . What are the requirements?
- . What is the scope - vehicles covered?
- . What are the cost and benefits?
- . What are the alternatives?
- . What is the proposed Phase-In?

What is ESC?

- System of sensors, actuators, and computers to enhance vehicle directional stability – prevent loss of control due to oversteer (spin-out) or understeer (plow-out)

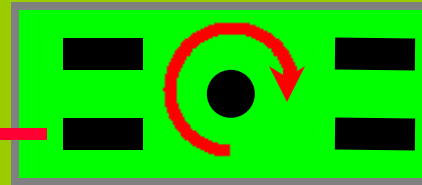


Basic Components of ESC



How Does ESC Work

Under-steer Correction



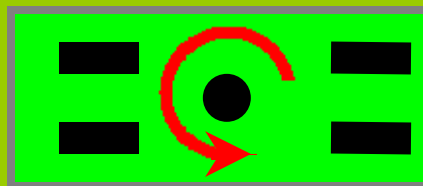
Under-steer Path

Obstacle



Desired Path

Over-steer Path

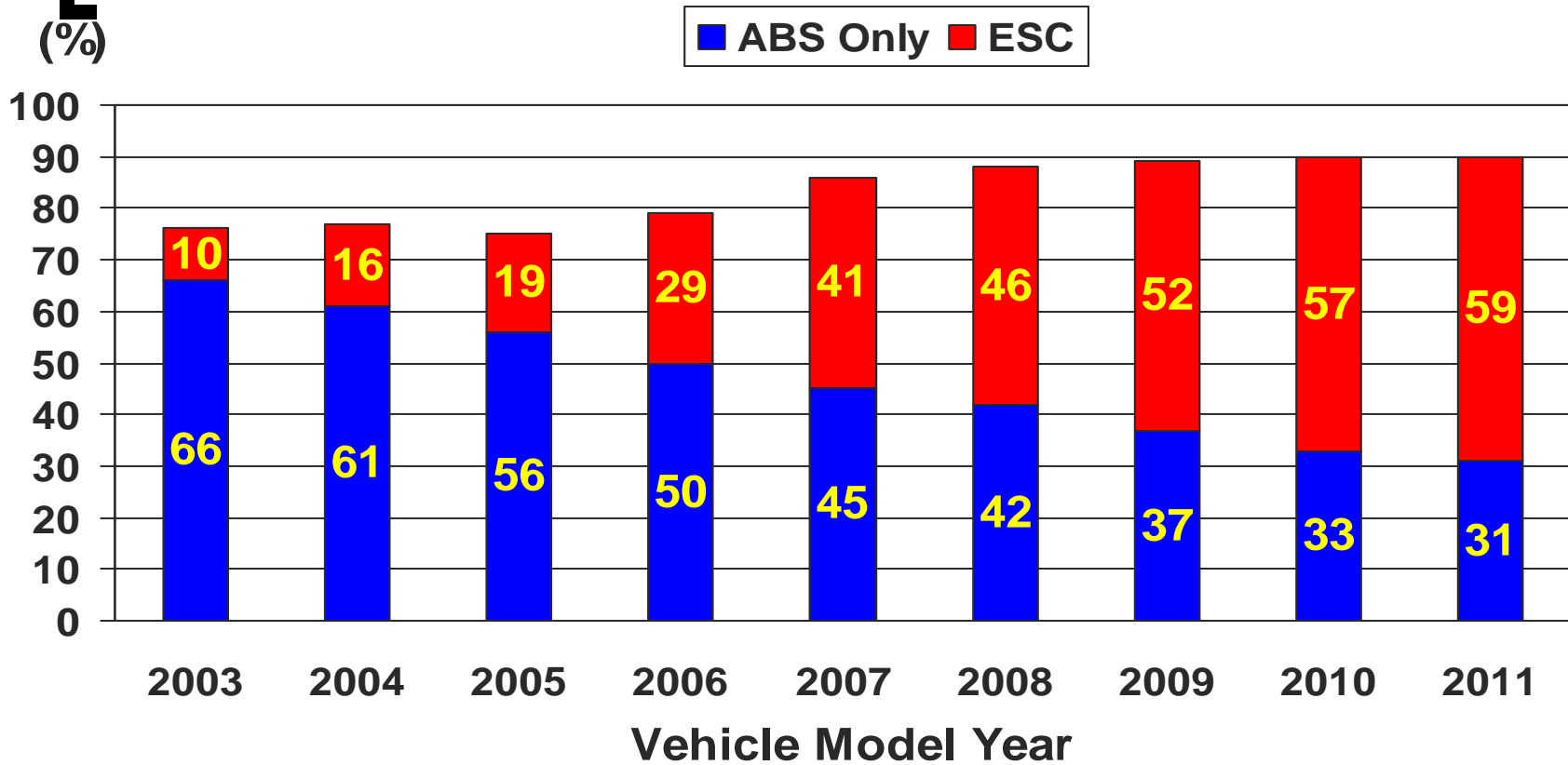


Over-steer Correction

Current State of ESC Implementation

- Available as standard equipment on many SUVs, luxury vehicles, and a limited number of small size sedans.
- Optional on a small number of other make/models.
- In 2006 we estimate the ESC penetration at about 29 percent.

Estimated ABS and ESC Installations



- GM to have 100% ESC by 2010 & Ford 100% ESC on all SUVs by 2008

International Studies on the Effectiveness of ESC

- Eight studies of ESC effectiveness have been conducted since 2003 - Japan, Germany, Sweden, and US
- Studies show consistently that ESC is highly effective in reducing all single vehicle crashes
- Typical reductions in fatal crashes for passenger vehicles are 30-40% and 50-63% for SUVs

ESC Effectiveness

INSURANCE INSTITUTE
FOR HIGHWAY SAFETY

“Very few safety technologies show this kind of large effect in reducing crash deaths”, Susan Ferguson, Senior Vice President for Research, IIHS June 13, 2006.

“If all vehicles were equipped with ESC, as many as 10,000 Fatal crashes could be avoided each year.” – IIHS News Release June 13, 2006



“It looks like Electronic Stability Control is the most significant safety advancement since safety belts”, Robert Lange, Executive Director of GM Safety Center, June 12, 2006

Industry Cooperation In Pre-Regulatory Test Program

- Auto industry contributed vehicle test data to NHTSA's ESC testing program – data is available in the public docket
- Of the 50 vehicles NHTSA desired to obtain test data on, 26 were provided by auto industry members

SAFETEA-LU Requirements

- Legislation enacted on August 10, 2005.
- Directs Secretary of Transportation to issue an NPRM to mandate stability enhancing technologies (ESC) by October 1, 2006, and a Final Rule by April 1, 2009.

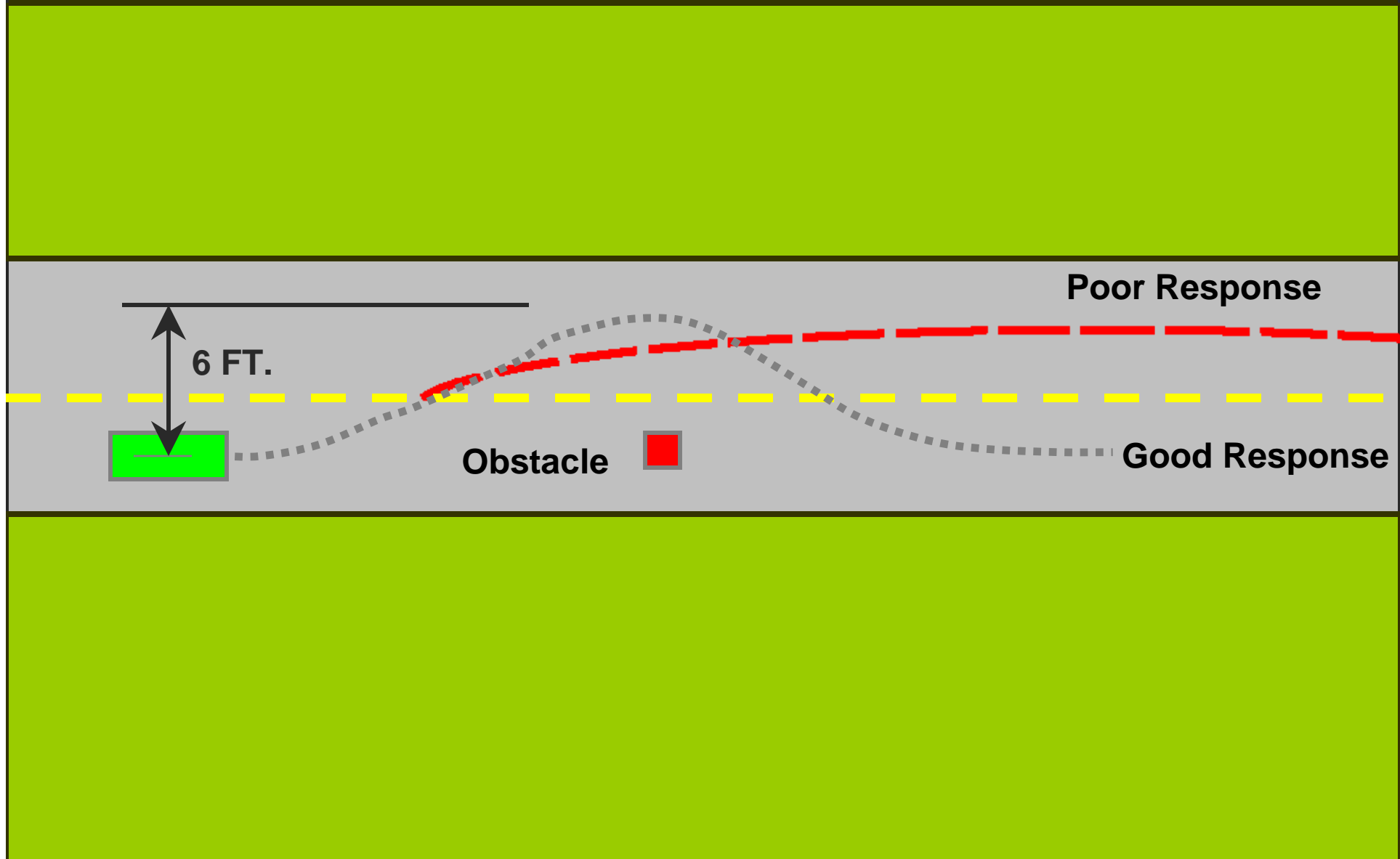
ESC Rule Scope

- All Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses with a GVWR of 4,536 Kilograms(10,000 pounds) or less.

What are the Requirements?

- Vehicle with ESC must execute a specified collision avoidance maneuver without spin-out (stability criterion).
- Vehicle with ESC must achieve a 6 foot lateral displacement at a specified time in the maneuver (responsiveness criterion).
- Vehicles with ESC must meet an equipment definition- independent braking, computer controlled, closed loop system, yaw rate sensor, monitor driver inputs, operates over all highway speeds, may have low speed cutout.

Responsiveness Criterion



Baseline Data for Estimating Costs and Benefits

- 29 Percent of 2006 MY passenger vehicles will be equipped with ESC compared to 10 percent in MY 2003.
- Manufacturer's confidential product plans provided to NHTSA indicate that 59 percent of MY 2011 light vehicles will have ESC (Does not include Honda, Hyundai, or Toyota).
- MY 2011 ESC will meet NHTSA requirements since vast majority of 2006 ESC met the definitional and test requirements.
- Projected MY 2011 installation rates serve as baseline for voluntary compliance.
- The PRIA estimates the incremental benefits and costs required to increase compliance from 59 to 100 percent .

Effectiveness of ESC

- NHTSA estimates that ESC will reduce single-vehicle crashes by 34 percent for passenger cars and by 59 percent for SUVs.
- ESC effectiveness is particularly high for single-vehicle crashes resulting in rollover. NHTSA estimates this to be 71 percent for passenger cars and 84 percent for SUVs.

Projected Gross Benefits

- We project that 100 percent ESC installation on all light vehicles would...
 - Prevent 5,300 to 10,300 fatalities annually.
 - Prevent 168,000 to 252,000 injuries (AIS 1-5).

Projected Net Benefits

- We estimate the incremental benefits that can be attributed to this rulemaking to be...
 - 1,536 to 2,211 lives saved annually.
 - The prevention of 50,594 to 69,630 injuries per year (AIS 1-5).

NHTSA Cost Tear Down Study

- Consumer Cost of ABS - \$368/Unit
- Consumer Cost of ESC - \$111/Unit
- Based on 8 Vehicles

Vehicle Costs for ESC Proposal (2005 \$)

	Ave. Vehicle Costs	Total Costs
Passenger Cars	\$90.3	\$728 M
Light Trucks/Vans	\$29.2	\$363 M
Total	\$58	\$985 M

ESC Systems Are Cost Effective

- \$0.19 to \$0.32 million per equivalent life saved (at a 3 percent discount rate).
- Compare to FMVSS No. 202 (head restraints safety improvements), which is estimated to cost 2.61 million per life saved.
- And FMVSS No. 208 (center seat shoulder belts), which costs 3.39 to 5.92 million per life saved.

What Are the Alternatives?

- **Limiting the applicability to light trucks/vans**
 - Not chosen because:
 - Would save 956 fewer lives
 - Would reduce injuries benefits by 34,902
 - Requirement for passenger cars is highly cost-effective
 - \$0.3 million per equivalent life saved (3% disc. rate)
- **Lower performance system – 2 channel versus 4 channel**
 - Technology only used once (on a GM vehicle) and then discontinued.
 - Does not handle understeer crashes – a significant portion of the benefits.

What Is the Phase-In?

- **Sept. 1, 2008** **30% of fleet - with carryover credit**
- **Sept. 1, 2009** **60% of fleet - with carryover credit**
- **Sept. 1, 2010** **90% of fleet - with carryover credit**
- **Sept. 1, 2011** **All light vehicles**

- **Exemption from Phase-in**
 - ➔ Multi-stage vehicle manufacturers and alterers are allowed to fully comply with the standard on September 1, 2012.
 - ➔ Small Volume (< 5,000/Year) are allowed to fully comply with the standard on September 1, 2011.



Thank You

Please direct you comments to:

<http://dms.dot.gov>

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