

Petition for Rulemaking to Require Standardized Exterior Propulsion-Type Identification for Covered Motor Vehicles

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This petition requests that NHTSA initiate rulemaking to establish a performance-based, technology-neutral requirement for covered motor vehicles to communicate propulsion class externally and uniformly, so first responders can recognize propulsion type at first approach.

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1. Executive Summary

This petition requests that the National Highway Traffic Safety Administration initiate rulemaking requiring covered motor vehicles to communicate propulsion class through a standardized, externally perceivable, performance-based method. The safety problem is practical: in the first moments of a crash, fire, entrapment, towing event, or post-incident response, responders often cannot determine propulsion type quickly, from approach distance, and under real emergency conditions.

That gap matters because propulsion systems can create different responder-relevant hazards and tactical implications. Internal combustion, hybrid, plug-in hybrid, battery electric, and fuel-cell vehicles do not always permit the same assumptions for approach, suppression, extrication, isolation, towing, storage, or post-incident handling. Electrified propulsion, in particular, may present high-voltage exposure, stranded energy, off-gassing, thermal runaway, delayed reignition, and related concerns.

Current identification methods do not reliably solve the first-moment recognition problem. Existing badging is inconsistent, manufacturer-dependent, subtle, damage-prone, and often designed for consumer branding rather than emergency hazard communication. VIN lookup, rescue sheets, QR tools, proprietary applications, paperwork, and model familiarity may help later, but they are not substitutes for immediate exterior recognition in darkness, smoke, weather, crash debris, traffic, or other degraded conditions.

The requested rule is narrow. It does not ask NHTSA to prescribe a proprietary product, regulate battery chemistry, or standardize suppression doctrine. It asks only that covered vehicles communicate propulsion class externally, visibly, and uniformly enough to support first-approach recognition.

The standard can remain objective, practicable, and performance-based. NHTSA can define covered propulsion classes, placement or allowable zones, visibility and recognizability conditions, durability criteria, and compliance lead time while leaving manufacturers flexibility to choose the final design.

2. Petitioner and Basis for Petition

2.1. Current Role

The Petitioner is a career fire-service leader currently serving as a Battalion Fire Chief with the Newark Department of Public Safety, Fire Division. He also serves in hazardous-materials, training, special-operations, and New Jersey UASI Fire CBRNE leadership roles, and as a New Jersey State Certified Fire Instructor Level 2. His duties include responder safety, incident command support, public protection, force protection, decontamination, environmental monitoring, scene management, training, and resource planning for high-risk fire, hazardous-materials, and CBRNE response operations.

The Petitioner submits this petition strictly in his individual capacity. His title, assignments, certifications, and fire-service experience are provided solely to establish the basis for his knowledge, observations, and safety concerns. The Petitioner does not submit this petition on behalf of the Newark Department of Public Safety, Fire Division, the City of Newark, New Jersey UASI, any command staff, or any affiliated public agency. Nothing in this petition should be interpreted as an official position, policy recommendation, endorsement, authorization, or representation of any department, employer, municipality, or governmental entity. The opinions, observations, and recommendations expressed in this petition are those of the Petitioner alone and are based on his training, experience, and professional judgment.

2.2. Training and Response Background

The Petitioner brings more than three decades of progressive fire-service experience, including service as a dispatcher, firefighter, fire captain, battalion chief, hazardous-materials responder, instructor, and command-level leader. His background includes fireground operations, hazardous-materials response, technical rescue, vehicle extrication, incident safety, emergency scene documentation, responder-safety decision-making, and command supervision in routine and high-risk environments. He has practical familiarity with how electric, hybrid, fuel-cell, gaseous-fueled, and lithium-ion battery technologies can affect size-up, suppression, extrication, EMS interface, towing, storage, and post-incident management.

2.3. Purpose of the Filing

The Petitioner files this petition because the problem is operationally real and growing. As battery-electric, hybrid, plug-in hybrid, and other alternative-propulsion vehicles enter service, responders increasingly face immediate life-safety decisions without a uniform way to identify propulsion type from approach distance.

Propulsion type can affect hazard recognition, tactical posture, suppression, extrication, isolation, towing, and post-incident handling. Existing badging, model familiarity, VIN methods, paperwork, and other indirect cues are inconsistent, often obscured, and not designed for first-arrival emergency recognition.

This filing therefore seeks a practical hazard-communication improvement: standardized, scene-visible propulsion-type identification that reduces avoidable uncertainty when responders most need clarity.

2.4. Public-Interest Basis

This petition addresses a growing safety gap affecting emergency response, occupant protection, and hazard recognition in a more diverse vehicle fleet. As propulsion technologies evolve, safety communication should evolve with them so responders are not left to rely on guesswork, close inspection, or manufacturer-specific cues during first arrival.

The petition is not anti-technology or anti-electrification. It asks for a nationally intelligible exterior signal that helps firefighters, EMS, law enforcement, towing operators, and downstream responders recognize propulsion class quickly enough to make better safety decisions.

3. Requested Rulemaking

The Petitioner respectfully requests that NHTSA initiate rulemaking requiring covered motor vehicles to communicate propulsion class through standardized, externally perceivable, performance-based means. The purpose is to allow first responders and other emergency personnel to recognize propulsion class quickly, reliably, and without guesswork during the initial moments of an incident.

The requested action is directed at hazard recognition, operational clarity, and public safety, not marketing, consumer branding, or aesthetics. In a fleet containing internal combustion, hybrid, plug-in hybrid, battery electric, and other alternative-propulsion vehicles, propulsion type can materially affect approach, suppression, extrication, isolation, towing, storage, and post-incident handling.

The Petitioner does not ask NHTSA to mandate a proprietary product, require disclosure of proprietary powertrain design, prescribe a suppression doctrine, or resolve every implementation detail at the petition stage. The request is for a performance-based safety requirement with objective and enforceable criteria.

At a minimum, the rulemaking should consider a performance standard requiring propulsion class to be communicated externally in a manner that:

- communicates propulsion class in a uniform, nationally intelligible manner;
 - is visible from a specified responder approach distance;
 - is recognizable under daylight and night/low-light conditions;
 - is recognizable from common responder approach angles;
 - is placed in standardized or limited allowable exterior zones;
 - is durable enough to remain usable during the initial phase of post-crash and emergency response; and
 - is expressed in objective, practicable, and enforceable performance terms.

A reasonable initial scope would apply prospectively to new covered motor vehicles after an appropriate compliance date. The rulemaking should at least address internal combustion, hybrid and plug-in hybrid, and battery electric vehicles, while allowing NHTSA to determine whether hydrogen fuel-cell or other emerging architectures should be included initially or later.

This petition does not ask NHTSA to replace VIN data, emergency response guides, rescue sheets, telematics, QR-linked resources, or similar secondary systems. Those tools may remain useful after the vehicle has been identified and the scene permits their use. The petition addresses the earlier gap: first approach, before responders can safely rely on close inspection or downstream tools.

For these reasons, the Petitioner requests that NHTSA begin rulemaking, through a new or amended FMVSS as the agency deems appropriate, to establish a narrow, practical, nationally consistent propulsion-identification requirement for covered motor vehicles.

4. Safety Problem

When responders arrive at a vehicle incident, they must make high-consequence decisions before all facts are known. In the first moments of a crash, fire, entrapment, roadside disablement, towing event, or post-incident hazard scene, they may need to determine approach, apparatus placement, PPE posture, evacuation or isolation, suppression, extrication, and downstream towing or storage precautions under time pressure and unstable conditions.

Those decisions increasingly occur in an environment where propulsion type may not be obvious. A responder may know that a vehicle is damaged, smoking, burning, disabled, overturned, or occupied, but not whether it is conventional, hybrid, plug-in hybrid, or battery electric. That uncertainty matters because propulsion type can materially change the hazard profile and tactical posture, especially where electrified propulsion may involve stranded energy, high voltage, thermal runaway, toxic or flammable off-gassing, violent venting, delayed reignition, or no-cut-zone concerns.

This uncertainty is especially consequential for lithium-ion battery systems. Damaged high-voltage battery packs can retain stranded energy, create shock risk after apparent shutdown, and reignite after initial suppression if energy remains in damaged systems. NHTSA guidance likewise warns that damaged high-voltage batteries may release toxic or flammable gases and fire immediately or later.¹

Responders do not make these decisions in ideal visibility or with time for careful inspection. They operate in darkness, weather, smoke, debris, traffic, noise, limited staffing, and uncertainty about occupant condition and scene stability. They may need to act before they can safely inspect badges, read labels, perform VIN lookup, access a guide, or confirm propulsion through secondary means.

The consequences are operational. Ambiguity can delay proper size-up, trigger unnecessary hesitation, or encourage overly aggressive tactics where caution is warranted. It can affect standoff, approach, extrication commitment, suppression posture, public protection, and downstream handling by EMS, tow operators, investigators, and storage personnel. The inability to identify propulsion type at first approach is therefore not a mere informational inconvenience; it is avoidable operational uncertainty at the moment responders most need clarity.

¹ National Transportation Safety Board, Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles, Safety Report NTSB/SR-20/01, at 57, 68–73 (2020); National Highway Traffic Safety Administration, Interim Guidance for Electric and Hybrid-Electric Vehicles Equipped With High-Voltage Batteries (Law Enforcement / Emergency Medical Services / Fire Department), DOT HS 811 575 (Mar. 2014); National Highway Traffic Safety Administration, Interim Guidance for Electric and Hybrid-Electric Vehicles Equipped With High-Voltage Batteries (Towing and Recovery Operators and Vehicle Storage Facilities), DOT HS 811 576 (Mar. 2014).

4.1. Propulsion Type Is Not Reliably Identifiable at a Glance and Distance

Propulsion type is not reliably identifiable at a glance, from approach distance, or under real emergency conditions. Some vehicles carry badges, model names, trim designations, or other manufacturer-selected cues, but those cues are not a uniform, responder-oriented safety system. They vary by manufacturer, product line, model year, and vehicle class, and are generally designed for branding rather than emergency hazard communication.

That lack of uniformity is itself a safety problem. Responders should not have to decode styling choices, remember model-specific naming conventions, or infer propulsion type from subtle visual details. A national safety system cannot depend on localized familiarity, individual experience, or brand knowledge.

The older assumption that a vehicle's appearance roughly explains its hazard profile is becoming less reliable. Outwardly similar vehicles may conceal materially different propulsion systems and energy-storage configurations. That is a communication deficit in the vehicle environment, not a knowledge deficit by responders.

Current cues may be absent, ambiguous, misleading, or too small to be useful from approach distance. Where no standardized propulsion-class signal exists, responders are forced to infer hazard from branding, trim language, or partial visual cues that were never designed for emergency use.

Existing cues are also poorly suited to emergency recognition. They often require close inspection of a badge, emblem, model mark, or small body feature, but close inspection may be unrealistic or unsafe during initial size-up.

Whatever cues exist are vulnerable to the incident itself. Crash damage, fire, soot, shattered components, roadway debris, darkness, glare, smoke, steam, weather, and vehicle orientation can obscure or destroy the markings responders might otherwise use.

The current identification framework is therefore misaligned with emergency use: inconsistent where it should be standardized, subtle where it should be obvious, and fragile where it should be resilient.

4.2. Different Propulsion Systems Create Different Hazard and Tactical Profiles

Different propulsion systems do not present the same hazard picture or permit the same assumptions. Conventional, hybrid, plug-in hybrid, and battery electric vehicles may appear similar in ordinary roadway use, but they can differ significantly in responder-relevant hazards during and after an incident.²

² National Transportation Safety Board, Safety Risks to Emergency Responders from

Conventional internal combustion vehicles present a more familiar response profile. Electrified propulsion systems add considerations that may not be visible externally but can affect approach, suppression, extrication, air monitoring, overhaul, towing, storage, and public protection.

Battery systems can differ substantially from conventional vehicle fires or crashes. NTSB identified thermal runaway and multiple reignitions after initial suppression as safety risks in high-voltage lithium-ion battery fires tied to stranded energy. NHTSA guidance similarly warns responders to assume damaged high-voltage batteries remain energized and to account for toxic and flammable venting gases.³

These differences also translate into operational burdens, including greater cooling and monitoring needs, hazardous off-gassing, contaminated runoff, and prolonged towing or storage precautions after battery involvement. Controlled testing and recent lithium-ion firewater-runoff studies, including studies outside the passenger-vehicle context, document hydrogen fluoride emissions and contaminants relevant to responder protection and downstream scene management.⁴

Recent full-scale and post-fire contamination studies reinforce that electrified propulsion can create responder-relevant hazards and post-suppression burdens that differ from the conventional vehicle baseline, even though not every incident unfolds identically.⁵

Lithium-Ion Battery Fires in Electric Vehicles, Safety Report NTSB/SR-20/01, at 57, 68–73 (2020); National Highway Traffic Safety Administration, Interim Guidance for Electric and Hybrid-Electric Vehicles Equipped With High-Voltage Batteries (Law Enforcement / Emergency Medical Services / Fire Department), DOT HS 811 575 (Mar. 2014); U.S. Fire Administration & National Highway Traffic Safety Administration, Electric Vehicle Fire/Rescue Response Operations (2025).

³ National Transportation Safety Board, Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles, Safety Report NTSB/SR-20/01, at 57, 68–73 (2020); National Highway Traffic Safety Administration, Interim Guidance for Electric and Hybrid-Electric Vehicles Equipped With High-Voltage Batteries (Law Enforcement / Emergency Medical Services / Fire Department), DOT HS 811 575 (Mar. 2014).

⁴ Fredrik Larsson, Petra Andersson, Per Blomqvist & Bengt-Erik Mellander, Toxic Fluoride Gas Emissions from Lithium-Ion Battery Fires, 7 Scientific Reports 10018 (2017); Fredrik Larsson et al., Characteristics of Lithium-Ion Batteries During Fire Tests, 271 Journal of Power Sources 414 (2014); Arnaud Bordes et al., Assessment of Run-Off Waters Resulting from Lithium-Ion Battery Fire-Fighting Operations, 10 Batteries 118 (2024); Homam Jalali, Lyndon Collie & Saeid Baroutian, Air Emissions & Firewater Runoff Contamination from Lithium-Ion Battery Fires in Rubbish Trucks, 389 Environmental Pollution 127437 (2026) (controlled rubbish-truck/waste-stream lithium-ion battery fire trials).

⁵ Richard M. Kesler et al., Evaluation of Combustion Products in Air from Electric and Internal Combustion Engine Vehicles During Full-Scale Fire Experiments, 158 Fire Safety Journal 104558 (2025); Marcel Held et al., Thermal Runaway and Fire of Electric Vehicle Lithium-Ion Battery and Contamination of Infrastructure Facility, 165 Renewable and Sustainable Energy Reviews 112474 (2022); Fredrik Larsson, Petra Andersson, Per Blomqvist & Bengt-Erik Mellander, Toxic Fluoride Gas Emissions from Lithium-Ion Battery Fires, 7 Scientific Reports 10018 (2017).

Hybrids and plug-in hybrids add complexity because they may combine liquid-fuel hazards and battery-system hazards in one incident. NHTSA guidance directs responders to determine whether a vehicle is electric or hybrid-electric and warns that exposed electrical components and damaged high-voltage batteries can present shock, gas-release, and delayed-fire hazards.⁶

These distinctions matter because they affect apparatus placement, approach angle, personnel commitment, hot zones, occupant protection, hose deployment, air monitoring, EMS briefing, and recovery coordination.

4.3. Ambiguity Causes Delay, Error, and Elevated Risk

Ambiguity in propulsion identification is an operational safety problem. When responders cannot quickly determine whether a vehicle is conventional, hybrid, plug-in hybrid, or battery electric, they may be delayed in adopting the correct tactical posture when time matters most.⁷

That ambiguity creates a tactical dilemma. If responders assume a conventional profile and close too quickly, they may increase exposure to high-voltage hazards, off-gassing, thermal escalation, or violent venting. If they slow down because electrified propulsion is suspected but unconfirmed, rescue, suppression, or extrication may be delayed while conditions worsen.⁸

In entrapment, smoke, fire, instability, or deteriorating occupant-condition scenarios, that uncertainty can affect survivability because responders may need to reassess cut zones, stabilization, approach, and battery-related risks before committing personnel.

Incorrect propulsion assumptions can expose responders and the public to the wrong hazards, including stranded energy, toxic and flammable gases, thermal runaway, delayed reignition, or the mixed liquid-fuel and battery risks associated with hybrids.⁹

⁶ National Highway Traffic Safety Administration, Interim Guidance for Electric and Hybrid-Electric Vehicles Equipped With High-Voltage Batteries (Law Enforcement / Emergency Medical Services / Fire Department), DOT HS 811 575 (Mar. 2014).

⁷ National Transportation Safety Board, Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles, Safety Report NTSB/SR-20/01 (2020); National Highway Traffic Safety Administration, Emergency Response Guides, <https://www.nhtsa.gov/emergency-response-guides>; U.S. Fire Administration & National Highway Traffic Safety Administration, Electric Vehicle Fire/Rescue Response Operations (2025).

⁸ National Highway Traffic Safety Administration, Interim Guidance for Electric and Hybrid-Electric Vehicles Equipped With High-Voltage Batteries (Law Enforcement / Emergency Medical Services / Fire Department), DOT HS 811 575 (Mar. 2014); National Transportation Safety Board, Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles, Safety Report NTSB/SR-20/01 (2020); Pipeline and Hazardous Materials Safety Administration, Safety Advisory Notice: Transportation of Electric Vehicles Containing Lithium Batteries Damaged by Extreme Weather Events (Apr. 7, 2023).

⁹ National Transportation Safety Board, Safety Risks to Emergency Responders from

This concern is acute because lithium-ion incidents can escalate rapidly and differ from conventional vehicle fires. NTSB, NHTSA, PHMSA, and responder literature recognize risks involving extreme heat, toxic or flammable gas release, stranded energy, sudden thermal escalation, venting, delayed reignition, and persistent transportation or storage concerns.¹⁰

Technical literature also indicates that lithium-ion battery failure can release toxic and corrosive gases and vapors, including hydrogen fluoride, hydrogen chloride, carbon monoxide, carbon dioxide, and electrolyte-derived vapors. Release timing and concentration can change with battery condition, failure mode, and state of charge.¹¹

That evolving hazard profile reinforces the need for earlier propulsion recognition before conditions are fully visible or stabilized.

4.4. Record Evidence Supporting the Safety Problem

NTSB's 2020 Safety Report confirms that the issue is not speculative. After examining three electric-vehicle crashes with fires and one non-crash fire, NTSB found that high-voltage lithium-ion battery fires pose electric-shock risk to responders and that damaged cells can enter thermal runaway, leading to reignition or fire from stranded energy. Those findings show that propulsion-related hazards are operationally significant and that the present information environment remains too dependent on downstream guidance rather than immediate scene-visible recognition.¹²

USFA's Electric Vehicle Fire/Rescue Response Operations guide reflects the same reality. It states that responders must continue to adapt strategies and tactics as evidence develops, notes that scientific research remains limited, and identifies continuing knowledge gaps. That reinforces both propositions at issue here: propulsion-related hazards require dedicated guidance, and current

Lithium-Ion Battery Fires in Electric Vehicles, Safety Report NTSB/SR-20/01 (2020); National Highway Traffic Safety Administration, Interim Guidance for Electric and Hybrid-Electric Vehicles Equipped With High-Voltage Batteries (Law Enforcement / Emergency Medical Services / Fire Department), DOT HS 811 575 (Mar. 2014); Agency for Toxic Substances and Disease Registry, Medical Management Guidelines for Hydrogen Fluoride (HF).

¹⁰ National Transportation Safety Board, Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles, Safety Report NTSB/SR-20/01 (2020); National Highway Traffic Safety Administration, Interim Guidance for Electric and Hybrid-Electric Vehicles Equipped With High-Voltage Batteries (Law Enforcement / Emergency Medical Services / Fire Department), DOT HS 811 575 (Mar. 2014); Pipeline and Hazardous Materials Safety Administration, Safety Advisory Notice: Transportation of Electric Vehicles Containing Lithium Batteries Damaged by Extreme Weather Events (Apr. 7, 2023); U.S. Fire Administration & National Highway Traffic Safety Administration, Electric Vehicle Fire/Rescue Response Operations (2025).

¹¹ Thermo Fisher Scientific, Analysis of Smoke Composition and Toxicity from Lithium-ion Battery Failure Using Real-Time FTIR Spectroscopy, Application Note MCS-AN1260-EN (Jan. 2025).

¹² National Transportation Safety Board, Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles, Safety Report NTSB/SR-20/01 (Washington, DC: National Transportation Safety Board, 2020).

response still depends on a complex, maturing information ecosystem rather than a simple first-approach signal.¹³

NHTSA's emergency-response infrastructure likewise treats propulsion and powertrain information as responder-relevant. NHTSA maintains manufacturer-submitted emergency response guides and rescue sheets for electric-powered passenger cars, multipurpose passenger vehicles, trucks, and buses, and its 2024 FMVSS No. 305a NPRM proposed requirements addressing rescue sheets and emergency response guides. That framework confirms the safety relevance of propulsion information while leaving the first-approach recognition gap unresolved.¹⁴

Governmental and peer-reviewed sources also show that lithium-ion incidents can produce consequences beyond flame spread alone, including hazardous fluoride-gas emissions, energetic rupture behavior, and contaminated firewater runoff. These sources reinforce that propulsion-related hazards can be severe, fast-changing, and operationally significant.¹⁵

Recent full-scale EV fire studies and broader firefighter exposure literature likewise report metal-enriched smoke particulates, fluoride enrichment, soot and surface contamination, and persistent contaminants on PPE or response surfaces, supporting the relevance of propulsion differences during overhaul, decontamination, towing, and post-incident handling.¹⁶

These authorities do not prove the final design of the requested rule. They do show a documented national safety problem involving propulsion-related hazard recognition and a gap left open by

¹³ U.S. Fire Administration and National Highway Traffic Safety Administration, *Electric Vehicle Fire/Rescue Response Operations* (2025).

¹⁴ National Highway Traffic Safety Administration, *Emergency Response Guides*, <https://www.nhtsa.gov/emergency-response-guides>; Federal Motor Vehicle Safety Standards; FMVSS No. 305a, *Electric-Powered Vehicles: Electric Powertrain Integrity*, 89 Fed. Reg. 26818 (Apr. 15, 2024).

¹⁵ Fredrik Larsson, Petra Andersson, Per Blomqvist & Bengt-Erik Mellander, *Toxic Fluoride Gas Emissions from Lithium-Ion Battery Fires*, 7 *Scientific Reports* 10018 (2017); Donal P. Finegan et al., *Identifying the Cause of Rupture of Li-Ion Batteries During Thermal Runaway*, 5 *Advanced Science* 1700369 (2018); Arnaud Bordes et al., *Assessment of Run-Off Waters Resulting from Lithium-Ion Battery Fire-Fighting Operations*, 10 *Batteries* 118 (2024); Homam Jalali, Lyndon Collie & Saeid Baroutian, *Air Emissions & Firewater Runoff Contamination from Lithium-Ion Battery Fires in Rubbish Trucks*, 389 *Environmental Pollution* 127437 (2026) (controlled rubbish-truck/waste-stream lithium-ion battery fire trials).

¹⁶ Yong Ho Kim et al., *Chemical Components of Electric Vehicle and Internal Combustion Engine Vehicle Fire Smoke and Their Mutagenic Effects*, 32 *Environmental Science and Pollution Research* 26629-26639 (2025); Marcel Held et al., *Thermal Runaway and Fire of Electric Vehicle Lithium-Ion Battery and Contamination of Infrastructure Facility*, 165 *Renewable and Sustainable Energy Reviews* 112474 (2022); Yulin Wu et al., *Understanding and Mitigating Contaminant Exposure in Firefighting: Comprehensive Review of Firefighter PPE on Contamination, Health Risks, and Decontamination Methods*, 1 *Occupational Health* 12 (2026), <https://doi.org/10.3390/occuphealth1010012>.

current rescue sheets, guides, and model-specific information systems, which generally require vehicle identification, document access, or close inspection before they can be used.

4.5. Quantitative Evidence of the Recognition Gap and Growing Exposure

Available quantitative evidence supports rulemaking without requiring NHTSA to find that electrified vehicles are more likely to crash or burn. The narrower point is that when an electrified vehicle is involved in a crash, fire, towing, storage, or post-incident response, responders may face propulsion-specific hazards, longer operational timelines, and greater dependence on accurate early identification.

DOE reports more than 5.8 million light-duty electric vehicles on U.S. roads and more than 1.4 million new EV purchases in 2023. DOE/AFDC model-availability data also show substantial growth in electrified light-duty offerings, including BEV offerings increasing from 20 in 2011 to 61 in 2024 and PHEV offerings increasing from 1 in 2011 to 54 in 2024, while HEV offerings totaled 41 in 2024. NHTSA separately estimated approximately 205 unique electric-powered vehicle models sold annually across covered categories. This growth makes propulsion recognition harder if it remains dependent on brand familiarity, subtle badging, VIN decoding, or vehicle-specific documents.¹⁷

Federal safety records show that propulsion-specific hazards can alter emergency and post-incident operations. In three high-severity EV crashes reviewed by NTSB, high-voltage batteries reignited at least 15 times in total. NTSB also noted emergency guidance identifying approximately 3,000 gallons of water as needed to cool a high-voltage lithium-ion battery and warning that reignition may occur if the battery is not completely cooled before transfer to secondary responders.¹⁸

State-level evidence points the same way. A 2025 Washington State Patrol EV fire study collected 120 stakeholder survey responses and found low self-rated preparedness across affected responder groups. It also reported that 62 percent of towing companies surveyed had no system to identify

¹⁷ U.S. Department of Energy, Strategy for Achieving a Beneficial Vehicle Grid Integration (VGI) Future (Jan. 2025), reporting more than 1.4 million new EV purchases in 2023 and more than 5.8 million light-duty EVs on U.S. roads; U.S. Department of Energy and U.S. Environmental Protection Agency, Fuel Economy data / Vehicle Technologies Office model-availability data, reflecting growth in available light-duty electric and hybrid-electric model offerings; Federal Motor Vehicle Safety Standards; FMVSS No. 305a, Electric-Powered Vehicles: Electric Powertrain Integrity, 89 Fed. Reg. 26818 (Apr. 15, 2024), estimating approximately 205 unique electric-powered vehicle models sold annually across covered categories.

¹⁸ National Transportation Safety Board, Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles, Safety Report NTSB/SR-20/01 (2020), including findings on electric shock hazards, thermal runaway, stranded energy, battery reignition, and emergency-response guidance addressing the amount of water and cooling needed before release to secondary responders.

electric vehicles involved in an accident and recommended a universal marker or identifying sticker for EVs or hybrids involved in collisions.¹⁹

Transportation operations data also support the need for earlier identification. A Virginia Transportation Research Council report found that EV fires present unique roadway incident-management challenges involving extended suppression durations, toxic emissions, and reignition risk, and reported a 42 percent increase in vehicle fires exceeding four hours between the periods reviewed. The report also noted that current records do not adequately identify propulsion type.²⁰

NHTSA's emergency-response information framework confirms that propulsion information is safety-relevant but not first-approach visible. Emergency response guides and rescue sheets are valuable, but they generally require make-and-model identification or document access after initial recognition has already begun.²¹

This quantitative record supports a practical conclusion: the fleet is becoming more diverse, electrified models are increasing, propulsion-specific hazards can materially affect emergency operations, and existing data systems do not capture the recognition problem cleanly. A standardized exterior propulsion-identification requirement would address that first-step recognition problem directly.

5. Why Current Identification Methods Are Inadequate

5.1. Inconsistent Manufacturer Badging

Existing badging is inconsistent across manufacturers, models, trims, and design philosophies. There is no universal responder-oriented convention for communicating propulsion type on the exterior of a vehicle; current cues generally reflect manufacturer choice, branding, styling, or product-line differentiation.

¹⁹ Washington State Patrol, Electric Vehicle Fires Study, SSB 5812 (2025), including survey findings regarding responder preparedness, towing-industry identification practices, and recommendations for a universal marker or identifying sticker for EVs or hybrid vehicles involved in collisions.

²⁰ Goodall, Noah J., Emergency Management Strategies for Electric Vehicles, Virginia Transportation Research Council Report No. 26-R30 / FHWA/VTRC 26-R30 (2026), reporting unique roadway incident-management challenges associated with EV fires, including extended suppression durations, toxic emissions, reignition risks, and a 42 percent increase in vehicle fires exceeding four hours between the periods studied.

²¹ National Highway Traffic Safety Administration, Emergency Response Guides, <https://www.nhtsa.gov/emergency-response-guides> (providing manufacturer-submitted emergency response guides and rescue sheets for battery-electric, hybrid-electric, plug-in hybrid-electric, and fuel-cell electric vehicles).

Propulsion-related cues are often discretionary, subtle, or embedded in consumer branding. Some vehicles communicate propulsion type clearly, some indirectly, and some not at all. A responder-oriented safety system cannot depend on whether a manufacturer chooses to make propulsion obvious, minimally visible, or effectively invisible.

The Mercedes-Benz G 580 with EQ Technology illustrates the issue. It is a fully electric G-Class with four electric motors and a high-voltage battery, yet its exterior presentation remains closely tied to ordinary G-Class styling and model-family nomenclature. The emergency-relevant fact is not brand heritage or trim strategy; it is that the vehicle is battery electric. Manufacturer-specific model language leaves that recognition burden on the responder.²²

5.2. Damage Obscuring Existing Identifiers

Even where a vehicle carries a cue suggesting propulsion type, that cue may not survive the incident. Front, side, rear, or rollover damage; fire exposure; soot; shattered components; roadway debris; and vehicle position can obscure, distort, or destroy the badges, labels, or markers responders might otherwise use.

5.3. Low-Light, Weather, and Smoke Conditions

Current propulsion-identification methods also fail under degraded visual conditions. Darkness, limited roadway lighting, rain, snow, fog, glare, smoke, steam, soot, and approach distance can make badges, labels, trim markings, and other manufacturer-specific cues difficult or impossible to read.

Initial size-up often occurs in exactly those conditions: dark roadways, storms, tunnels, parking structures, uneven lighting, smoke, steam, water, and apparatus glare.

FDNY responder-training material illustrates the point. In a bulletin addressing a fatal EV fire in an underground parking garage in Alcorcon, Spain, FDNY reported two firefighter deaths and 14 injuries after an EV crash, fire extension, and subsequent explosion while firefighters operated inside the garage. The bulletin warned that EV battery fires may produce explosive gases in limited-ventilation environments and noted that low visibility may prevent firefighters from observing what type of vehicle is involved.²³

5.4. Model Unfamiliarity

Current methods also rely too heavily on model familiarity, brand knowledge, and individual experience. Firefighters, EMS crews, law-enforcement officers, and towing personnel cannot be expected to recognize every electrified platform in a rapidly diversifying fleet.

²² Mercedes-Benz USA, 2026 G 580 with EQ Technology SUV, specifications identifying fuel type as electric, four permanently excited synchronous motors, and 116 kWh battery; Mercedes-Benz USA, The all-new 2025 Mercedes-Benz G 580 with EQ Technology; Ezra Dyer, *Mercedes-Benz Is Killing Its “EQ” Badge*, Car and Driver, Apr. 24, 2024.

²³ FDNY, *Tips from Training & Safety: EV Fire Kills Two Firefighters*, No. 34 of 2025 (Apr. 14, 2025).

5.5. Inability to Rely on Close Inspection During Initial Size-Up

Current methods often assume responders can safely move close enough to inspect badges, labels, trim marks, documentation, or secondary cues before making tactical decisions. In real emergency response, that assumption is unsound. Responders should not have to enter the hazard envelope simply to identify the hazard.

Close approach may be impractical or unsafe when a vehicle is smoking, burning, off-gassing, overturned, unstable, heavily damaged, pinned, in active traffic, or inside a garage, tunnel, or parking structure.

That concern is heightened because current lithium-ion guidance increasingly points toward a cautious, HAZMAT-informed posture where battery involvement is suspected, including air monitoring, respiratory protection through overhaul, control zones, possible evacuation, and an assumption that the hazard may persist even after visible fire is limited.²⁴

Close approach can itself increase exposure to off-gassing, thermal escalation, electrical hazards, or violent venting. Damaged lithium-ion systems can release toxic and flammable gases, retain high-voltage energy, and escalate with limited warning. A system that requires responders to move closer before they can identify the vehicle reverses the logic of safe size-up.

5.6. Limitations of VIN-Based or Document-Based Identification in the First Moments

VIN-based, document-based, and other secondary methods may help later, but they are not substitutes for first-moment, scene-visible propulsion recognition.

VIN and QR tools assume functioning devices, lighting, connectivity or software access, time, and scene stability.

These shortcomings reflect a design-side hazard-communication problem, not merely a training problem. Training cannot standardize exteriors, make subtle badging legible, or make damaged identifiers visible. The recognition gap is therefore appropriately addressed through a uniform federal standard for externally perceivable propulsion-type identification.

The issue also affects downstream responders. EMS personnel, tow operators, investigators, and storage-yard personnel may inherit the consequences of the first-arrival classification decision before guides or lookups are available. Federal towing and storage guidance and PHMSA warnings show that damaged high-voltage batteries may remain energized and present delayed fire, vent-gas, transportation, or storage hazards. Earlier scene-visible recognition reduces first-arrival uncertainty and downstream hazard transfer.²⁵

²⁴ U.S. Fire Administration & National Highway Traffic Safety Administration, *Electric Vehicle Fire/Rescue Response Operations* (2025).

²⁵ National Highway Traffic Safety Administration, *Interim Guidance for Electric and Hybrid-Electric Vehicles Equipped With High-Voltage Batteries (Towing and Recovery Operators and*

6. Propulsion-Specific Hazard and Response Differences

6.1. Internal Combustion Engine Vehicles

Conventional internal combustion vehicles present a familiar response profile, but they are not hazard-free. They can involve flammable liquid fuels, rapid fire spread, entrapment, pressurized components, roadway instability, and serious threats to responders and the public. The significance of ICE vehicles here is that they provide the conventional baseline against which propulsion-related differences become operationally important.

The question is not whether ICE vehicles are dangerous. It is whether other propulsion classes can present materially different responder-relevant hazards such that earlier identification has safety value.

6.2. Hybrid and Plug-In Hybrid Vehicles

Hybrid and plug-in hybrid vehicles can combine conventional fuel-system hazards with high-voltage battery hazards. NHTSA guidance directs responders to determine whether a vehicle is electric or hybrid-electric and warns that exposed electrical components and damaged high-voltage batteries may present shock, toxic or flammable gas, and immediate or delayed fire hazards. That mixed profile can affect suppression, extrication, cut-zone assumptions, isolation, overhaul, towing, and post-incident handling.²⁶

Not every hybrid incident will unfold the same way, but these vehicles can present a mixed hazard profile not communicated by ordinary exterior appearance.

6.3. Battery Electric Vehicles

Battery electric vehicles can present a hazard profile materially different from the ICE baseline. NTSB found that high-voltage lithium-ion battery fires pose electric-shock risk to responders and that damaged cells can undergo thermal runaway, reignition, or fire due to stranded energy.²⁷

NHTSA and USFA guidance reinforces those concerns by instructing responders to assume damaged high-voltage batteries remain energized and to consider that venting or off-gassing vapors may be toxic, flammable, and capable of producing immediate or delayed fire. Peer-reviewed studies also document hazardous fluoride-gas emissions during lithium-ion battery

Vehicle Storage Facilities), DOT HS 811 576 (Mar. 2014); Pipeline and Hazardous Materials Safety Administration, Safety Advisory Notice: Transportation of Electric Vehicles Containing Lithium Batteries Damaged by Extreme Weather Events (Apr. 7, 2023).

²⁶ National Highway Traffic Safety Administration, Interim Guidance for Electric and Hybrid-Electric Vehicles Equipped With High-Voltage Batteries (Law Enforcement / Emergency Medical Services / Fire Department), DOT HS 811 575 (Mar. 2014).

²⁷ National Transportation Safety Board, Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles, Safety Report NTSB/SR-20/01, at 57, 68–73 (2020).

fires.²⁸

Battery failure can produce toxic, corrosive, and combustible gases, including hydrogen fluoride, hydrogen chloride, carbon monoxide, carbon dioxide, methane, ethylene, propylene, and electrolyte-derived organic vapors. These emissions can accompany thermal runaway and may not be externally visible at first approach.²⁹

BEV incidents may also impose different monitoring and post-incident burdens because the hazard may persist after visible fire conditions appear controlled. NHTSA towing and storage guidance recommends continued inspection and separation of severely damaged vehicles, and PHMSA has warned that transportation of damaged EVs containing lithium batteries can present significant hazards.³⁰

EV battery-fire contamination studies and broader firefighter exposure literature indicate that contaminants can persist on gear and response surfaces after suppression, making overhaul, decontamination, towing, and secondary exposure control part of the responder burden.³¹

6.4. Why These Differences Matter to This Petition

This petition does not require NHTSA to find that one propulsion class is categorically more dangerous than another. The narrower point is that propulsion classes can present materially different responder-relevant hazard profiles, and those differences can affect first-arrival decision-making before close inspection or downstream documentation is available.

²⁸ National Highway Traffic Safety Administration, Interim Guidance for Electric and Hybrid-Electric Vehicles Equipped With High-Voltage Batteries (Law Enforcement / Emergency Medical Services / Fire Department), DOT HS 811 575 (Mar. 2014); U.S. Fire Administration & National Highway Traffic Safety Administration, Electric Vehicle Fire/Rescue Response Operations (2025); Fredrik Larsson, Petra Andersson, Per Blomqvist & Bengt-Erik Mellander, Toxic Fluoride Gas Emissions from Lithium-Ion Battery Fires, 7 Scientific Reports 10018 (2017).

²⁹ Thermo Fisher Scientific, Analysis of Smoke Composition and Toxicity from Lithium-ion Battery Failure Using Real-Time FTIR Spectroscopy, Application Note MCS-AN1260-EN (Jan. 2025).

³⁰ National Highway Traffic Safety Administration, Interim Guidance for Electric and Hybrid-Electric Vehicles Equipped with High-Voltage Batteries (Towing and Recovery Operators and Vehicle Storage Facilities), DOT HS 811 576 (Mar. 2014); Pipeline and Hazardous Materials Safety Administration, Safety Advisory Notice: Transportation of Electric Vehicles Containing Lithium Batteries Damaged by Extreme Weather Events (Apr. 7, 2023).

³¹ Yulin Wu et al., Understanding and Mitigating Contaminant Exposure in Firefighting: Comprehensive Review of Firefighter PPE on Contamination, Health Risks, and Decontamination Methods, 1 Occupational Health 12 (2026); Marcel Held et al., Thermal Runaway and Fire of Electric Vehicle Lithium-Ion Battery and Contamination of Infrastructure Facility, 165 Renewable and Sustainable Energy Reviews 112474 (2022).

7. Proposed Standard Framework

The proposed standard should be narrow, performance-based, and technology-neutral. It should require covered vehicles to communicate propulsion type through standardized, externally perceivable identification designed for emergency recognition, while allowing manufacturers flexibility in how they satisfy that safety outcome.

7.1. Covered Vehicles

The initial rule should apply prospectively to new covered motor vehicles manufactured for sale in the United States after an appropriate compliance date, addressing the recognition gap going forward without imposing an immediate retrofit obligation.

7.2. Defined Propulsion Classes

For the initial rulemaking, the standard should begin with a limited and administratively stable set of propulsion classes:

- internal combustion engine vehicles;
- hybrid, mild hybrid, and plug-in hybrid vehicles; and
- battery electric vehicles.

The agency may determine during rulemaking whether additional propulsion classes, including hydrogen fuel-cell vehicles or other emerging propulsion architectures, should be included in the first rule or addressed in a later phase.

7.3. Exterior Visibility and Recognition

The required propulsion-type identification should be perceivable from outside the vehicle and capable of conveying propulsion class from a specified responder approach distance, before responders enter the immediate hazard area or rely on close inspection.

It should also be recognizable under both daylight and low-light conditions. The agency may address this through contrast, reflectivity, passive illumination, photometric criteria, or other objective visual-performance measures.

The agency should consider whether passive visual markings are sufficient under darkness, smoke, precipitation, glare, and partial obstruction, or whether performance criteria should account for enhanced visibility or illumination.

7.4. Placement and Approach Angles

The standard should require standardized exterior locations or limited allowable placement zones that support recognition from common responder approach angles, so responders can locate and interpret the propulsion-class signal without searching across manufacturer-specific locations.

Placement should favor zones reasonably visible during initial size-up from front, rear, and quartering approaches, including under partial obstruction, non-ideal vehicle orientation, and degraded visibility.

NHTSA may consider whether lower-body locations are more likely to be obscured or rendered ineffective during response, and whether upper vehicle zones improve survivability and visibility under real-world conditions.

Illustrative Objective Criteria Framework

Examples of how the proposed standard could be stated in objective, testable terms.

1		Visibility Recognizable from a specified minimum distance set by the agency
2		Lighting Recognizable in daylight and low-light conditions under defined illumination criteria
3		Placement Restricted to standardized or limited allowable exterior zones
4		Durability Survives defined weathering, washing, and abrasion exposure
5		Post-crash usability Remains identifiable after defined minor crash-damage or surface-obscuration conditions
6		Meaning Fixed national mapping between identifier and propulsion class

Illustrative only — compliance conditions to be defined through rulemaking.

Figure 1. Illustrative Objective Criteria Framework.

7.5. Durability and Initial Survivability

The required identification should withstand ordinary weathering, washing, and service-life exposure and remain usable during initial post-crash or emergency response. It need not survive every catastrophic event, but it should not predictably fail when needed.

The agency may also consider recognizability after emergency-response conditions such as pressurized water, soot, surface contamination, and partial physical damage, including whether surface-applied-only methods are more susceptible to degradation or obscuration.

7.6. Uniform Meaning

The meaning of the required identification should be fixed nationally. It should not vary by manufacturer, trim line, brand language, model number, or styling convention. Standardization replaces a fragmented, brand-dependent system with one nationally intelligible signal.

7.7. Technology-Neutral Compliance

The standard should not depend on active connectivity, database access, QR scanning, telematics, or device-enabled interpretation. Those tools may remain useful supplements, but the core requirement should be immediately visible and understandable without secondary tools. The proposal does not prescribe a specific technology, format, or design; it defines a safety outcome and leaves compliance pathways to manufacturers.

7.8. Final Design To Be Developed Through Rulemaking

This petition does not ask NHTSA to select a final symbol, color, illumination method, physical format, or design configuration at the petition stage. Those details should be developed through notice-and-comment rulemaking, technical evaluation, manufacturer input, responder input, human-factors analysis, and practicability assessment.

The request is limited to the safety requirement: covered vehicles should communicate propulsion class externally through a standardized, performance-based method that is visible, recognizable, durable, consistently placed, and uniform in meaning.

7.9. Practicability and Objective Criteria

The proposed standard is practicable because manufacturers already design and install exterior markings, labels, lamps, and vehicle-identification features. The missing element is standardization and safety purpose, not manufacturing capability.

The standard can be stated objectively through measurable criteria for presence, meaning, placement, visibility, recognizability, lighting conditions, approach angles, durability, and continued usability after defined minor damage or surface obscuration.

FMVSS No. 141 provides a useful analog because it establishes externally perceptible performance requirements for hybrid and electric vehicles to address a safety-recognition problem affecting pedestrians. The same regulatory principle supports objective performance requirements where a vehicle characteristic creates a safety-relevant recognition problem.

7.10. Implementation Considerations

A reasonable phase-in period would be appropriate, such as no earlier than the second model year after publication of a final rule or another lead-time period developed through notice and comment.

The final rulemaking should consider validation or compliance concepts related to:

- visual recognition from a specified minimum distance;
- daylight and low-light recognition performance;
- recognition from front, rear, and quartering approach angles;
- compliance with standardized or limited allowable placement zones;
- durability under ordinary weathering, washing, and service-life exposure; and
- continued recognizability after defined minor damage or surface-obscuration conditions relevant to initial response.

Together, these elements would establish a practical, bounded, safety-focused first-generation standard that improves responder recognition without prescribing a proprietary design, imposing immediate retrofit, or resolving every downstream tactical issue associated with alternative propulsion.

8. Expected Safety Benefits and Cost Considerations

8.1 Safety Benefits

The expected safety benefit is earlier and more reliable hazard classification, not elimination of the underlying hazards. The proposed requirement would improve how quickly and accurately responders recognize propulsion-related hazards at scene.

Earlier classification supports safer standoff decisions, better approach angles, faster protective posture selection, and closer alignment of suppression, extrication, isolation, towing, and storage decisions to the actual hazard profile.

That causal chain is safety-relevant because federal and responder guidance already treats propulsion-specific information as operationally important. NTSB has identified electric-shock

risk, stranded energy, thermal runaway, and reignition as responder hazards in damaged EV battery incidents; NHTSA maintains emergency response guides and rescue sheets; and USFA emphasizes continued adaptation of EV response tactics. Together, those sources confirm that propulsion information can materially affect responder decision-making.³²

The proposal would also improve downstream hazard transfer. Once propulsion type is recognized correctly at the outset, that information can move more coherently to EMS, law enforcement, towing operators, investigators, storage personnel, and other downstream actors, improving later decisions about transport, storage, monitoring, contamination precautions, and public protection.

A nationally uniform exterior identification method would also improve consistency across jurisdictions by allowing responders to learn one system of meaning instead of relying on brand-specific cues, model familiarity, or delayed secondary tools.

The safety benefits are real even if they cannot be reduced at the petition stage to a single quantified injury-reduction figure. The benefit is improved speed, accuracy, and consistency of early hazard recognition at the point where responders must make consequential decisions under uncertainty.

8.2 Cost and Practicability Considerations

The requested rule should impose modest costs compared with typical vehicle design, manufacturing, and compliance requirements. It does not seek a complex, active, or network-dependent system; it seeks a standardized exterior means of communicating propulsion class through performance criteria such as visibility, recognizability, placement, and durability.

Manufacturers already design and install exterior markings, lighting elements, labels, and identification features. Propulsion-type identification would therefore be an incremental design and integration requirement rather than a novel manufacturing capability.

Per-vehicle cost is expected to be low relative to total vehicle cost, particularly when incorporated into new-vehicle design cycles. Prospective-only application would further reduce cost by avoiding immediate retrofit obligations.

The potential benefits are tied to earlier, more accurate hazard recognition at first approach, supporting better standoff, approach, protective posture, tactical alignment, and downstream handling decisions.

Although the precise benefits cannot yet be reduced to one quantified figure, the causal pathway is direct: propulsion type can materially affect responder-relevant hazards, and earlier recognition

³² National Transportation Safety Board, *Safety Risks to Emergency Responders from Lithium-Ion Battery Fires in Electric Vehicles*, Safety Report NTSB/SR-20/01 (Washington, DC: National Transportation Safety Board, 2020); National Highway Traffic Safety Administration, *Emergency Response Guides*, <https://www.nhtsa.gov/emergency-response-guides>; U.S. Fire Administration and National Highway Traffic Safety Administration, *Electric Vehicle Fire/Rescue Response Operations* (2025).

improves decision quality under time pressure.

The requested rule also fits established performance-based regulatory practice. NHTSA can define the safety outcome while leaving manufacturers multiple compliance pathways, producing a uniform safety result with modest implementation burden.

9. Conclusion

The problem is straightforward: the national vehicle fleet is becoming less self-explanatory while propulsion-related hazard profiles are becoming more diverse and, in some cases, more operationally significant for responders and downstream personnel.

Conventional internal combustion, hybrid and plug-in hybrid, and battery electric vehicles do not always present the same responder-relevant hazard picture or permit the same tactical assumptions. Earlier recognition of propulsion type therefore has clear safety value.

Current identification methods are inadequate for first approach. Badging is inconsistent and manufacturer-dependent; model familiarity, VIN lookup, rescue sheets, and other secondary tools may help later, but they are too indirect, delayed, or condition-dependent to solve the threshold recognition problem.

For these reasons, the Petitioner requests that NHTSA commence rulemaking on a narrow, objective, performance-based standard requiring covered motor vehicles to communicate propulsion class through standardized, externally perceivable identification. Such a rule would improve immediate hazard recognition and support safer responder decision-making in the modern vehicle environment.

Appendices

Appendix A – Supporting Declaration of Battalion Fire Chief Steven LaPenta

I, **Steven LaPenta**, declare as follows:

I submit this declaration strictly in my individual capacity. Although I serve as a Battalion Fire Chief with the Newark Department of Public Safety, Fire Division, I am not submitting this declaration on behalf of the Fire Division, the Newark Department of Public Safety, the City of Newark, any command staff, New Jersey UASI, or any affiliated public agency. Nothing in this declaration should be interpreted as an official position, policy recommendation, endorsement, authorization, or representation of my department, employer, municipality, or any governmental entity. The opinions, observations, and conclusions expressed in this declaration are my own and are based on my personal knowledge, training, experience, and professional judgment.

1. My fire-service responsibilities include hazardous-materials response, training, special operations, New Jersey UASI Fire CBRNE leadership, and service as a New Jersey State Certified Fire Instructor Level 2. My work centers on responder safety, public protection, incident support, training, and management of high-risk emergencies.
2. I make this declaration based on my personal knowledge, training, experience, and professional judgment developed through more than three decades in the fire service, including service as a firefighter, company officer, battalion chief, hazardous-materials responder, instructor, and command-level leader.
3. In emergency response, the first few moments matter. Personnel make life-safety decisions about tactical positioning, approach, suppression, extrication, isolation, and downstream handling before complete information is available, often in darkness, smoke, weather, traffic, crash debris, noise, confusion, and time pressure.
4. Based on my field experience, propulsion type is not always obvious when responders arrive. Existing badging and manufacturer-specific markings are not a reliable emergency-recognition system because they may be small, subtle, inconsistent, brand-dependent, or lost to damage, fire, lighting, soot, or vehicle position.
5. Responders should not have to commit to close inspection before they know what they are approaching. Initial size-up should provide enough information to make safer decisions before personnel move deeper into the hazard area.
6. Different propulsion systems can materially change the hazard picture. Conventional, hybrid, plug-in hybrid, battery electric, and other alternative-fuel vehicles do not always permit the same assumptions for approach, suppression, extrication, overhaul, towing, storage, and post-incident handling.
7. In my judgment as a command-level fire officer, unnecessary uncertainty raises risk. If responders do not know what they are dealing with early enough, that can affect apparatus positioning, protective posture, approach, suppression, extrication, and information passed to EMS, towing, investigators, and others downstream.

8. My hazardous-materials, CBRNE, technical-rescue, vehicle-extrication, incident-safety, and emerging-vehicle-hazard experience has reinforced my professional judgment that the current vehicle-identification environment is not aligned with emergency-response realities.
9. Standardized, scene-visible propulsion-type identification would not solve every problem or replace training, rescue sheets, or other resources. It would reduce avoidable uncertainty when responders most need clarity and better support responder, occupant, and public safety.
10. I support this petition because the issue is real, practical, and growing. As propulsion systems evolve, hazard communication should keep up through a nationally uniform, scene-visible way to identify propulsion type.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Executed on: 19 June 17, 2026



Steven LaPenta

Appendix B – Summary of Existing Standards / Guidance

This appendix summarizes the guidance environment relevant to emergency response involving conventional, hybrid, plug-in hybrid, battery-electric, and other alternative-fuel vehicles. Existing resources recognize that propulsion type matters, but they generally operate through model-specific documents, portals, training materials, and secondary reference tools rather than a uniform, scene-visible vehicle signal.

Fire-service guidance follows that structure. NFPA materials instruct responders to identify the drive system and use badges, labels, components, instruments, and orange cables as cues. NHTSA interim guidance likewise tells responders to determine whether a vehicle is electric or hybrid, keep distance, avoid high-voltage cabling and warning-label areas, and account for delayed fire and storage separation after severe battery damage. These resources are useful, but they assume responders can identify propulsion type soon enough to apply them.

Federal regulation also addresses electric-powertrain hazards without standardizing on-vehicle propulsion identification. FMVSS Nos. 305 and 305a address electric powertrain integrity and related shock, fire, explosion, and gas-venting concerns. NHTSA's 2024 FMVSS No. 305a NNHTSA's emergency-response information framework likewise treats propulsion and powertrain information as responder-relevant. NHTSA maintains manufacturer-submitted emergency response guides and rescue sheets for electric-powered passenger cars, multipurpose passenger vehicles, trucks, and buses, and NHTSA's final FMVSS No. 305a rule established 49 CFR Part 561 requirements for standardized emergency response guides and rescue sheets. That framework confirms the safety relevance of propulsion information while leaving the first-approach exterior recognition gap unresolved.

Recent safety findings show that the guidance ecosystem remains incomplete. USFA notes that credible EV-response guidance remains limited and that significant science gaps remain. NTSB likewise identified inadequacies in manufacturer emergency response guides and practical challenges in determining whether dangerous energy remains in damaged batteries. These findings support the premise that current information pathways are imperfect and fragmented.

International and industry standards confirm that rescue guidance, post-identification procedures, and propulsion identification are related but distinct problems. ISO 17840-1 and 17840-3 address rescue sheets and emergency response guide templates, while ISO 17840-4 specifically addresses propulsion-energy identification. SAE J2990 addresses hybrid and EV responder practices, and SAE J3108/1_202412 addresses standardized coding for alternative-fuel vehicles.

This petition does not seek to replace emergency response guides, rescue sheets, telematics, portals, NFPA materials, or consensus standards. Those resources show that propulsion information matters. The remaining gap is earlier and narrower: the moment before responders can access or apply those secondary tools, when they must decide how to approach, isolate, assess, extricate, suppress, tow, or otherwise manage the vehicle.

Appendix C – Figures / Illustrations

The figures in this appendix are offered for a limited evidentiary purpose. They are included to show either: (1) why current propulsion-related markings fail as a responder-oriented hazard-recognition system, or (2) what characteristics a compliant future identification method should satisfy. They are not offered as a general catalog of vehicle branding, incident imagery, or design concepts. Properly understood, the figures show that the current environment is inconsistent, brand-dependent, frequently subtle, and poorly suited to first-moment emergency recognition, while also illustrating why any future standard should prioritize visibility, predictable placement, recognizability, and survivability under real response conditions.



Figure 2.
Propulsion-related Markings

Current propulsion-related markings are inconsistent, ambiguous, and not designed as a uniform

emergency-recognition system.

The sub-figures below illustrate the fragmented and non-standardized nature of the current marking environment. Some vehicles use explicit fuel-language, some rely on subtle or brand-specific badging, some place safety-relevant information inside the vehicle, and some provide no clear propulsion information at ordinary approach distance. Taken together, these examples demonstrate that the current vehicle environment does not provide a nationally uniform, responder-oriented means of identifying propulsion class at first approach.

Figure 2, Item 1. Explicit CNG exterior marking.

This image shows that exterior propulsion marking is feasible. Its weakness is not clarity, but nonuniformity and fragility: the marking appears discretionary, surface-applied, and not part of a nationally standardized responder-recognition system. This supports the proposition that isolated examples of explicit marking do not solve the broader hazard-communication gap.

Figure 2, Item 2. Brand-styled electric badging.

This image shows a Porsche “electric” badge applied in a subtle, brand-styled format on the vehicle body. Although the marking communicates propulsion information to a knowledgeable viewer, it is not standardized, not responder-oriented, and may be difficult to recognize quickly at approach distance, especially because its styling blends into the vehicle’s exterior design.

Figure 2, Item 3. Manufacturer-specific electrified model designation.

This image shows Mercedes-Benz “GLE 450e” badging, where the small “e” is the primary exterior cue that the vehicle has an electrified propulsion configuration. The marking depends on familiarity with manufacturer-specific model nomenclature and may appear to responders as ordinary trim or model language rather than safety-relevant propulsion information.

Figure 2, Item 4. Interior high-voltage warning label.

This image shows safety-relevant propulsion information located inside the vehicle structure. Such a label may be useful after close approach or during detailed inspection, but it does not solve the first-approach recognition problem because responders may need to classify the vehicle from outside the hazard envelope before moving close enough to see it.

Figure 2, Item 5. Small exterior plug-in badging.

This image shows small exterior “plug-in” badging placed low and off-center on the vehicle body. The marking may communicate useful information under ideal conditions, but it is placement-dependent and may be missed at distance or obscured by darkness, weather, smoke, glare, soot, crash damage, or vehicle orientation.

Figure 2, Item 6. Brand-specific EV model badging.

This image shows BMW “i5” badging, where the electric-vehicle meaning depends largely on

brand and model familiarity, with only a subtle blue design element reinforcing the propulsion cue. To a responder unfamiliar with the model, the marking may read as ordinary model designation rather than immediate propulsion-class information.

Figure 2, Item 7. Brand-specific propulsion branding.

This image shows Jeep “4xe” branding, which communicates electrification through manufacturer-specific terminology rather than a uniform responder-recognition signal. The badge may be meaningful to consumers or brand-familiar responders, but it is not self-explanatory across the national fleet and does not provide a standardized propulsion-class cue.

Figure 2, Item 8. Ambiguous rear model badging.

This image shows Land Rover rear badging with a small “P400e” designation. The propulsion significance of the marking is not immediately apparent without familiarity with the manufacturer’s naming system, illustrating how current exterior cues often rely on brand-specific decoding rather than clear hazard communication.

Figure 2, Item 9. Styled electrification cue obscured by branding.

This image shows Jeep Wrangler side badging where the electrification cue appears through blue styling and brand-specific “Wrangler” treatment rather than a clear standardized propulsion identifier. The result is a marking that may be visible but not reliably interpretable as propulsion information during first-moment emergency recognition.

The following figures address a related point: even where propulsion cues exist before an incident, distance, darkness, smoke, confined infrastructure, suppression activity, damage, and post-fire degradation can render them unreadable or meaningless. A future standard should therefore prioritize visibility, predictable placement, recognizability, and usability under degraded conditions.

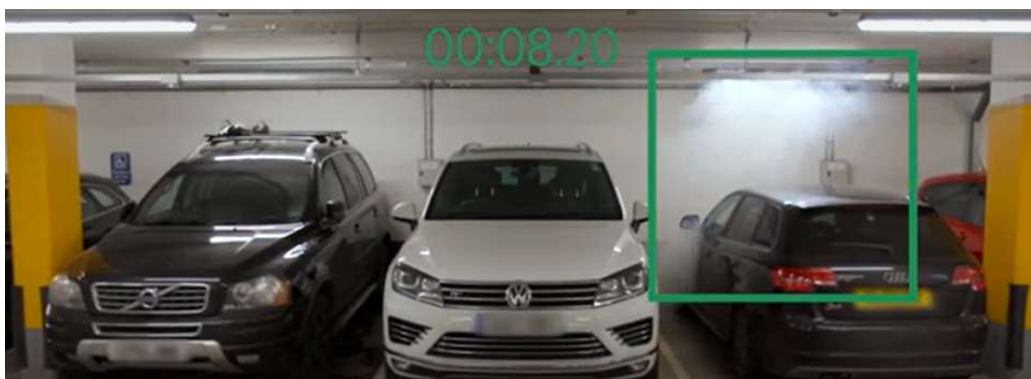


Figure 3.

Propulsion type is not readily discernible even under ordinary surveillance observation.

This image shows a vehicle in a parking structure as smoke begins to emerge. Even at this early stage, propulsion class is not readily apparent from exterior appearance alone, showing that the recognition problem arises before full fireground degradation.



Figure 4.

Standoff conditions and propulsion uncertainty can materially affect initial tactics.

This still image shows responders operating from standoff during a smoke-producing vehicle fire. After water was applied, conditions changed rapidly and battery cells or battery-related components appeared to eject from beneath the vehicle. The figure illustrates why responders may need propulsion recognition from approach distance before close inspection is realistic and before scene actions materially change conditions.

Source: Still image derived from publicly available incident video, YouTube Shorts, <https://youtube.com/shorts/NPs4U3PDvgQ?feature=share> (last accessed May 7, 2026).



Figure 5.

Parking-structure conditions defeat subtle visual cues.

This image shows active vehicle-fire response in a parking structure with smoke, adjacent exposures, and constrained sightlines. Subtle consumer-facing cues are inadequate in that setting, supporting the need for visible and predictable identification in enclosed, high-consequence environments.



Figure 6.

Low-light enclosed-space response exposes the mismatch between current badging and emergency use.

This image shows a dark parking-structure response with smoke, glare, and limited visibility, where any propulsion-related badging may be invisible or uninterpretable when responders need it.



Figure 7.

Tunnel incidents amplify the consequences of delayed recognition.

This image shows a vehicle fire inside a tunnel, where approach options are limited and visibility is degraded. Such environments make subtle branding or close inspection especially deficient as an identification method.



Figure 8.

Active fire and suppression rapidly overwhelm existing cues.

This image shows a vehicle under active suppression with smoke, flame, soot, water application, and scene clutter. By this stage, small badges, decals, and model-specific cues have little practical value.

  **Tips from Training & Safety**  

EV Fire Kills Two Firefighters



Alcorcon, Spain – 4/2/2025

Recently in Alcorcon, Spain (near Madrid) two firefighters were killed while operating at a fire in an underground parking garage. Reports indicate that the driver of an electric vehicle (EV) crashed inside the garage, and the vehicle ignited. Fire extended to several nearby vehicles. Firefighters entered the garage to extinguish the fire when suddenly a strong explosion occurred. 14 other firefighters were also injured. The cause of this explosion is under investigation – this tip has been developed to provide learning points about the explosive potential of EV's.

- EV's are powered by many lithium-ion batteries. When they burn, they produce several types of hazardous gases. **Two of the most abundant gases produced are Hydrogen and Carbon Monoxide** - both are explosive, especially in areas with limited ventilation such as an underground garage- see [tip #31/2025](#) which further discusses lithium-ion gases.
- **The importance of properly wearing all PPE cannot be overstated** – especially wearing a donned facepiece that is secured with the helmet's chinstrap. **If an explosion occurs the helmet and facepiece may become dislodged if not secured.** At this incident it was reported that one firefighter died from smoke inhalation. See [tip #31/2023](#).
- **Use the reach of the hose stream at all parking garage fires and EV fires.** Low visibility may prevent firefighters from observing what type of vehicle is involved. Consider the many hazards during parking garage fires – see [tip #28/2025](#).
- In February FDNY units operated at an EV fire after a collision- see [tip #17/2025](#).
- **A SIM was recently produced to simulate an [EV fire in an underground garage](#).**

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Disclaimer: Tips are created by the FDNY. Follow Your Departments Guidelines

Figure 9.

FDNY “Tips from Training & Safety” bulletin

This FDNY bulletin discusses a fatal EV fire in an underground parking garage in Alcorcon, Spain, where two firefighters were killed and 14 injured following a crash, fire extension, and subsequent explosion. It highlights flammable-gas, explosion, and reduced-visibility concerns relevant to initial propulsion recognition.

The material illustrates confined spaces, smoke-obscured visibility, and rapid hazard escalation where current identification methods may not provide timely propulsion recognition.



Figure 10.

G-Wagon ICE VS BEV

This figure compares the Mercedes-Benz G 550 and the Mercedes-Benz G 580 with EQ Technology. The G 580 is battery electric, yet its exterior remains closely aligned with the broader G-Class family. The point is not to criticize styling, but to show that consumer-facing model language and subtle exterior differences do not perform the same emergency-recognition function as standardized, scene-visible propulsion identification.

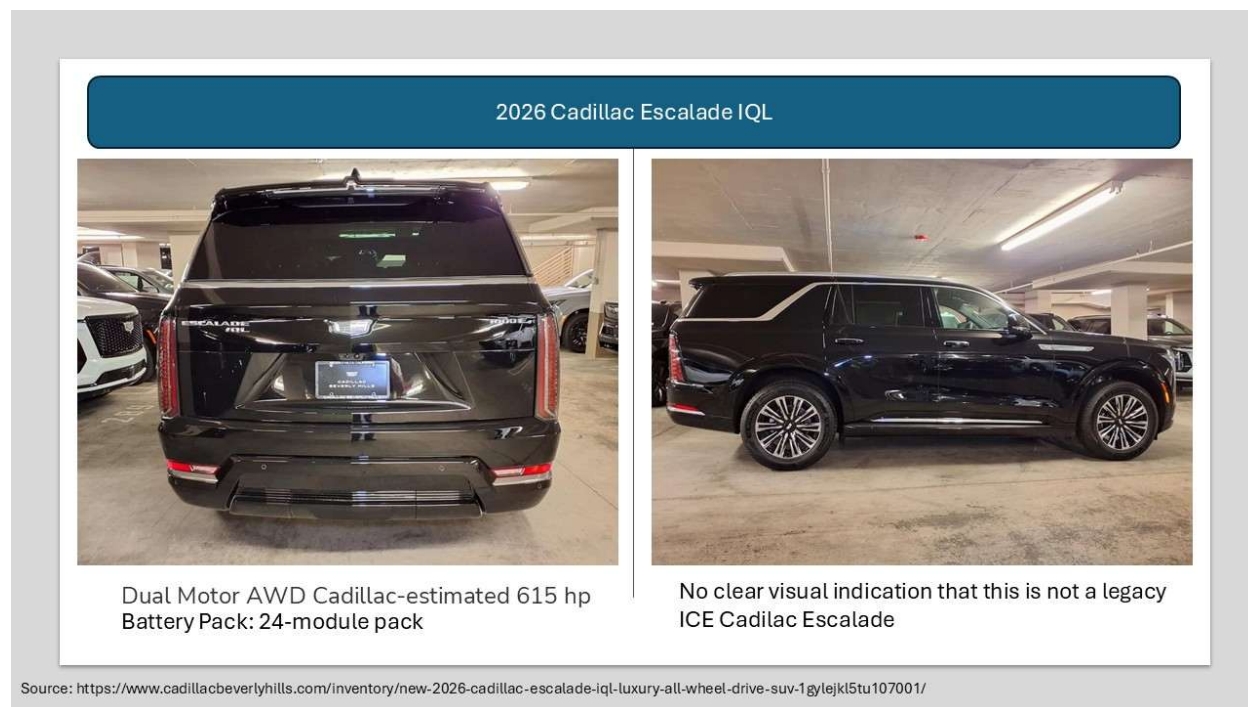


Figure 11.

Cadillac Escalade BEV

Figure 11 shows a 2026 Cadillac Escalade IQL, a fully battery-electric version of one of the most recognizable American sport-utility vehicles. The Escalade nameplate has a long history and strong visual familiarity in the United States, particularly among large luxury SUVs commonly encountered on public roads. To an arriving responder conducting an initial scene size-up, however, this vehicle presents substantially like a conventional Cadillac Escalade. Despite being a battery-electric vehicle with a materially different propulsion system and associated emergency-response considerations, the exterior views shown do not provide an immediately discernible, standardized, scene-visible indication of that propulsion-type difference. The example illustrates the core problem addressed by this petition: responders may be approaching a vehicle with materially different hazards while the vehicle’s outward appearance remains largely consistent

with a familiar legacy **internal-combustion vehicle**.

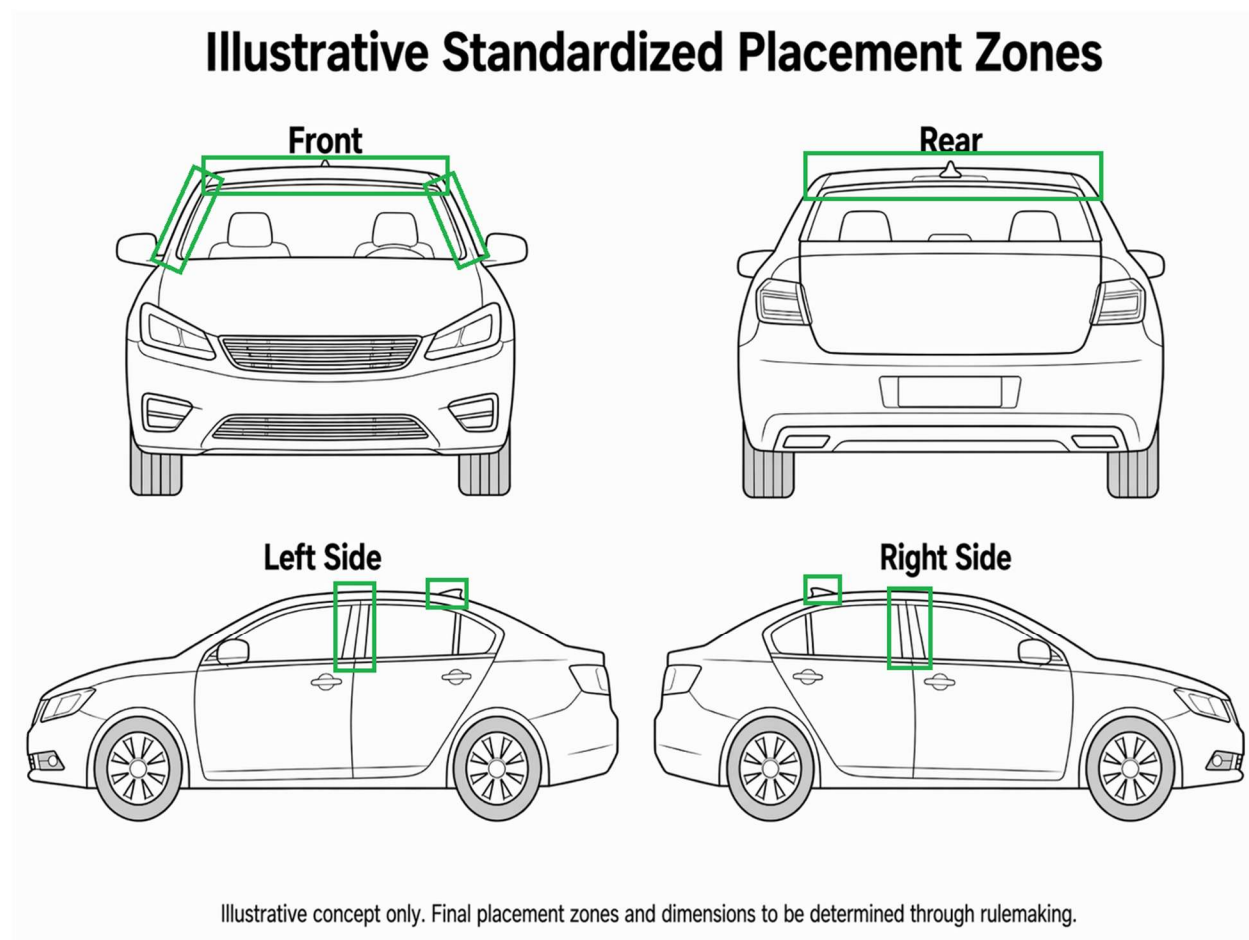


Figure 12.

Illustrative Standardized Placement zones

This figure illustrates a placement concept, not a mandated final design. It shows the logic of locating propulsion identification where it is more likely to remain visible during crash, fire, and post-crash response rather than in lower areas more likely to be obscured.

Illustrative Propulsion-Type Hazard Matrix

High-level responder-relevant hazard considerations by propulsion class (illustrative only).

Hazard / Consideration	Internal Combustion Engine (ICE)	Hybrid / Plug-in Hybrid	Battery Electric Vehicle (BEV)
 1. Liquid-fuel fire	 Primary hazard	 Fuel + battery	 No liquid fuel
 2. High-voltage shock	 Not typical	 Possible	 Possible
 3. Stranded electrical energy	 Not typical	 Possible	 Possible
 4. Thermal runaway	 Not typical	 Possible	 Primary concern
 5. Toxic off-gassing	 Possible in fire	 Possible	 Heightened concern
 6. Delayed reignition	 Less characteristic	 Possible	 Heightened concern
 7. Post-incident towing / storage precautions	 Routine precautions	 Elevated precautions	 Heightened precautions



Illustrative only. This matrix is a high-level comparison and does not replace incident-specific judgment, manufacturer guidance, or responder training.

Figure 13.

Propulsion Type Hazard Matrix

This figure provides a high-level comparison of responder-relevant considerations across internal combustion, hybrid and plug-in hybrid, and battery electric vehicles. It supports the proposition that outwardly similar vehicles may present materially different hazard profiles.

Together, these figures show that current propulsion-related markings are inconsistent, ambiguous, placement-dependent, and often unusable as responder-oriented hazard communication. They also show why any future compliant method should be visible, predictable, recognizable, and sufficiently durable for first-moment emergency use.

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