



U.S. CONSUMER PRODUCT SAFETY COMMISSION
5 RESEARCH PLACE
ROCKVILLE, MARYLAND 20850

Hope E. J. Nesteruk
Human Factors Engineer
Division of Human Factors
hnesteruk@cpsc.gov

May 1, 2015

Mr. Thomas S. Yager
Vice President, Safety Programs
Specialty Vehicle Institute of America
2 Jenner Street- Suite 150
Irvine, California 92618-3806

Dear Mr. Yager:

I¹ am writing to update the Specialty Vehicle Institute of America (SVIA) on CPSC activities related to all-terrain vehicles (ATVs). Although I am sure you follow staff's activities and reports on ATVs, I wanted to bring your attention to several aspects and ask that the standards development committee for ANSI/SVIA-1-2010 consider these points when it next revisits the standard for the 5-year periodic review.

1. Vehicle detection

CPSC's ATV Special Study, cited earlier, found that at least 28 percent of injuries and 45 percent of fatalities involve a collision (Table 2, Table 14). Of the collision-related fatalities, 34 percent involved a second vehicle. As illustrated in Figure 1, on-road vehicles (primarily cars and trucks) were most likely the secondary vehicles involved. Figure 2 illustrates the same data by the other type of vehicle involved in the fatality. These data further support the recommendation that has received near-universal support by CPSC, SVIA, ATV-advocacy groups, and safety-advocacy groups: ATVs should not be driven on paved, public roads with on-road vehicular traffic. However, the data also indicate that driving ATVs on public roads, with on-road vehicular traffic, is a foreseeable misuse. Although ATV users are warned against on-road use, the incident data indicate that warnings alone have not been effective in changing consumer behavior and are not preventing all on-road use. As such, staff urges the standards committee to consider ways to increase ATV conspicuity and improve ATV detection by other vehicle drivers. Any improvements in vehicle conspicuity are also likely to reduce vehicular collisions in off-road environments.

¹ The views in this letter are those of the staff and have not been reviewed or approved by, and may not reflect the views of, the Commission.

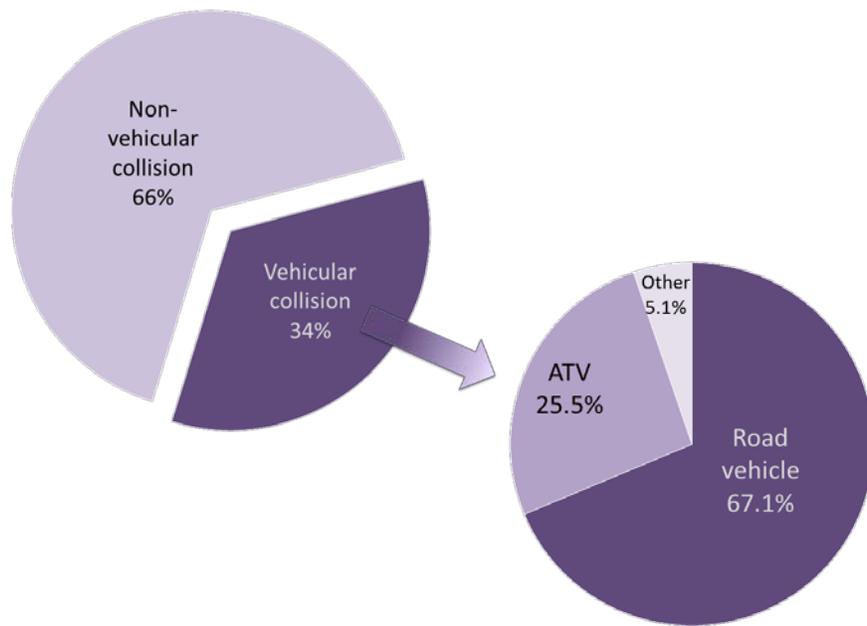


Figure 1. ATV-related collision-related fatalities in the ATV Special Study (cited earlier), by type of collision

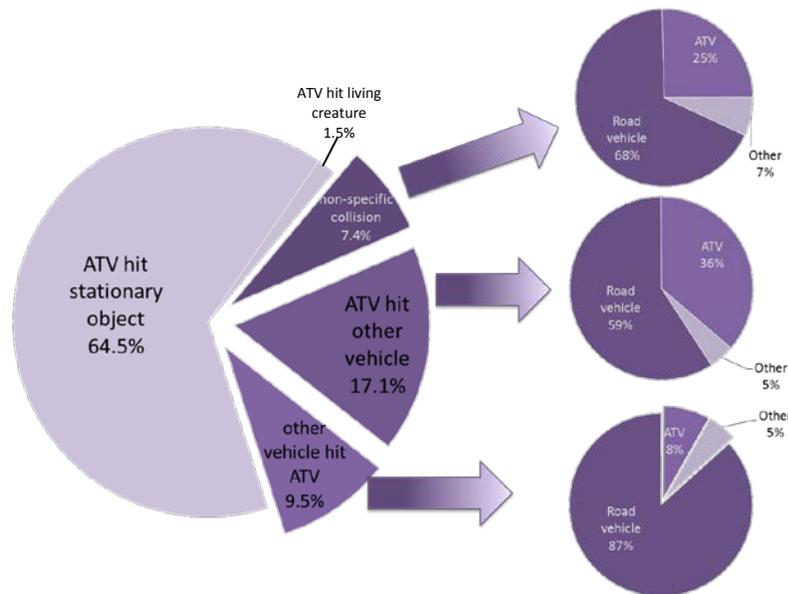


Figure 2. ATV-related collision fatalities in the ATV Special Study (cited earlier)

The Consumer Product Safety Improvement Act of 2008 (CPSIA) required that CPSC staff consult with the National Highway Traffic Safety Administration (NHTSA) about ATV rulemaking. In discussions with NHTSA, CPSC staff learned about NHTSA’s low-speed vehicle standard, FMVSS 500, which was promulgated “to ensure that low-speed vehicles operated on the public streets, roads, and highways are equipped with *the minimum motor vehicle equipment*

appropriate for motor vehicle safety (emphasis added).”² The following 10 items are covered in FMVSS 500 as the minimum safety equipment:

1. Headlamps
2. Front and rear turn signal lamps
3. Tail lamps
4. Stop lamps
5. Reflex reflectors
6. Mirrors
7. Parking brake
8. Windshield
9. VIN
10. Seat belts

Staff recognizes that some of these 10 safety requirements, specifically seat belts and windshields, generally are inappropriate for most current ATVs. Additionally, several items are already addressed in ANSI/SVIA-1-2010: head lamps, tail lamps, and parking brakes. Staff encourages the standards committee to consider requirements for the remaining items: stop lamps, reflex reflectors, mirrors, and turn signals. In addition to the safety requirements in FMVSS 500, staff also encourages the standards committee to consider adding audible horns as an ATV safety requirement.

Stop lamps

One method that may increase the detectability of ATVs is the use of stop lamps. CPSC staff proposed mandatory stop lamps in its 2006 NPR, but the standards committee still has not adopted this known method for increasing the detection of the driver intention. Mandatory stop lamps are likely to increase the safety of ATVs and serve as a visual signal of brake performance. As outlined below, the data show: that many manufacturers are already installing a version of a stop lamp; that consumers expect stop lamps; and that rear-end collisions while an ATV is slowing are a typical fatal hazard pattern.

Despite the standard’s lack of mandatory requirements for stop lamps, the industry appears to be embracing the use of some types of stop lamps. Recently, staff purchased 12 different models of ATVs for a test program. All 12 vehicles incorporated a visual braking signal into the tail lamp; however, implementation was not consistent across vehicles. That is, in some vehicles the stop lamp illuminated regardless of whether the hand brake or foot brake was actuated, which clearly signals any following vehicles of the drivers intentions to slow. However, in other vehicles, the stop lamp illuminated only when one of the brake controls was actuated (*e.g.*, for the hand brake, but not the foot brake). The latter situation results in a vehicle whose stopping behavior is not easily predictable by other drivers, and actually may mislead other drivers into believing that the vehicle is not stopping when the brakes are, in fact, being applied. For example, if the driver of such an ATV applies the brake using a control that does not activate the stop lamp, a driver who is following that ATV will not receive a signal of the leading driver’s intention. Without a visual braking signal, the trailing driver will only be able to react to the slowing, by detecting perceived speed differentials. In addition, the lack of a consistent braking signal can actively mislead the

² 49 C.F.R. 571.500, S2

trailing driver into believing that the leading vehicle is not slowing because of exposures to other braking situations when the stop lamp on the leading ATV did illuminate.

In addition, data from CPSC's ATV Special Study, cited earlier, show that 97 percent of consumers who reported that their vehicle had a tail lamp, also claimed that the vehicle had a stop lamp. This suggests two possible explanations:

1. *Virtually all ATVs already incorporate a stop lamp into the design.* If virtually all ATVs already incorporate a stop lamp, staff questions why the standards committee resists requiring a stop lamp.
2. *Virtually all consumers expect the tail lamp to function as a stop lamp, without understanding that the two are not necessarily linked.* This may result from consumers transferring knowledge from other on-road motorized vehicles, which are required to have stop lamps, onto off-road motorized vehicles, and assuming that ATVs are like other motorized vehicles with respect to stop lamp behavior. Simply put, consumers see the tail lamp on the vehicle and assume that it also functions as a stop lamp, because other tail lamps in their experience also function as stop lamps.

Finally, a preliminary review of one year (2007) of ATV-related fatality data involving two ATVs colliding identified 13 rear-end collisions.³ Of those 13 incidents, eight involved a leading ATV slowing or stopping and a following ATV colliding with the leading vehicle. Although this is only a preliminary analysis, the data indicate that rear-end collisions related to braking is an identifiable hazard pattern. A broader review of the data that mirrors the time period of the recent special study (2005–2007), and that includes all ATV-related collisions, including collisions with other motorized vehicles, would likely identify more incidents.

For the reasons stated above, CPSC staff asks the standards committee to make the following changes in the standard (~~strikethrough~~ indicates text to be removed, underline indicates added text):

4.17.1 Headlamps, Tail Lamps and Stop Lamps. All ATVs except Category Y shall have, and Category Y may have, at least one headlamp projecting a white light to the front of the ATV and at least one tail lamp projecting a red light to the rear. All ATVs ~~may be optionally~~ shall be equipped with a stop lamp or combination tail-stop lamp, and such lamp(s) shall be illuminated by the actuation of ~~any~~ each and every service brake control.

4.17.2 Specifications. Headlamps, except Category Y, shall conform to Recommended Practice, SAE J1623 FEB94; and tail lamps shall conform to Standard, SAE J585 MAR00. Category Y ATVs if equipped with a headlamp shall meet the minimum illumination requirements listed in SAE J1623 FEB94, Table 2. ~~If the ATV is equipped with a stop lamp, such~~ Stop lamp(s) shall conform to Standard, SAE J586 MAR00 or Recommended Practice, SAE J278 MAY95.

³ 2012 All-Terrain Vehicle Deaths (ATVD 2012) database, U.S. Consumer Product Safety Commission, Directorate for Epidemiology/Division of Hazard Analysis and Directorate for Engineering Sciences/Division of Human Factors.

Reflex reflectors

CPSC staff's preliminary review of 331 fatal vehicular collision ATV-related incidents found that more than 30 percent of these incidents occurred at night and an additional 5 percent occurred in low-light (*i.e.*, dusk). Although many factors contribute to incidents, increasing the visibility and conspicuity of ATVs at night will certainly raise the likelihood that the driver of an oncoming vehicle will detect the ATV. Early detection of an ATV may allow the driver of an oncoming vehicle sufficient time to react and avoid a collision. As such, staff encourages the standards committee to consider adding requirements for reflectors to increase the conspicuity of an ATV at night.

NHTSA's FMVSS 500 requires the following reflex reflectors: "one red on each side as far to the rear as practicable, and one red on the rear." In addition, FMVSS 108 states that reflectors shall be mounted "on the rear, at the same height, symmetrically about the vertical centerline, as far apart as practicable." Because fatalities occur when ATVs cross public roads between fields or trails, staff believes that the requirements for side reflectors are crucial to any new efforts to increase vehicle conspicuity.

Staff suggests the following addition to the ANSI/SVIA-1-2010 standard to address reflectors:

4.25 Reflex Reflectors. All ATVs shall be equipped with at least one red reflector on each side of the vehicle, mounted as far to the rear and as high as practicable; one amber reflector on each side, mounted as far forward and as high as practicable; at least one red reflector on the rear of the vehicle, mounted as high as practicable; and at least one amber reflector on the front of the vehicle, mounted as high as practicable. If multiple reflectors are mounted on the front or rear of the vehicle, each reflector shall be mounted as far apart as practicable, mounted symmetrically about the vehicle centerline, and at the same height. All reflectors shall meet the performance standards in either Table I or Table IA of SAE Standard J594f, Reflex Reflectors.

Mirrors & Turn signals

FMVSS 500 also includes mirrors and turn signals. CPSC technical staff considered the applicability of mirrors and turn signals for ATVs, but technical staff has reached no conclusion at this time. Staff asks the voluntary standards committee discuss these two forms of safety equipment.

Horn

In addition to the items in FMVSS 500, CPSC staff also suggests that the voluntary standards committee consider requiring an audible horn that meets the requirements of SAE J377 and that is operable by the driver without removing their hands from the handlebars. The addition of a horn allows ATV drivers to warn others of impending danger and to signal around blind corners. In addition, the committee could consider adding a feature that activates the horn automatically if the ATV has rolled over or collided, to allow first responders to locate the vehicle more quickly.

2. User Populations

In recent years, consumer groups and others have expressed concern about inappropriate users riding ATVs, including multiple riders on single-person ATVs and children riding inappropriate vehicles. Minor changes could be made to ATVs to reduce the likelihood of these use patterns and associated hazards. Although the following focuses on reducing the likelihood of children being able to start and subsequently drive inappropriate vehicles, CPSC staff recommends that the voluntary standards committee evaluate methods for addressing both hazard patterns. CPSC staff is still analyzing the responses to the recent request for information regarding passenger use of ATVs and has no recommendations at this time.

Children

An ignition interlock that requires a hand action (*e.g.*, key twist) and a foot action (*e.g.*, brake pedal or clutch pedal) could build in an anthropometric limit for starting the vehicle. This simple change could work to reduce the likelihood of a young child starting an inappropriate vehicle. Some manufacturers appear to have already implemented a pedal interlock because staff has found that some vehicles require a foot brake to be activated before the ignition switch will start the engine. Staff encourages the standards committee to consider methods to prevent a child from starting an adult ATV. For example, a requirement of foot pedal actuation could be added into section 4.11 of the standard. Because section 4.11 already has two options, brake and clutch, which often are implemented as a foot pedal, staff does not anticipate this being a costly change; and a foot pedal clutch or foot pedal brake requirement may reduce the likelihood of a child being able to start an adult ATV.

Currently, staff is evaluating a prototype child-resistant ignition switch for usability by both children and adults. We also encourage the industry to evaluate options, such as the suggestion above, that could reduce the likelihood of children being able to start inappropriate ATVs. We will share the results of our analysis as soon as the results are available.

3. Vehicle stability

CPSC staff and the SVIA have discussed ATV stability for many years, and staff continues to believe that increasing vehicle stability will reduce deaths and injuries. The Commission⁴ and its staff have continued to encourage the ATV industry to incorporate lateral stability requirements in the voluntary standard. Lack of lateral stability requirements for ATVs was acknowledged in CPSC's 2006 notice of proposed rulemaking (NPR) and the associated briefing package. Two examples from the 2006 NPR and associated briefing package are given below:

At this point in time, the industry has not been able to develop a satisfactory test of lateral stability (movement from side to side). Thus, the ANSI/SVIA-1-2001 standard has a requirement for pitch stability, but not for lateral stability. The Commission's proposed standard likewise contains requirements only for pitch stability. However, the Commission encourages the industry to continue to pursue an accurate and reliable test for lateral stability.⁵

⁴ 56 Fed. Reg. 47,166, 47,171 (Sept. 18, 1991) and 71 FR 45904, 45908 (August 10, 2006)

⁵ 71 FR 45904, 45908 (August 10, 2006)

A major effort by both the Commission and the industry was made during the development of the voluntary standard, and the publication of the first voluntary standard was a testament to that cooperative achievement. Nevertheless, while great efforts were made to address the very complicated issue of vehicle stability, time constraints mandated by the Consent Decrees necessitated compromises on those requirements.⁶

Meanwhile, deaths and injuries related to vehicle overturning continue to occur. CPSC's most recent special study on ATV deaths and injuries⁷ reaffirmed that about 60 percent of ATV-related incidents involve the vehicle overturning, regardless of other hazard patterns involved, such as collisions, turning, or external terrain features.

A more stable vehicle could reduce deaths and injuries in several ways. For example, a more stable vehicle will give users both the time and the ability to recover from initiating events that could lead to overturning or loss of control. As such, increased stability could change some future incidents into non-incidents. Because ATV design generally precludes occupant restraints, roll-bars, or many of the other occupant protection means that are available on recreational off-highway vehicles (ROVs), preventing vehicle overturning is the best way to avoid injuries that are caused by crushing or entrapping the user.

In recent years, CPSC staff has made great progress in quantifying the handling and rollover resistance characteristics of ROVs. We recently began a new ATV test and evaluation program that leverages the knowledge gained from ROV testing. Although there are numerous differences between these two types of off-road vehicles, CPSC staff is confident that the strides made in ROV testing will contribute to similar strides in the dynamic testing of ATVs. Ideally, the standards development committee will also leverage the test and evaluation gains made by the Recreational Off-Highway Vehicle Association (ROHVA) as they apply to ATVs, and will consider those gains in the next revision of the voluntary standard for ATVs.

Summary

In this letter, CPSC staff:

- asks the standards committee to consider specific changes in the requirements for stop lamps, and reflectors;
- asks the standards committee to consider additional safety equipment, such as a horn, mirrors, turn signals, and an anthropometric starter interlock; and
- describes the agency's current work on ATV safety, including work on vehicle stability.

Thank you for your consideration of these important safety issues.

Sincerely,



Hope E.J. Nesteruk

⁶ Paul, C. (2006, May 23). *Draft Proposed Requirements for All-Terrain Vehicles*. CPSC Memorandum to Elizabeth Leland, Project Manager. Washington, DC: Consumer Product Safety Commission

⁷ <http://www.cpsc.gov/Global/Research-and-Statistics/Injury-Statistics/Sports-and-Recreation/ATVs/ATVSpecialStudyReport.pdf>