

included in the label. One of these three said the statement was “*ridiculous*” and another said, “*I think that first sentence is somewhat insulting. I think parents whose kids have been riding for years would look at it and laugh.*” The one participant in this focus group who preferred that the statement be left on said “*I think it’s something to think about...I do think it’s a little bit insulting, but...it’s something to think about.*”

5.4.5.3 Additional Issues Raised by Participants

In the first focus group, participants volunteered their preference for SVIA category names that were more descriptive in nature. Some participants indicated a potential for confusion with the names of the SVIA categories saying, for instance, that the Y-6 sounded like it was for children “up to age 6.”

Participants in the second focus group and in the follow-up interviews were then asked their opinions about category names for both systems. These participants did not collectively have an overall preference for the names used in one system or the other, but stated that they would prefer names to be more descriptive or ability-oriented.

Participants in the first and second focus groups provided suggestions for alternative category names but no consensus was reached.

The suggestion by members of the second focus group that category names be more ability- rather than age-oriented, is consistent with the general perception by members of the focus groups that too much emphasis was being placed on age as a criteria for ATV operation, both with respect to the labeling and with respect to the age-cut-offs between categories. Many participants emphasized the importance of goodness of fit, and mentioned that they believed the ATV chosen for a child should be based on the child’s skill or experience level and/or the parent’s assessment of their child’s abilities to operate an ATV. Many participants also emphasized the importance of training and supervision as considerations in decisions related to Youth ATV operation.

5.5. Study #2 - Youth Interviews

5.5.1. Method

5.5.1.1. Participants

Nineteen (19) youth participated in individual interviews, all of which were conducted in person. The four female and 15 male participants had an average age of 14.6 years, ranging from 11 to 18 years. The distribution of participants’ ages is shown in Figure 5.29.

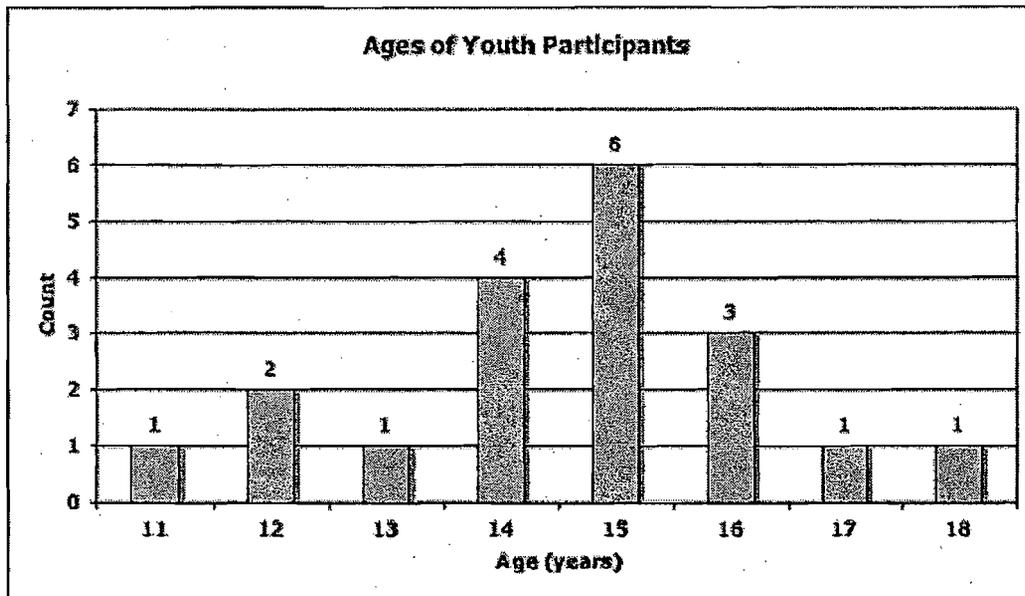


Figure 5.29. Distribution of Youth Participants' Ages

A screening process was used to identify participants age 10 to 18 who had operated an ATV or would be likely to operate an ATV if given the opportunity. Regarding ATV operating experience, 63% of the participants had operated an ATV more than 20 times, 16% had operated an ATV 10-20 times, 11% had operated an ATV less than 10 times, and 11% had never operated an ATV but would be likely do so if given the opportunity.

Although participants were recruited from the Southeast Michigan area, they had experience operating ATVs in many different areas, including Florida, Ohio, Colorado, and New York.

Participants were asked when they last operated an ATV. Of the 17 participants asked this question, 12 reported operation in the last week, four in the last month, and one in the last year.

Participants were also asked to recall the size of the ATV they last operated. Of the 17 participants asked this question, 14 reported that the last ATV they had operated had an engine size greater than 90 cc, 1 reported an engine size of 90 cc, and 2 did not know the engine size. The distribution of ATVs last operated, by engine size, is shown in Figure 5.30.

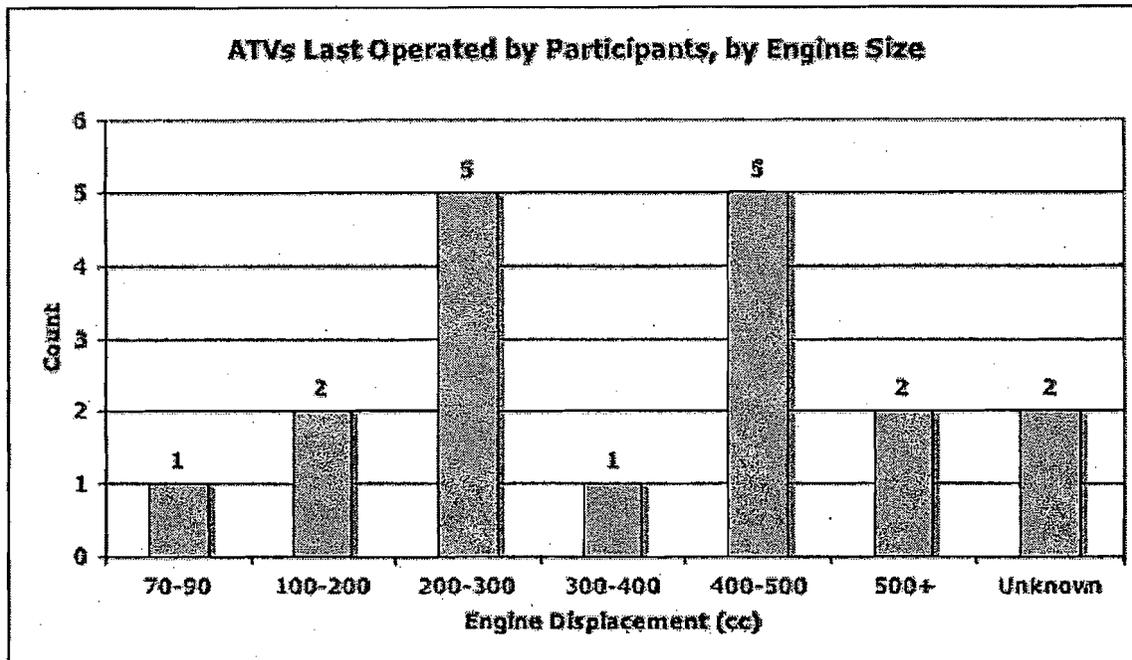


Figure 5.30. Distribution of Sizes of ATVs Last Operated by Participants

Finally, participants were asked whether their family owned any ATVs. Of the 18 participants asked this question, 11 reported that their families did own one or more ATVs and seven reported that their family did not own any ATVs.

5.5.1.2. Procedure

The interviews followed a questionnaire comprised of questions about Youth ATV categories and questions about the participant's background. A sample questionnaire is shown in Appendix C.

To begin, participants were asked a series of qualifying questions. Qualifying participants were then shown a picture of an ATV and given a brief orientation to ATVs.

Next, participants were shown charts of ATV categories and asked a series of questions about the categories. Some of the participants (Condition 1) were shown the charts in Appendix B and some (Condition 2) were shown the charts with the order and titles of Set A and Set B reversed.

Finally, participants were asked a series of background questions, thanked for their participation, and paid \$10. The interviews lasted about 15 minutes.

5.5.2. Results

5.5.2.1. Preferred Categories

Participants were first asked to select, of all the options on the chart, which category ATV they would most want to have; this category was recorded as their "first choice." Then participants were asked to select, from only the options in the opposite set, which category ATV they would most want to have; this category was recorded as their "second choice." Those participants who selected the Adult model as their first choice were not

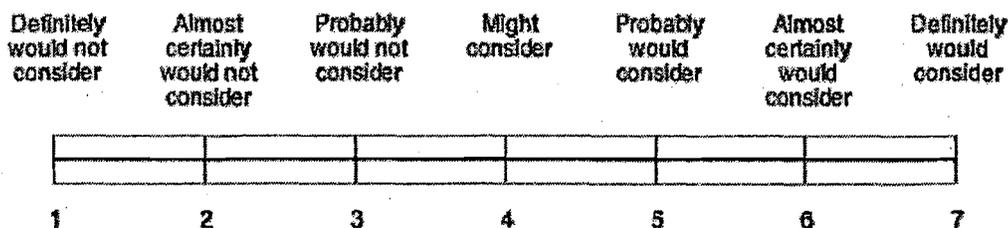
asked to select a second choice. Participants over age 15 were asked to remember back to when they were 14 in answering these questions.

Of the 19 participants, 14 (74%) chose the Adult model as their first choice, and were not asked for a second choice. Of the five remaining participants, three chose the Transitional model as their first choice. Two of these three chose the Adult model as their second choice when forced to select a category under the NPR-proposed set of categories. The selections of all 19 participants are summarized in the following table:

First choice	Second choice	Count
Adult	--	14
Transitional	Adult	2
Transitional	Teen	1
Teen	Transitional	1
Y-10	Pre-Teen	1

5.5.2.2. Consideration of Other Categories

Participants were then asked, if they had only the options in a given set, how strongly they would consider picking an ATV from the age-appropriate category and from the categories above the age-appropriate category or older. For example, if a 14 year old chose an Adult model as his first choice, he was then asked (1) if he had only the options in Set A, how strongly he would consider picking a Teen model and (2) if he had only the options in Set B, how strongly he would consider picking a Transitional model. If a 12 year old chose the Teen model as his first choice, he was then asked 1) if he had only the options in Set B, how strongly he would consider picking the Y-10 and Transitional models, and how strongly he would consider picking an Adult model. Again, for these questions, participants over age 15 were asked to remember back to when they were 14. Participants responded using the following scale:



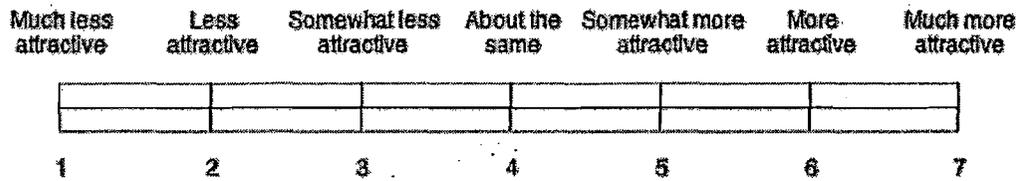
Of the 14 participants who chose the Adult model as their first choice, 13 were asked how strongly they would consider picking the Teen and Transitional models.² The average rating for the Teen model (2.8) was associated with “Probably would not consider” and was significantly lower than the rating (3.9; “Might consider”) for the Transitional model, $F(1, 12) = 17.8, p < .01$. Each of the 13 participants rated the

² One participant was not asked these questions due a procedural oversight.

Transitional model the same (four participants) or higher (nine participants) than the Teen model.

5.5.2.3. ATV Speeds

Next, participants were asked a series of questions about ATV speeds. Participants ages 12 and older ($n = 18$) were asked, on a 7-point scale, how much more or less attractive the Teen model would be if it had a maximum speed of 15 or 22 mph instead of 30 mph or could be adjusted to have a maximum speed of 38 or 45 mph in addition to the current 30 mph. Each of the four speeds (15, 22, 38, and 45) was rated separately and the order of the four speed questions for all participants was 38 mph, 22 mph, 45 mph, and then 15 mph. Again, for these questions, participants over age 15 were asked to remember back to when they were 14. Participants younger than 12 were asked similar questions pertaining to the Preteen ATV. Participants responded using the following scale:



The average ratings of each speed for these participants is shown in Figure 5.31. Ratings of attractiveness for the top speeds of 38 mph and 45 mph were significantly greater than for 15 mph and 22 mph, $F(3, 51) = 97.9, p < .001$. The speeds 15 and 22 mph did not differ from one another statistically ($p > .05$), nor did the speeds 38 and 45 mph ($p > .05$). Both the 38 and 45 mph speeds were significantly preferred to the 15 and 22 mph speeds ($p < .001$).

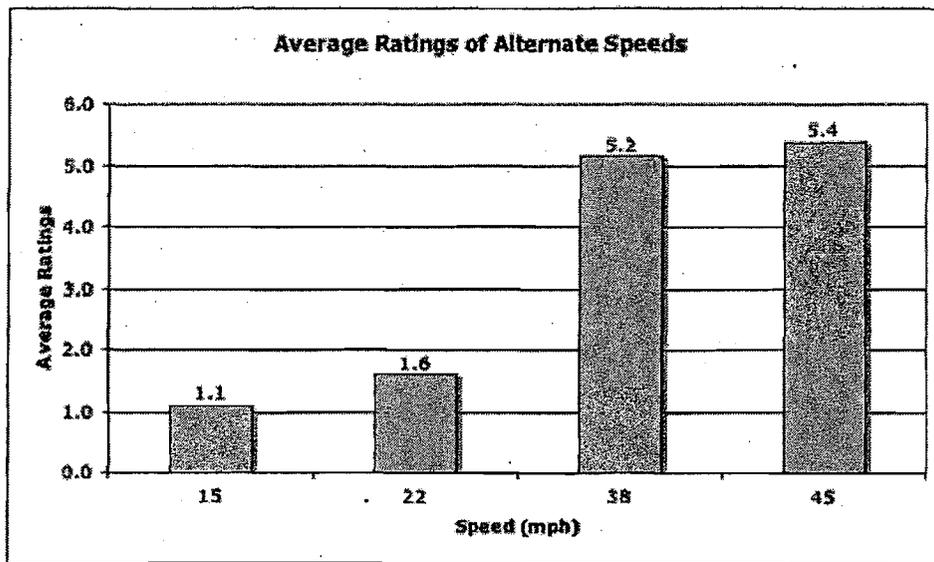


Figure 5.31. Average Attractiveness Ratings for Speeds Compared to 30 mph

The one remaining participant, age 11, responded with the following ratings for alternate top speeds of the Pre-Teen ATV as compared to the currently-specified top speed of 15 mph:

Speed	Rating
22	4
30	7
38	7

5.6. General Discussion of ASE Research

Several general conclusions can be drawn from the data collected in response to the CPSC NPR. These conclusions will be discussed in separate sections addressing the Age Recommendation Warning Label, the categorization systems, and ATV speeds.

5.6.1. Regarding Age Recommendation Warning Label

These data re-affirm that the Age Recommendation Warning Label specified in the 1988 Consent Decrees (currently in use, and proposed for use in ANSI/SVIA-1-200X) is well understood. Specifically, 100% of the participants understood that, according to the label, they should not let a child under age 16 operate an ATV that has the label on it. Thus, there is no indication that the alternative framing of the message in the proposed NPR label would have any effect on understanding the concept that adults should not let a child under 16 operate an ATV with this label on it. Moreover, there is evidence from focus groups with parents that this alternative framing may have negative effects on people's perception of and response to the label.

Aside from the issue of people understanding the age recommendation, the additional text and modified language suggested by the CPSC for the age label did not have a significant effect on any of the other measures including:

- level of comfort associated with allowing their child to operate the ATV;
- level of comfort associated with allowing some children age 12, 13, 14, or 15 to operate the ATV;
- level of comfort associated with purchasing an ATV for their child;
- likelihood of considering the label in deciding whether or not to allow their child to ride the ATV;
- likelihood of considering the label in deciding to purchase the ATV for use by their child;
- the perceived maturity of their child relative to other children their age or to an average 16 year old; or
- the perception of the percentage of children age 12, 13, 14, or 15 who would have mature enough judgment to operate the ATV.

In contrast, the results of this study showed a significant influence of the age of the child on a number of these measures. Collectively, these results indicate, as one might expect, that adults evidenced monotonically increasing expectations of similarity to 16 year olds

as children approach this age. There are also indications that, at around age 14, parents tend to become more comfortable with the notion of allowing a mature teen to operate an Adult ATV with a recommended minimum operator age of 16.

5.6.2. Relative Merits of NPR and SVIA Categorization Systems

When considering the purchase of an ATV exclusively for use by a child under age 16, parents in this study preferred the SVIA system to the NPR system. In terms of one major criterion, reducing the probability of parents purchasing Adult ATVs for children under age 16, the SVIA system was clearly superior. There was not a single instance where a parent selected an NPR Youth model and then selected an Adult model as their second choice when limited to the options in the SVIA system, while there are several instances of the converse.

When participants considered purchases for use by their family that included a child age 12-15 as well as older children and adults, their initial preference was almost three times more likely to be from the SVIA system than the NPR system. In this purchase scenario, the Adult category was more preferred than all three of the other NPR options combined.

When asked about their general (or overall) preferences for the two systems, participants preferred the SVIA system when purchasing an ATV for households with a child age 12 to 15 and for their own (i.e. the participant's) households in general. The NPR category system was not preferred by a majority of parents for any of these general-preference questions.

In the interviews with youths, it was clear that their preference, initially, was to operate an Adult ATV. Despite this fact, these youth participants were significantly more willing to consider selecting the SVIA Transitional model than the NPR Teen model. These participants' ratings of attractiveness of ATV speeds lend support to the notion that the SVIA Transitional model would be more attractive to them than the NPR Teen model.

Collectively, these results indicate that the SVIA categorization system is superior to the proposed NPR categorization system with respect to the NPR's goal of increasing the likelihood of children under 16 operating age-appropriate vehicles and reducing the likelihood of their operating adult-size ATVs.

5.6.3. ATV Speeds

For 12- to 15-year-old operators, the NPR system proposes a maximum speed of 30 mph. Parents were asked about the relative attractiveness of alternative top speeds. The results show, in general, that maximum speeds lower than 30 mph (i.e., 15 and 22 mph) made a prospective ATV significantly less attractive, and that maximum speeds higher than 30 mph (i.e., 38 and 45 mph) made a prospective ATV significantly more attractive.

These parents did not appear to desire unlimited speed for children age 12 to 15. For example, they rated 38 mph as more attractive than 45 mph, even though 45 mph was preferred over 15 and 22 mph. Other data suggest that parents were looking for a maximum speed that would satisfy children as well as other family members. Data from interview participants and focus groups indicated that parents simply wanted an ATV that would be fast enough so children would not be bored, children could keep up with other family riders, other adult operators of the ATV would be satisfied, etc. Adults in this

study reported that the speeds offered under the SVIA system were superior to the NPR system in these respects, as well as in terms of their adjustability.

6. Comments Regarding Labeling Provisions of the NPR

6.1. Introduction

This section compares the provisions of the CPSC's NPR (CPSC, 2006) to the current ANSI/SVIA-1-200X draft consensus standard (ANSI/SVIA-1-200X, Draft as of September 7, 2006), addresses comments of CPSC staff regarding labels currently used, and provides recommendations to resolve differences between the NPR and the ANSI/SVIA-1-200X draft consensus standard. General topics pertaining to all or several labels are addressed first, followed by topics specific to each label. Copies of the labels specified by the ANSI/SVIA-1-200X draft standard are provided in Appendix A.

6.2. General comments

6.2.1. Use of ANSI/SVIA labels within any CPSC Regulation

It is our understanding that the CPSC did not include labels directly from the ANSI/SVIA draft consensus standard in the NPR, in part, due to concerns regarding copyright restrictions, but that these restrictions have been resolved. Assuming permission for use of the ANSI/SVIA labels can be confirmed, it is our recommendation that the CPSC use these labels in any ATV regulation.

6.3. Comments regarding the General Warning Label

6.3.1. Type I ATVs

The General Warning Label proposed in the NPR is essentially identical³ to the label specified in the 1988 Consent Decrees (see Final Consent Decree, 1988, Appendix A; CPSC, 2006, proposed §1410.10(a)(2) and §1515.10(a)(2)). More recently, the CPSC worked in concert with ATV manufacturers to develop a general label that the CPSC found to be "as effective as" the original consent decree label (Rubel letter, October 11, 1996; Miller Engineering, Inc., 1996). The revised label has been used since approximately 1998 and has been used by ATV manufacturers that entered the market in the mid- to late- 1990s and by those who partnered with the CPSC to develop and follow action plans similar to the provisions of the consent decree. A recent CPSC staff review of the General Warning Label found in ANSI/SVIA-1-200X concluded that it was "essentially identical" to the label developed with approval from the CPSC by manufacturers who were parties to the Consent Decrees,⁴ and found its content and format "adequate for use in a mandatory ATV standard" (Smith memo, May 23, 2006, p. 4).

³ In the NPR, the word "certified" is omitted from the statement, "Beginners should complete a certified training course," found in the second bullet of the Consent-Decree label (Consent Decree 1988, Appendix A; CPSC, 2006, proposed §1410.10(a)(2) and §1515.10(a)(2)).

⁴ In the label reviewed by CPSC staff, three of the four pictograms are slightly different and the statement "READ THE OWNER'S MANUAL" instead states, "LOCATE AND READ OPERATOR'S GUIDE" (Smith memo, May 23, 2006, p. 3; ANSI/SVIA-1-200X, Draft as of September 7, 2006, Figure 5).

Since the CPSC staff favorably reviewed the ANSI/SVIA-1-200X General Warning Label, and since it is our understanding that copyright restrictions have been resolved, it is our recommendation that any CPSC regulation should include the General Warning Label specified by ANSI/SVIA-1-200X for Type I ATVs.

6.3.2. Type II ATVs

As with the Type I label, it is our understanding that, due to copyright restrictions, the General Warning Label specified by ANSI/SVIA-1-200X was not published as a requirement in the CPSC's NPR,⁵ but that permission has now been granted to use the SVIA labels within any CPSC regulation.

The Type II General Warning Label specified by ANSI/SVIA-1-200X was developed based on a CPSC review of labels in 2002 and an additional process of evaluations and revisions directed and facilitated by ASE (2003). This process included several forms of evaluation, including structured interviews, focus groups and peer reviews.

CPSC staff, in evaluating a label similar to the Type II General Warning Label proposed by ANSI/SVIA-1-200X, expressed concerns about the phrase "dismount passenger when conditions require." First, CPSC staff stated that "when conditions require" is "vague and open to interpretation" and that "[u]nless consumers are aware of the conditions that "require" the removal of the passenger, this statement is unlikely to be very effective" (Smith memo, May 23, 2006, p. 4). Second, the CPSC staff also expressed concern that the information was largely redundant to information on the Type II Passenger Warning Label. Based on these observations, the CPSC staff concluded, "this information should be removed from the general warning label." Third, the CPSC staff expressed concern that "the label is directed to the driver yet 'dismount' is an action the passenger, not the driver, should take." The staff suggested that rewording the phrase to "passenger should dismount..." or "passenger should get off..." would be more appropriate.

Regarding CPSC staff statements that the words, "when conditions require" are "vague and open to interpretation" and "unlikely to be very effective," we note that focus group and structured interview testing performed by ASE in 2003 found the statement to be clear and that it was a valuable supplement to the message "reduce speed and use extra caution at all times when carrying a passenger." Participants in the 2003 data collection offered a number of examples of situations in which dismounting a passenger should be considered, including obstacles, steep hills, a muddy ditch or bank or any condition in which the operator doesn't "feel comfortable" having the passenger on the ATV. Thus, empirical research does not support these concerns raised by CPSC staff.

In response to CPSC staff statements regarding redundancy, it is important to note distinctions between the instructions provided in the General label versus the Passenger Safety label. In particular, the General label instruction to the operator to use extra caution with a passenger on board and to dismount the passenger when conditions require

⁵ The NPR requires that the Type II General Warning Label meet requirements for the Type I General Warning Label, omitting the statement, "NEVER CARRY A PASSENGER. You increase your risk of losing control if you carry a passenger" (CPSC, 2006, proposed §1410.19(a)(1)). Thus, unlike ANSI/SVIA-1-200X, the NPR does not require that the Type II General Warning Label contain any information specific to Type II ATVs.

complements the Passenger Safety label instruction to the passenger to tell the operator to slow down or stop if uncomfortable and to get off if conditions require. We also note that the General label and Passenger label are typically in distinct locations as specified in the ANSI/SVIA standard. In contrast, note that the CPSC staff comments regarding redundancy were based, in part, on the assumption that the General label and Passenger label would both be located on the fender (Smith memo, May 23, 2006, p. 8).

Finally, regarding the style of the text (e.g. “dismount passenger” rather than “have your passenger get off”) we first generally observe that the use of “headline-style” is consistent with recommended preferred word message formatting found in ANSI Z535.4, Annex B (ANSI, 2002). The basic concern of CPSC staff appears to be that the use of a headline-style in this case may result in misunderstanding and lack of sufficient clarity. We disagree. The phrase “dismount passenger” is clearly an instruction to the operator to have the passenger dismount when conditions require. In addition, the present wording also serves as a proposition to both operators and passengers that some conditions may require the passenger to get off the vehicle.

It is our recommendation that any CPSC regulation should include the General Warning Label specified by ANSI/SVIA-1-200X for Type II ATVs, with the understanding that the ANSI/SVIA-1-200X draft will be changed to delete reference to specific “2-up” ATV training.⁶

6.4. Comments regarding the Age Recommendation Warning Label

6.4.1. Type I ATVs – Youth

The NPR specifies that Youth Age Recommendation Warning Labels contain the following, or “substantially equivalent” statements, for example: “Operation of this ATV by children under the age of 6 increases the risk of severe injury or death. Adult supervision required for children under age 16. NEVER let children under age 6 operate this ATV.”

The ANSI/SVIA-1-200X Age Recommendation Warning Labels for Youth ATVs are nearly identical to the Consent Decree Youth Age Recommendation Warning Labels (ANSI/SVIA-1-200X, Figure 6; Consent Decree, 1988, Appendix B). CPSC staff reviewed an example of these labels and did not recommend changes to them (Smith memo, May 23, 2006, p. 5). The only difference between these labels and those in the NPR is the use of the word “permit” rather than “let” in the last sentence of the labels. The substitution of the word “let” appears to be related to CPSC staff recommendation to use the word “letting” in the hazard statement for the Age Recommendation Warning Label for Adult ATVs. Use of the word “letting” in Age Recommendation Warning Labels for Youth ATVs was neither recommended nor proposed, thus this reason for changing the word “permit” to “let” (i.e., to use the same root word in both sentences) is

⁶ At the time the “2-up” ATV General Warning Label was developed, SVIA ATV training was not available for purchasers of “2-up” ATVs, thus instruction to obtain specific “2-up” training was included. It is our understanding that SVIA ATV training is now available to purchasers of both Type I and Type II ATVs.

no longer valid. It is our opinion that words “permit” and “let” are “substantially equivalent,” however, the word “permit” should be used in any CPSC regulation to maintain consistency between the regulation, the 1988 Consent Decrees, and the ANSI/SVIA standard.

6.4.2. Type I ATVs – Adult

The CPSC’s proposed rule requires that Age Recommendation Warning Labels for Adult ATVs contain the following, or “substantially equivalent,” statements: “Even youth with ATV experience have immature judgment and should never drive an adult ATV. Letting children under the age of 16 operate this ATV increases their risk of severe injury or death. NEVER let children under age 16 operate this ATV.” These NPR provisions were apparently based on a CPSC staff review of current labeling practices, which concluded that the current labels were “vague about the nature of the hazard” and “failed to describe the reasons for the increased risk” involved with children riding Adult ATVs (Smith memo, May 23, 2006, p. 5). Furthermore, the CPSC staff review suggested that the ANSI Z535.4 consensus standard required “by default” additional information regarding the nature of the hazard. The CPSC staff review states that the primary reasons for age recommendations “appear to be children’s lack of experience and, more importantly, their immature judgment” (Smith memo, May 23, 2006, p. 5). While the review concedes that “[m]ost parents probably understand that younger children are generally less mature and may have less experience than other riders,” it also claims that without an explanation for age recommendations “parents could ascribe any number of behaviors or characteristics to the recommendations” and “more easily rationalize why their children are exceptions to these recommendations” (Smith memo, May 23, 2006, p. 5).

Regarding the issue of explanatory text accompanying warnings about operator/user age, some general comments are noteworthy. First, it is widely recognized that there is no specific age, set of characteristics, or formula to definitively determine one’s readiness to use all sorts of products or participate in any number of activities (see Sections 2 and 3 of this report). For innumerable activities and products, parents and caregivers routinely make assessments about whether or how children should engage in an activity. Age recommendations and/or requirements are but one potential, and not sufficient, factor that is or may be considered. Therefore, in general, one should expect that parents and caregivers routinely make judgments based on multiple factors and that there is not an expectation that a specific rationale can or must be succinctly stated for an age proscription.

Second, it is not normative to provide the type of explanatory text suggested by the CPSC. For example, the CPSC has participated in developing ANSI standards for many other motorized products that include safety messages that simply proscribe operation by “children.” These products include walk-behind mowers, ride-on mowers, walk-behind snow-throwers, ride-on snow-throwers, powered shredder/grinders and shredder/baggers, and walk-behind rotary tillers. Based on our review of these standards from several years ago, we observed that the proscriptions to not allow children to operate the products are not accompanied by additional explanatory text. In our investigation of other products (discussed in Section 3), the vast majority of manufacturers of motorized wheeled products did not provide additional information regarding their age recommendations.

Thus, there is no reason to believe that consumers have generally formed an expectation that additional explanatory text will be provided for age-related warnings about motorized products. Furthermore, in the case of ATV age labeling, the proposed SVIA labeling already includes more explanatory text (in the form of a message about relative risk of injury or death) than what is typically provided with age-related proscriptions.

Third, age recommendations are often based on collective judgments, social norms, and enforcement considerations rather than an inherent safety requirement based on the characteristics of a product. Indeed, several focus group participants clearly perceived excessive emphasis on age recommendations (see results discussed in Section 5.4). We also note that the CPSC's suggested text ascribes only one characteristic (i.e., immature judgment) to the age recommendation and thus may lead parents who conclude that their child has relatively mature judgment to disregard the recommendation even if, for example, their child's psychomotor skills are well below average. In contrast, the current approach allows parents to accept that the recommendation may be related to "any number of" factors (see Table 3.2 for a list of nine factors related to individual differences) or to consult the owner's manual or other materials for additional information and explanation.

In sum, the SVIA label already provides explanatory text beyond what is typically provided, and our focus group research found evidence that the additional text in the proposed NPR label may have negative effects on people's perception of and response to the label. In addition, the existing SVIA text has been previously tested and found to be well-understood. In our study, 100% of the participants understood that, according to the label, they should not let a child under age 16 operate an ATV that has the label on it. In contrast, we are not aware of any testing supporting the NPR's additional text or revisions "to direct the warning to adults" (Smith memo, May 23, 2006, p. 6), and we do not otherwise see a net benefit associated with the additional proposed text. As such, we recommend that the "immature judgment" text be excluded from the regulation, and that any CPSC regulation include the Age Recommendation Warning Label specified by ANSI/SVIA-1-200X.

6.4.3. Type II ATVs

The CPSC's proposed rule specifies the same requirements for Age Recommendation Warning Labels for Type II Adult ATVs as Type I Adult ATVs (CPSC, 2006, proposed §1410.19). The CPSC's proposed rule is consistent with the CPSC staff finding that the text "NEVER carry more than one passenger," was redundant with the General Warning Label, and the staff recommendation that this statement be removed from the Age Recommendation Warning Label for Type II Adult ATVs (Smith memo, May 23, 2006, p. 6). In proposing the same requirements for Age Recommendation Warning Labels for Type II Adult ATVs as Type I Adult ATVs, the NPR has essentially followed this recommendation.

In contrast, the ANSI/SVIA-1-200X requires an Age Recommendation Warning Label for Type II Adult ATVs that is different from that required for Type I ATVs. In particular, the ANSI/SVIA label refers to increased chances of severe injury or death "to both rider and passenger" and adds the statement, "NEVER carry more than one passenger" (ANSI/SIVA-1-200X, Figure 14).

The precise reason for including the instruction, “NEVER carry more than one passenger” within this label is unknown, but it may be related to reference to passengers in the hazard statement (i.e., increased chances of severe injury or death to both operator and passenger). Given that this label is to be located near the General label⁷ and that this message is also found in the Passenger label, we agree that the instruction, “NEVER carry more than one passenger” can be deleted from this label, and it is our understanding that this change is being considered by SVIA at this time.

Assuming that the “NEVER carry more than one passenger” is deleted, the Type I and Type II Age Recommendation Warning Labels for adults ATV’s would be identical, except that the hazard statement for the Type II would include the concept that the increased risk applies to both the operator and passenger. We believe using a modified hazard statement for the Type II Age Recommendation Label for Adult ATVs has merit and should be permitted in any CPSC regulation. We also note, however, that since this type of vehicle now falls within that definition of an ATV, the ANSI/SVIA text can be changed to use the term ATV instead of vehicle, as shown below:

Current ANSI/SVIA text:

Operating this vehicle if you are under the age of 16 increases your chances of severe injury or death to both rider and passenger.

Alternative text:

Operating this ATV if you are under the age of 16 increases the chance of severe injury or death to both operator and passenger

It is our recommendation that any CPSC regulation should use the Type II Age Recommendation Label specified by ANSI/SVIA-1-200X, after SVIA considers changes discussed above.

6.5. Comments regarding the Passenger Warning Label

6.5.1. Type I ATVs

The CPSC’s proposed rule would require that a Passenger Warning Label contain “the following, or substantially equivalent, statements: *‘Passengers can affect ATV balance and steering. The resulting loss of control can cause SEVERE INJURY or DEATH. NEVER ride as a passenger’*” (CPSC, 2006, proposed §1410.10(c)(2) and §1515.10(c)(2)).

As background, the Passenger Warning Label specified in the Consent Decrees (Consent Decree, 1988, Appendix C) was changed as a result of the recommendation by Miller Engineering, Inc., that a symbol be added to the Passenger Warning Label. According to Miller Engineering, “[T]his passenger symbol tested very well both as a component of the [General Warning Label] and in separate symbol tests; thus, we have no question that

⁷ Both the NPR and ANSI/SVIA-1-200X specify that both the General Warning Label and the Age Recommendation Warning Label be located so as to be visible to the operator when seated in the proper operating position.

these changes will improve the overall safety effectiveness potential of the [Passenger Warning Label]" (Miller Engineering, Inc., 1996, p. 2). The label proposed in ANSI/SVIA-1-2001 is essentially identical⁸ to that developed by Miller Engineering in concert with the CPSC and industry representatives (Miller Engineering, Inc., 1996, p. iv).

The Passenger Warning Label evaluated by staff at the CPSC Division of Human Factors, states "NEVER ride as a passenger. Passengers can cause a loss of control, resulting in SEVERE INJURY or DEATH." The staff stated,

"Although the label identifies the hazard as a "loss of control," how the presence of a passenger can lead to a loss of control is not stated. Consumers are unlikely to infer this missing information, which directly addresses the nature of the hazard. Thus, any mandatory [Passenger Warning Label] should include a more detailed description of the hazard—for example, "Passengers can affect ATV balance and steering. The resulting loss of control can cause SEVERE INJURY or DEATH" (Smith memo, May 23, 2006, p. 6).

We disagree with the CPSC proposed text and the CPSC staff evaluation. First, note that the phrase, "passengers can affect balance and steering" already appears in the General label where it is found with the words "and increase the risk of losing control." In contrast, the NPR's proposed use of the phrase, "passengers can affect ATV balance and steering" is followed by, "The resulting loss of control ...", which incorrectly suggests that every effect on balance will result in loss of control. Second, we are not aware of any testing related to the longer text proposed in the NPR. In contrast, the symbol and text used in the ANSI/SVIA-1-200X Passenger Warning Label has been tested (by Miller Engineering, Inc.) for comprehension and agreed upon by CPSC staff. It is therefore our recommendation the ANSI/SVIA-1-200X Passenger Warning Label should be used in the CPSC regulation.

6.5.2. Type II ATVs

The CPSC proposed rule specifies a Type II Passenger Warning Label directed toward the operator, located on the front fender, adjacent to the General Warning Label, including the statements:

"NEVER CARRY MORE THAN 1 PASSENGER

Never carry a passenger less than twelve (12) years old or twelve years old or older who is too small to firmly plant his/her feet on the footrests and to securely grab the handles.

⁸ The Passenger Warning Label proposed in ANSI/SVIA-1-200X uses left-aligned text; text in the Passenger Warning Label developed by Miller Engineering wraps around the symbol (ANSI/SVIA-1-200X, Draft as of September 7, 2006. Figure 12; Miller Engineering, Inc., 1996, p. iv).

Never allow a passenger to sit in a location other than the passenger seat.

Never carry a passenger who is not securely grasping the grip handles at all times.” (CPSC, 2006, proposed §1410.19(a)(2))

This proposed label is similar to that reviewed by CPSC staff (Smith memo, May 23, 2006, p. 7). CPSC staff, in evaluating a Passenger Warning Label for Type II ATVs, stated,

“The portion of the warning related to never carrying a passenger under the age of 12 suffers problems similar to the age recommendation warning label: The label fails to describe the reasons for the passenger-age recommendation. The Human Factors staff has not been presented with information describing the reasons for this recommendation, but if the reasons can be articulated the staff recommends that this information be included in the label” (Smith memo, May 23, 2006, pp. 7-8).

We first note that combining the age and size concepts into a single sentence, as found in the CPSC proposed rule, was considered during development of the Type II Passenger Warning Label and it was determined to be potentially confusing. It is our recommendation that the statement in the CPSC proposed rule should not be used.

In prior testing of the Passenger Warning Label, participants understood that both the age and size criteria were applicable, although one focus group member stated, “As long as they can firmly reach the handlebars [i.e. handholds] and put both feet down, I don’t think it matters what age they are” (ASE, 2003, p. 34). Comments such as this have recently led to a reconsideration of the need to include an age criterion in the standard, with the result that the ANSI/SVIA-1-200X Passenger Warning Label has eliminated the reference to age 12. One consideration was that the performance criteria, being large enough to “firmly plant feet on footrests” and “securely grasp handholds” provide the relevant performance requirements, and it has been recognized that many children under age 12 have this capability. Another consideration was that the age of the passenger on a Type II ATV has not been subject to regulation, so an age recommendation is not needed to assist with enforcement. It is our understanding that the ANSI/SVIA standard is considering a revision to permit manufacturers to add (or retain) a passenger age criterion if they choose to do so.

Based on the discussion above, it is our recommendation that the ANSI/SVIA 200X label be used in any CPSC regulation. We further specifically recommend avoiding the use of the NPR text that combines the age and size concepts into one sentence. We also suggest that manufacturers wishing to continue providing information about age be permitted to do so. Finally, it is our recommendation that any CPSC regulation should not restrict placement of this label to the fender, but instead adopt the placement provisions of ANSI/SVIA-1-200X, so that the label may be easily read by a potential passenger.

6.6. Comments regarding the Tire Pressure/Overloading Warning Label(s)

6.6.1. Type I ATVs

The CPSC's proposed provisions for Tire Pressure/Overloading Warning Labels are nearly identical to the requirements of the Consent Decrees (Consent Decree, 1988, H.1.a.(1)(d); CPSC, 2006, proposed §1410.10(d)(2) and §1515.10(d)(2)). CPSC staff reviewed and recommended Tire Pressure/Overloading Warning Label(s) as specified in the Consent Decrees, stating that the labels on most ATVs were generally consistent with those specified in the Consent Decrees (Smith memo, May 23, 2006, pp. 8-9).

ANSI/SVIA-1-200X proposes requirements for Type I Tire Pressure/Overloading Warning Labels that are consistent with the requirements of the Consent Decrees (see ANSI/SVIA-1-200X, Section 4.24.4.3 and Figure 11).

There is no conflict between the requirements of the CPSC proposed rule and ANSI/SVIA 200X. It is our recommendation that any CPSC regulation should maintain consistency with the Tire Pressure Warning Label provisions of ANSI/SVIA-1-200X.

6.6.2. Type II ATVs

The CPSC's proposed rule specifies that Type II ATVs meet the Tire Pressure/Overloading Warning Label requirements for Type I ATVs (CPSC, 2006, proposed §1410.19). In contrast, the ANSI/SVIA-1-200X proposes that Type II ATVs bear Tire Pressure/Overloading Warning Labels with additional information specific to Type II ATVs. This additional information includes information regarding trailer towing, calculating load, and instructions regarding operations when towing or loaded with cargo or passenger.

It is our recommendation that the SVIA Tire Pressure/Overloading Warning Label for Type II ATVs be adopted in any CPSC regulation.

6.7. Summary of Labeling Recommendations

The following summary of labeling recommendation is in addition to the age categorization recommendations previously discussed.

General recommendation to the CPSC:

- Use SVIA labels, including pictograms, within any CPSC regulation to increase clarity of the regulation, make compliance more straightforward and increase uniformity.

Label-specific recommendations to the CPSC:

- Type I General Warning Label – Any CPSC regulation should use the General Warning Label specified by ANSI/SVIA-1-200X for Type I ATVs.
- Type II General Warning Label – Any CPSC regulation should use the General Warning Label specified by ANSI/SVIA-1-200X for Type II ATVs, with the understanding that the ANSI/SVIA-1-200X draft will be changed to delete reference to specific “2-up” ATV training.
- Type I Age Recommendation Warning Label – Youth – Any CPSC regulation should use the Age Recommendation Labels for Type I Youth ATVs specified by ANSI/SVIA-1-200X for Type I ATVs. Specifically, the regulation should use the word “permit” as called for in ANSI/SVIA-1-200X.
- Type I Age Recommendation Warning Label – Adult – The “immature judgment” text and revisions suggested by the Commission should not be included in the regulation. Any CPSC regulation should use the Age Recommendation Warning Label specified by ANSI/SVIA-1-200X.
- Type II Age Recommendation Warning Label – As with the Type I label, the “immature judgment” text and revisions suggested by the Commission should not be included in the regulation. In addition, the Commission should permit including on the label the concept that under-age operation increases risk to both the operator and passenger.

More generally, any CPSC regulation should use the Type II Age Recommendation Label specified by ANSI/SVIA-1-200X, after SVIA considers changing the text of the hazard statement and deleting the instruction, “NEVER carry more than one passenger.”

- Type I Passenger Warning Label – Any CPSC regulation should use the Passenger Warning Label for Type I ATVs specified in ANSI/SVIA-1-200X.
- Type II Passenger Warning Label – Any CPSC regulation should use the Passenger Warning Label for Type II ATVs specified in

ANSI/SVIA-1-200X. Manufacturers wishing to continue providing information about age should be permitted to do so. In addition, any CPSC regulation should not restrict placement of this label to the fender, but instead adopt the placement provisions of ANSI/SVIA-1-200X.

- Type I Tire Pressure Warning Label – Any CPSC regulation should maintain consistency with the Tire Pressure Warning Label provisions of ANSI/SVIA-1-200X.
- Type II Passenger Warning Label – Any CPSC regulation should use the Tire Pressure Warning Label for Type II ATVs specified in ANSI/SVIA-1-200X.

Recommendations to the SVIA:

- Type II General Label – Delete the descriptor “2-up” within the statement referring to ATV training or instruction.
- Type II Age Recommendation Label – Consider revising the hazard statement and deleting the instruction, “NEVER carry more than one passenger.”
- Type II Passenger Warning Label – Consider whether or not an age criterion for passengers should be included or permitted on the label.

7. Summary of Findings and Recommendations

7.1. Age Recommendation Warning Label

Regarding the Age Recommendation Warning Label, the data from structured interviews showed the following results:

- Regardless of which label they were shown (NPR or SVIA version), 100% of the participants understood that, according to the label, a child under 16 should not operate an ATV with the label on it.
- The additional text and modified language suggested by the CPSC for the age label did not have a significant effect on any of the other measures including:
 - level of comfort associated with allowing their child to operate the ATV;
 - level of comfort associated with allowing children age 12, 13, 14, or 15 to operate the ATV;
 - level of comfort associated with purchasing an ATV for their child;
 - likelihood of considering the label in deciding whether or not to allow their child to ride the ATV;
 - likelihood of considering the label in deciding to purchase the ATV for use by their child;
 - the perceived maturity of their child relative to other children their age or to an average 16 year old; or
 - the perception of the percentage of children age 12, 13, 14, or 15 who would have mature enough judgment to operate the ATV
- There was a significant influence of the age of the child on a variety of measures. Collectively, the results indicate, as one might expect, that adults evidenced monotonically increasing expectations of similarity to 16 year olds as children increase in age. Parents thought some children between ages 12 and 15 (12 percent of 12 year olds, 19 percent of 13 year olds, 27 percent of 14 year olds, 36 percent of 15 year olds) had mature enough judgment to operate an ATV recommended for ages 16 and over regardless of which label they were shown. There are also indications that, at around age 14, the responses tended to transition from being "somewhat uncomfortable" to "somewhat comfortable" in allowing a mature teen to operate an Adult ATV with a recommended minimum operator age of 16 years old.

The focus group responses regarding the NPR's Age Recommendation Warning Label showed that participants generally had a negative reaction to the sentence: *"Even youth with ATV experience have immature judgment and should never drive an adult ATV."*

- Almost all participants believed that the sentence was not useful:
 - One participant thought the statement was "useless" and one called it "pointless"

- One participant thought “that [sentence] could just be taken off” and 5 of the other 6 participants in that group agreed. Three of four participants in the other group agreed
- Several found the sentence to be offensive
 - One participant said “*I take it more offensive because my child has experience.*” Three of the other 6 participants in that group agreed that it was offensive
 - One of these participants thought it would be “demeaning” to tell her child that she could not operate an ATV because she had immature judgment
 - Two participants in the other focus group thought the sentence was “insulting”
- Several participants found the sentence to lack credibility
 - One participant thought the statement was “ridiculous”
 - One thought that some people would laugh at the statement
 - Participants did not generally agree that the statement applied to all children

These data re-affirm that the Age Recommendation Warning Label specified in the 1988 Consent Decrees, currently in use, and proposed for use in ANSI/SVIA-1-200X is well understood. Thus, there is no indication that the alternative framing of the message in the proposed NPR label would have any effect on the understanding of the concept that adults should not let a child under 16 operate an ATV with the label on it. Moreover, there is evidence from focus groups with parents that this alternative framing may have negative effects on people’s perception of and response to the label. The proposed alternative text did not indicate benefits presumably intended. We recommend that the label proposed for use in ANSI/SVIA-1-200X be used in the CPSC regulation.

7.2. Regarding Categorization Systems

When considering the purchase of an ATV exclusively for use by a child under age 16, parents in this study preferred the SVIA system to the NPR system. In terms of one major criterion, keeping parents from purchasing Adult ATVs for children under 16, the SVIA system was clearly superior. Using the “first choice” “second choice” procedure described in section 5, there was not a single instance where a parent selected an NPR Youth model and then selected an Adult model as their second choice, while there are numerous instances of the converse. In other words, some participants (6 of 40) initially choosing a Transitional model would choose an Adult model when limited to the options in the NPR system, but no one initially choosing the NPR Teen model chose an Adult model when asked to make their “second choice” from the ANSI/SVIA system of classification of ages and speeds.

When participants considered purchases for use by their family, including a child age 12-15 as well as older children and adults, their initial preference was almost 3 times more likely to be from the SVIA system than the NPR system. In this purchase scenario, the Adult category was more preferred than all three of the other NPR options combined. Participants also preferred the SVIA system when buying for households with a child age 12 to 15 or when considering their own households.

In the interviews with youths, it was clear that their preference, initially, was to operate an Adult ATV. Despite this fact, these youth participants were significantly more willing to consider selecting the SVIA Transitional model than the NPR Teen model. These participants' ratings of preferences for ATV speeds also lend support to the notion that the SVIA Transitional model would be more attractive to them than the NPR Teen model.

Collectively, these results indicate that the SVIA categorization system is superior to the proposed NPR categorization system with respect to NPR's goal of increasing the likelihood of children under 16 operating age appropriate vehicles and reducing the likelihood of their operating adult size ATVs.

7.3. ATV Speeds

For 12- to 15-year-old operators, the NPR system proposes a maximum speed of 30 mph. Parents were asked about the relative attractiveness of alternative top speeds. The results show, in general, that maximum speeds lower than 30 mph (i.e., 15 and 22 mph) made a prospective ATV significantly less attractive, and that maximum speeds higher than 30 mph (i.e., 38 and 45 mph) made a prospective ATV significantly more attractive.

These parents did not appear to desire unlimited speed for children age 12 to 15. For example, they rated 38 mph as more attractive than 45 mph, even though 45 mph was preferred over 15 and 22 mph. Other data suggest that parents were looking for a maximum speed that would satisfy children as well as other family members. Data from interview participants and focus groups indicated that parents simply wanted an ATV that would be fast enough so children would not be bored, children could keep up with other family riders, other adult operators of the ATV would be satisfied, etc. Adults in this study reported that the speeds offered under the SVIA system were superior to the NPR system in these respects, as well as in terms of their adjustability.

We recommend adoption of the SVIA categorization system.

7.4 General Labeling Recommendations

Based on all the research and analyses conducted and as discussed in Section 6 of this document, we recommend that the CPSC adopt the labels specified by ANSI/SVIA-1-200X, with the understanding that the ANSI/SVIA-1-200X draft will be modified as previously described as part of the standard-development process.

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**Appendix A: Excerpts From ANSI/SVIA-1-200X
Draft as of September 7, 2006**

DRAFT 9/7/2006

American National Standard for Four Wheel All-Terrain Vehicles

1. Scope

This standard establishes minimum requirements for four wheel all-terrain vehicles, effective for models produced after the date this standard is approved, with the following exceptions: The provisions of the standard regarding Category Y-10 and Category T ATVs shall become effective four (4) years after the date of approval. ATVs which meet the definitions and other requirements of the standard for Category Y-10 and Category T may be produced, at the option of a manufacturer, prior to the effective date of those provisions. The definition and other requirements of the standard for Category Y-12 ATVs shall expire four (4) years after the date this standard is approved.

2. Referenced Standards

This standard is intended to be used with the following standards, recommended practices and information reports:

American National Standard Institute (ANSI) Standard ANSI Z535.4-2002, American National Standard for Product Safety Signs and Labels.¹

Code of Federal Regulations², Title 49, Subtitle B, Ch. V, Part 565, Vehicle Identification Number Requirements: SAE ICS – 1000 SEP04, Recreation Off-Road Vehicle Product Identification Numbering System: Part 571, Federal Motor Vehicle Safety Standards (FMVSS) and Part 574, Tire Identification and Record Keeping: Code of Federal Regulations, Title 40, Part 205, Subpart D Motorcycles, Appendix I-1, Test Procedure for Street and Off-Road Motorcycles.

European Union Electromagnetic Compatibility Standard, Council Directive 72/245/EEC as amended; and Directive 97/24/EC Chapter 8, Electromagnetic Compatibility.³

Society of Automotive Engineers Standards⁴, Standard J585 MAR00, Tail Lamps for Use on Motor Vehicles Less Than 2032 mm in Overall Width: Recommended Practice SAE J1623 FEB94, All-Terrain Vehicle Headlamps: Standard J586 MAR00, Stop Lamps for Use on Motor Vehicles Less Than 2032 mm in Overall Width: Recommended Practice SAE J278 MAY95, Snowmobile Stop Lamp, and Information Report: SAE J1451 FEB85, A Dictionary of Terms for the Dynamics and Handling of Single Track Vehicles.

Tire Size Nomenclature Standards.⁵

¹ Available from the National Electrical Manufacturers Association, 1300 North 17th Street, Rosslyn, VA 22209

² Available from the Superintendent of Documents, U.S. Printing Office, Washington, DC 20402

³ Available from the U.S. Dept. of Commerce, Office of EC Affairs, Rm. 3036, Washington, DC 20230

⁴ Available from the Society of Automotive Engineers, 400 Commonwealth Dr., Warrendale, PA 15096

⁵ Available from the Tire and Rim Association, 175 Montrose West Ave., Copley, OH or the Japan Automobile Tire Mfrs. Assn., Toranomon Bldg., 1-1-12, Toranomon, Minato-Ku, Tokyo 105, Japan

United States Department of Agriculture⁶, Forest Service Standard for Spark Arresters for Internal Combustion Engines, 5100-1C, dated September 1997.

3. Definitions

all-terrain vehicle (ATV). A motorized off-highway vehicle designed to travel on four low pressure tires, having a seat designed to be straddled by the operator and handlebars for steering control. .
ATVs are subdivided into two types as designated by the manufacturer.

Type I – A Type I ATV is intended for use by a single operator and no passenger.

Type II – A Type II ATV is intended for use by an operator or an operator and a passenger. It is equipped with a designated seating position behind the operator designed to be straddled by no more than one passenger.

Type I ATVs are further identified by three intended usage categories as follows:

(1) *Category G (General Use Model) ATV.* An ATV intended for recreational and utility use by an operator age 16 or older.

(2) *Category S (Sport Model) ATV.* An ATV intended for recreational use by an experienced operator, age 16 or older.

(3) *Category Y (Youth Model) ATV.* An ATV of appropriate size intended for recreational use under adult supervision by an operator under age 16. Youth model ATVs can further be categorized as follows:

(a) *Category Y-6 ATV.* A Category Y-6 ATV is a youth model ATV that is intended for use by children age 6 or older.

(b) *Category Y-10 ATV.* A Category Y-10 ATV is a youth model ATV that is intended for use by children age 10 or older.

(c) *Category Y-12 ATV.* A Category Y-12 ATV is a youth model ATV that is intended for use by children age 12 and older.

(4) *Category T (Transition Model) ATV.* A Category T ATV is a transitional model ATV of appropriate size that is intended for recreational use by an operator age 14 or older under adult supervision or an operator age 16 or older.

Type II ATVs are limited to one intended usage category as follows:

(1) *Category G (General Use Model) ATV.* An ATV intended for recreational and utility use by an operator age 16 or older and a passenger.

accessory. An object or device that is affixed to the ATV after its manufacture. It is not essential to the ATV's basic operation, but it changes its styling, convenience, utility, or effectiveness.

brake lever or handle. A hand-operated control which, when actuated, causes the brakes to be applied.

brake pedal. A foot-operated control which, when actuated, causes the brakes to be applied.

brake stopping distance (S). Distance traveled by an ATV from the start of a brake application to the point at which the ATV reaches a complete stop.

braking deceleration. The rate of change of vehicle speed from the point of initial brake application to the point where the vehicle stops.

⁶ Available from U.S. Department of Agriculture Forest Service, Equipment Division Center, San Dimas, CA 91773

- safety alert symbol and the signal words.
- (3) An introductory safety message emphasizing the importance of reading and understanding the manual prior to operation, the importance of and availability of a training course, and the importance of the age recommendation for the particular model.
 - (4) For Y-category and T category ATVs, an introductory notice to parents emphasizing that an ATV is not a "toy," the importance of adult supervision for operators under age 16, the importance of children completing a training course, and the importance of children understanding and following the instructions and warnings contained in the manual.
 - (5) An introductory safety section.
 - (6) An appropriate table of contents identifying the major sections of the manual.
 - (7) Descriptions of the location of warning labels on the ATV and an introductory statement emphasizing the importance of understanding and following the labels, and the importance of keeping the labels on the ATV. The introductory statement shall also contain instructions on how to obtain a replacement label in the event any label becomes difficult to read or comes off.
 - (8) A pre-operating inspection procedure and a statement emphasizing the importance of this procedure.
 - (9) A description of proper operating procedures and of potential hazards associated with improper operation of the vehicle. The section of each manual devoted to describing proper operating procedures shall include material addressing all of the topics addressed in the warning statements.
 - (10) Descriptions of proper maintenance, storage and transportation procedures.
 - (11) On the outside back cover, the contents of the general warning label.

4.23 ATV Identification Number. All ATVs shall have an appropriate identification number using either a PIN that is assigned by the manufacturer as prescribed in SAE ICS – 1000 SEP04, Recreation Off-Road Vehicle Product Identification Numbering System or a VIN as prescribed in Title 49 CFR, Ch. V Part 565.

4.24 Labels.

4.24.1 All ATVs shall be equipped with appropriate labels described as follows:

4.24.2 Format. Labels must comply with the requirements of American National Standards Institute (ANSI) Standard *ANSI 535.4-2002, Product Safety Signs and Labels*.

4.24.3 Durability. These labels shall meet the expected life requirements of American National Standards Institute (ANSI) Standard *ANSI 535.4-2002, Product Safety Signs and Labels*.

4.24.4 Contents of Labels – Type I ATVs

4.24.4.1 General Warning Label. Manufacturers will affix to every ATV a general warning label as shown in Figure 5.

4.24.4.1.1 Location. This label shall be affixed to the left front fender so as to be easily read by the operator when seated in the proper operating position.

4.24.4.2 Age Recommendation Warning Labels. Manufacturers shall affix a label

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describing the applicable age recommendation for the ATV and warning against underage usage as shown in Figures 6 - 10.

4.24.4.2.1 Location. This label shall be affixed to the ATV so as to be easily read by the operator when seated in the proper operating position.

4.24.4.3 Tire Pressure Warning Label. Manufacturers shall affix to every ATV a label warning about maintaining proper air pressure in the ATV's tires and a label warning about overloading. These labels may be combined as shown in Figure 11. Every label warning about improper tire pressure shall contain a statement indicating the recommended tire pressure(s). Tire pressure information may be stated on the label itself or provided by reference to the owner's manual or the tires. Every label warning against overloading shall contain a statement indicating the maximum weight capacity for the ATV model.

4.24.4.3.1 Location. The label (or labels) warning about improper tire pressure and overloading shall be affixed to the left rear fender above the axle, facing outward in such a position that it (they) can be read by the operator when mounting the vehicle.

4.24.4.4 Passenger Warning Label. Manufacturers shall affix to every Type I ATV a label warning against riding as a passenger on the ATV as shown in Figure 12.

4.24.4.4.1 Location. This label shall be affixed either to the body of the vehicle to the rear of the seat, on a flat surface, and toward the center of the vehicle, or to the seat of the vehicle, at the rear of the seat, so as to be easily read by a potential passenger. If neither of these locations is appropriate for a particular vehicle, the label shall be affixed to the left rear fender or left side of the body so as to be easily read by a potential passenger.

4.24.5 Contents of Labels – Type II ATVs

4.24.5.1 General Warning Label. Manufacturers will affix to every ATV a general warning label as shown in Figure 13.

4.24.5.1.1 Location. This label shall be affixed to the left front fender so as to be easily read by the operator when seated in the proper operating position.

4.24.5.2 Age Recommendation Warning Label. Manufacturers shall affix a label describing the applicable age recommendation for the ATV and warning against underage usage as shown in Figure 14.

4.24.5.2.1 Location. This label shall be affixed to the ATV so as to be easily read by the operator when seated in the proper position.

4.24.5.3 Tire Pressure Warning Label. Manufacturers shall affix to every ATV a label warning about maintaining proper air pressure in the ATV's tires and overloading as shown in Figure 15. Every label warning about improper tire pressure shall contain a statement indicating the recommended tire pressure(s). Tire pressure information may be stated on the label itself or provided by reference to the owner's manual or the tires. Every label warning against overloading shall contain a statement indicating the maximum weight capacity for the ATV model.

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4.24.5.3.1 Location. The label (or labels) warning about improper tire pressure and overloading shall be affixed to the left rear fender above the axle, facing outward in such a position that it (they) can be read by the operator when mounting the vehicle.

4.24.5.4 Passenger Warning Label. Manufacturers shall affix to every Type II ATV a label with warnings for a passenger on the ATV as shown in Figure 16.

4.24.5.4.1 Location. This label shall be affixed either to the body of the vehicle to the rear of the seat, on a flat surface, and toward the center of the vehicle, or to the seat of the vehicle, at the rear of the seat, so as to be easily read by a potential passenger.

4.25 Hang Tags. Every ATV shall be offered for sale with a hang tag that provides the appropriate age recommendation and information on the category of intended usage. The hang tag must be attached to the ATV and only removed by the first purchaser. Lost or damaged hang tags should be replaced.

4.25.1 Size. Every hang tag shall be at least 4 inches by 6 inches.

4.25.2 Content. At a minimum, every hang tag shall contain the following: On one side of the hang tag a reproduction of the general warning label as described in section 4.24.4.1 for Type I ATV's or 4.25.5.1 for Type II ATV's.

4.25.2.1 For Type I ATVs, the opposite side of the hang tag must include the following:

4.25.2.1.1 The category description, the intended use and the appropriate age recommendation for that category. The following must be included:

- For Category G:
GENERAL USE VEHICLE,
This ATV is for RECREATIONAL and UTILITY USE.
NO OPERATOR UNDER AGE 16
- For Category S:
SPORT MODEL,
This ATV is for RECREATIONAL USE BY EXPERIENCED OPERATORS ONLY,
NO OPERATOR UNDER AGE 16
- For Category Y:
Y-6, Y-10, or Y-12, (whichever is appropriate)
YOUTH MODEL,
This ATV is for RECREATIONAL USE BY YOUNG OPERATORS UNDER ADULT SUPERVISION,
NO OPERATOR UNDER AGE (use appropriate age 6, 10, or 12).
- For Category T:
TRANSITIONAL MODEL,
This ATV is for RECREATIONAL USE BY ADULTS or YOUNG OPERATORS UNDER ADULT SUPERVISION,
NO OPERATOR UNDER AGE 14.

4.25.2.1.2 The statement – “OPERATOR ONLY – NO PASSENGERS”

measurement shall be made when the ATV has reached a stabilized maximum speed. A maximum speed test shall consist of a minimum of two measurement test runs conducted over the same track, one each in opposite directions. If more than two measurement runs are made there shall be an equal number of runs in each direction. The maximum speed capability of the ATV shall be the arithmetic average of the measurements made. A reasonable number of preliminary runs may be made prior to conducting a recorded test.

6. Category Y and Category T ATV Speed Capability Requirements

6.1 Maximum Unrestricted Speed Capability. When tested in accordance with Section 5, with any removable speed limiting devices removed and with any adjustable speed limiting devices adjusted to provide the ATV's maximum speed capability, the maximum speed capability of Category Y-6 ATVs shall be 24 km/h (15 mph) or less, the maximum speed capability of Category Y-10 and Category Y-12 ATVs shall be 48 km/h (30 mph) or less, and the maximum speed capability of Category T ATVs shall be 61 km/h (38 mph) or less.

6.2 Maximum Limited Speeds. Speed limiting devices for Category Y-6 ATVs shall be capable of limiting maximum speed to 16 km/h (10 mph) or less when tested in accordance with Section 5. Speed limiting devices for Category Y-10 and Category Y-12 ATVs shall be capable of limiting maximum speed to 24 km/h (15 mph) or less when tested in accordance with Section 5. Speed limiting devices for Category T ATVs shall be capable of limiting maximum speed to 32 km/h (20 mph) and 48 km/h (30 mph) or less when tested in accordance with Section 5.

6.3 Speed Limiting Devices. All Category Y ATVs shall be equipped with a means of limiting throttle travel or other means of limiting the maximum speed attainable by the ATV. Category T ATVs shall be equipped with a means of limiting throttle travel or other means of limiting the maximum speed to 32 km/h (20 mph) and 48 km/h (30 mph) or less when tested in accordance with Section 5.

6.3.1 Tools Must be Necessary to Adjust or Remove Device. The means of limiting maximum speed may be adjustable or removable or both, but shall have means to prevent adjustment or removal without the use of tools or other specialized devices.

6.4 Delivery of ATV from Manufacturer. All Category Y and Category T ATVs shall be delivered from the manufacturer or its designee with the speed-limiting device adjusted to limit maximum speed as specified in 6.2.

7. Service Brake Performance

7.1 Test Conditions. Test conditions shall be as follows:

- (1) The ATV shall be tested at the appropriate test weight described below:
 - (a) If the vehicle load capacity specified by the manufacturer is 97.5 kg (215 lb) or more, the ATV test weight shall be the unloaded vehicle weight plus 97.5 kg (215 lb) (including test operator and instrumentation), with any added weight secured to the seat or cargo area(s) (if equipped).
 - (b) If the vehicle load capacity specified by the manufacturer is less than 97.5 kg (215 lb), the ATV test weight shall be the unloaded vehicle weight plus the vehicle load capacity (including test operator and instrumentation), with any added weight secured to the seat or cargo area(s) (if equipped).

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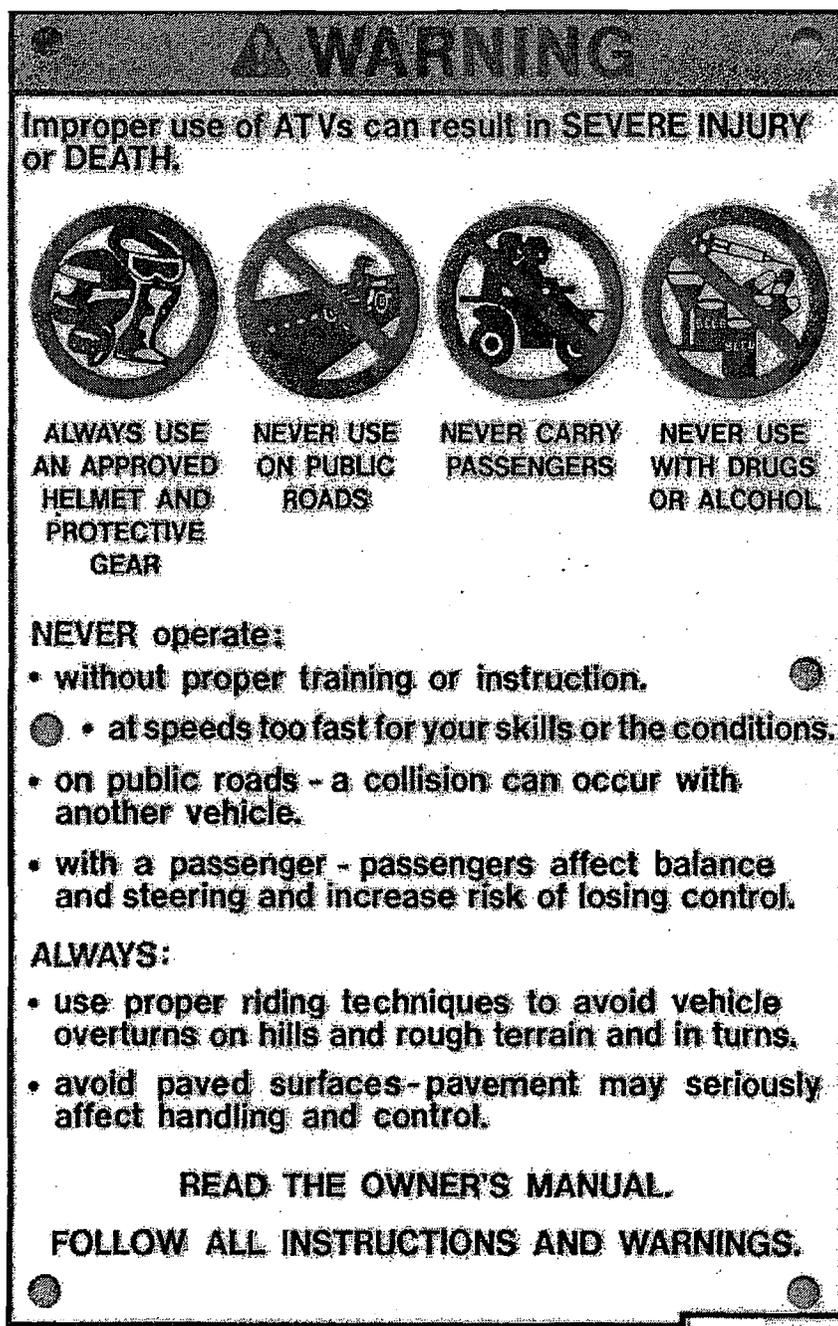


Figure 5
Type I General Warning Label

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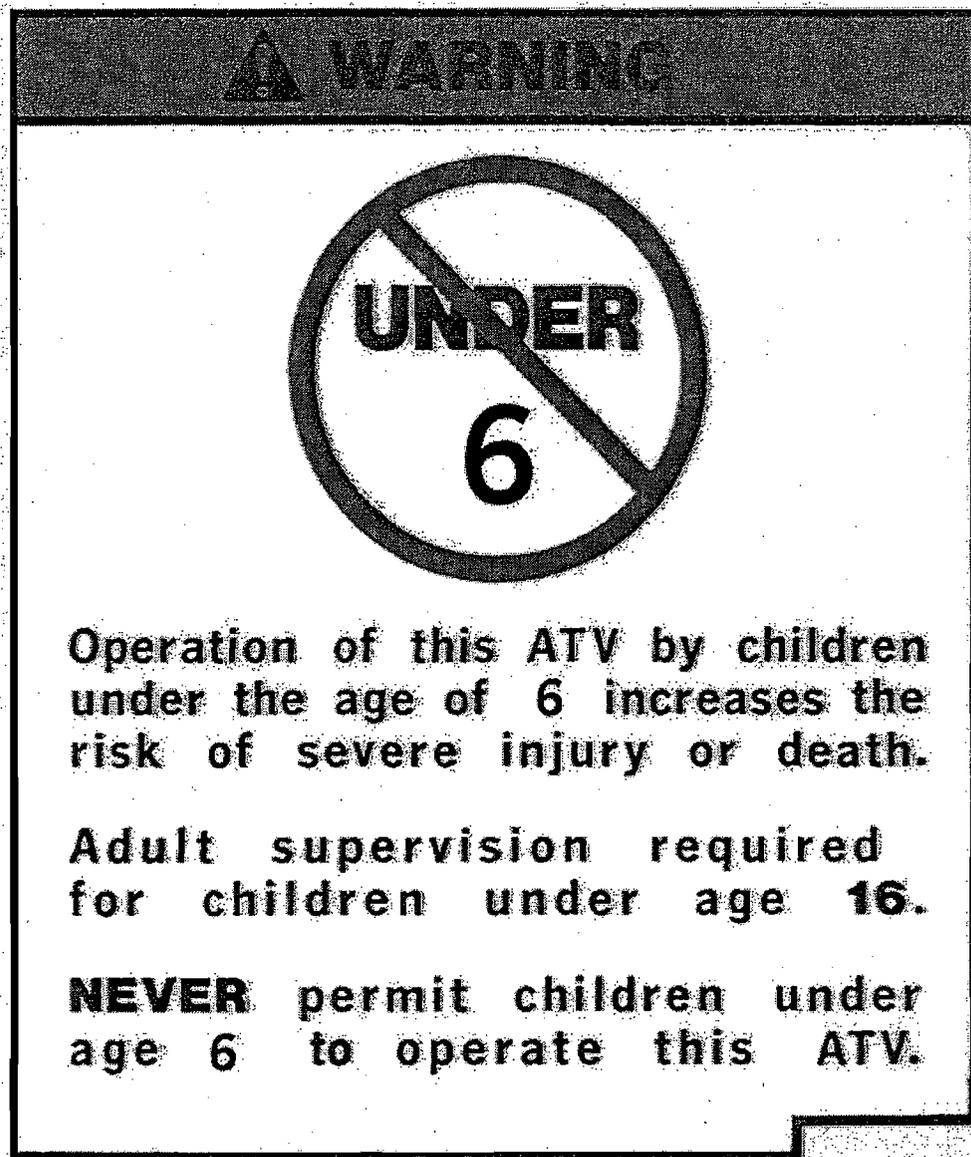


Figure 6
Type I Age Recommendation Warning Label
Category Y-6

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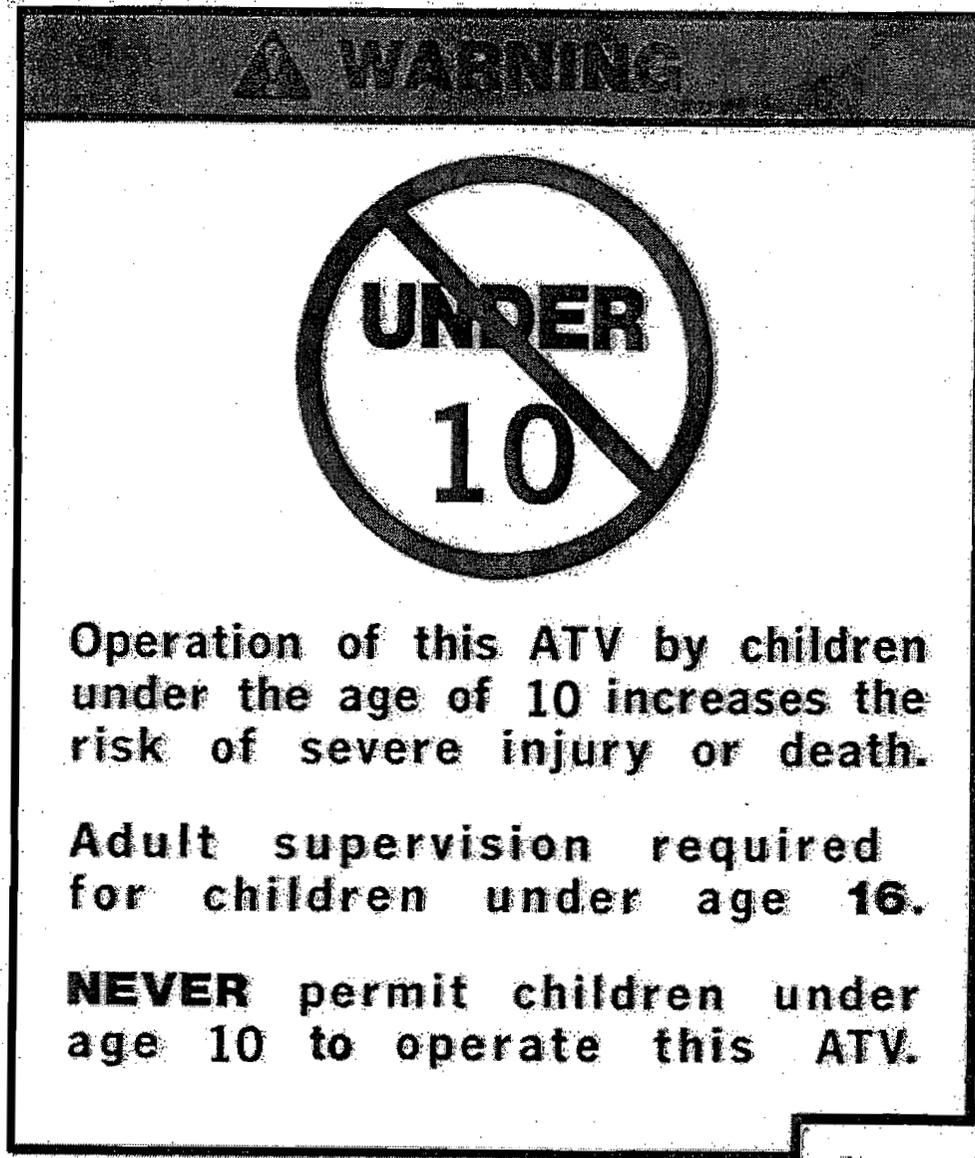


Figure 7
Type I Age Recommendation Warning Label
Category Y-10

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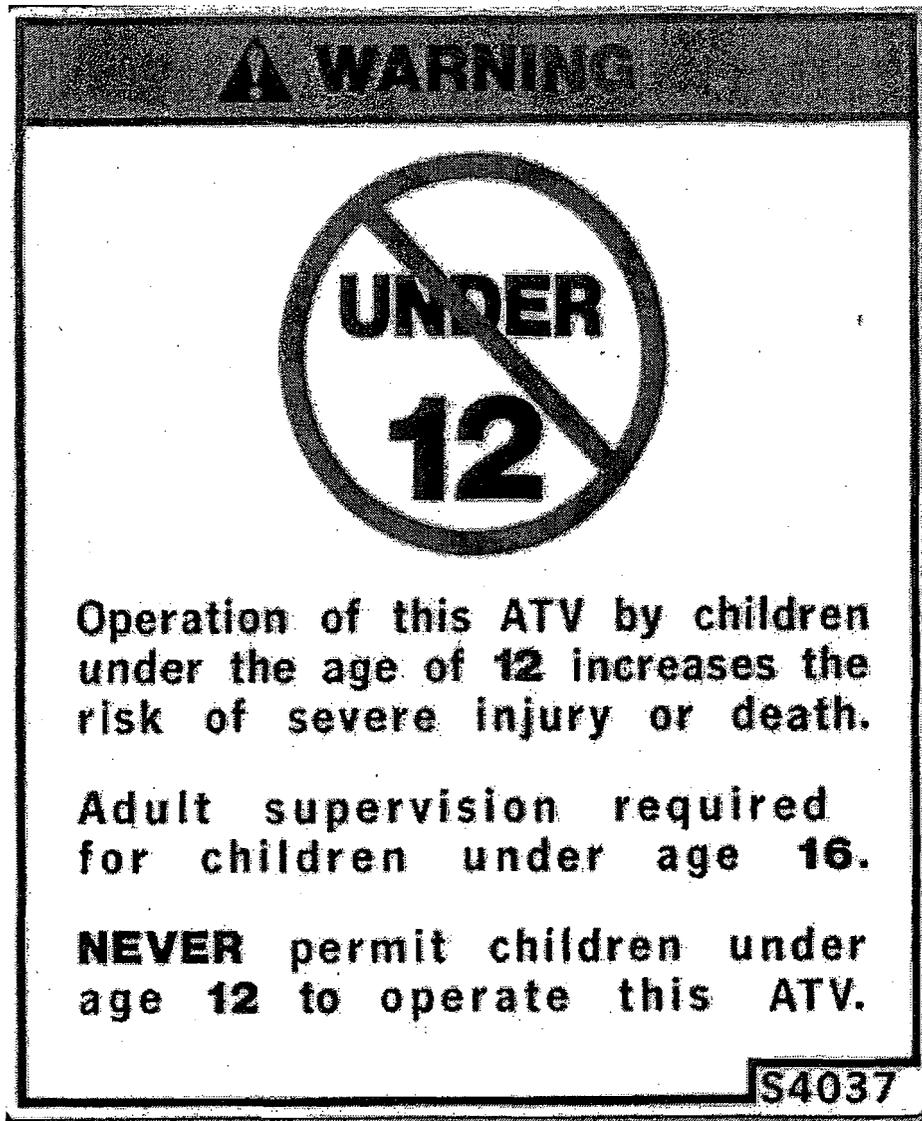


Figure 8
Type I Age Recommendation Warning Label
Category Y-12

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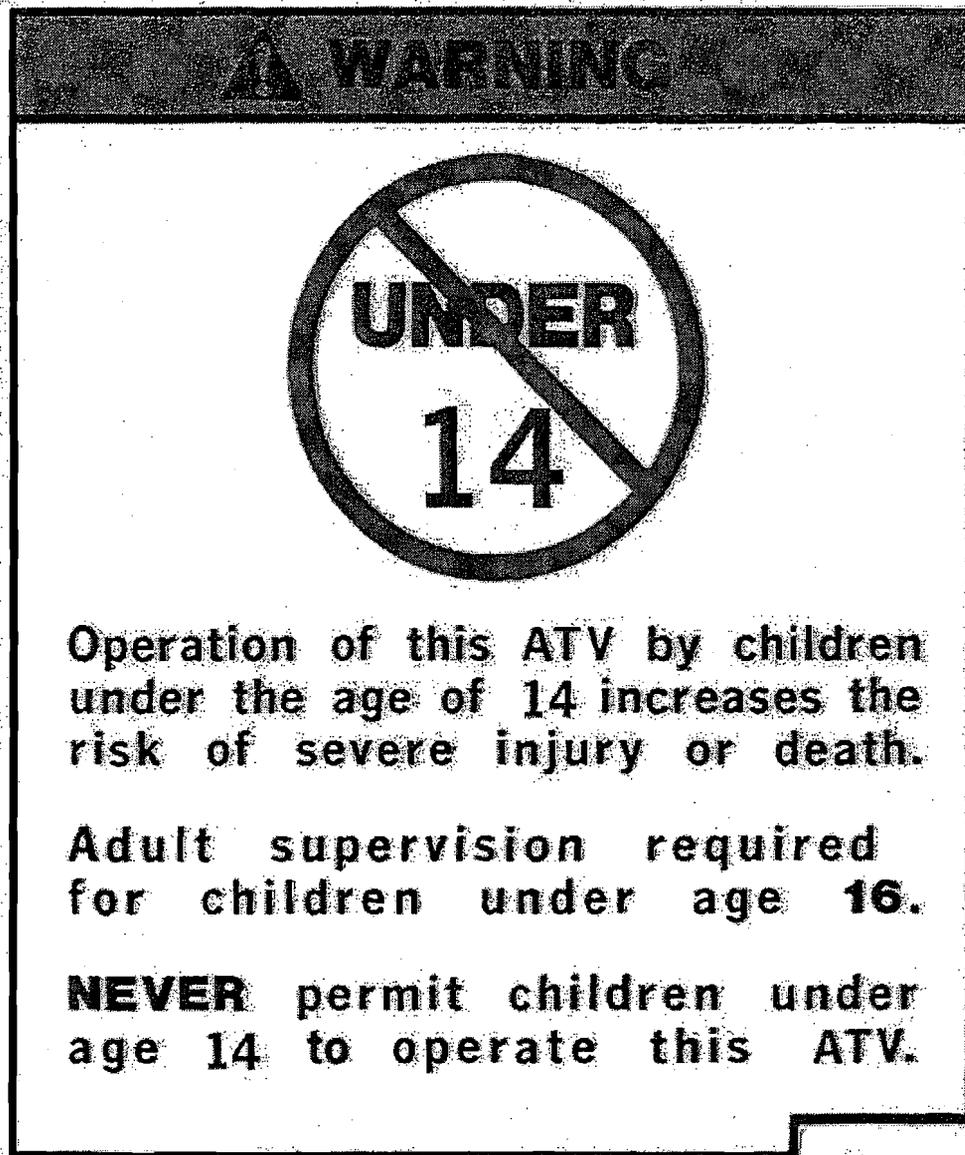


Figure 9
Type I Age Recommendation Warning Label
Category T

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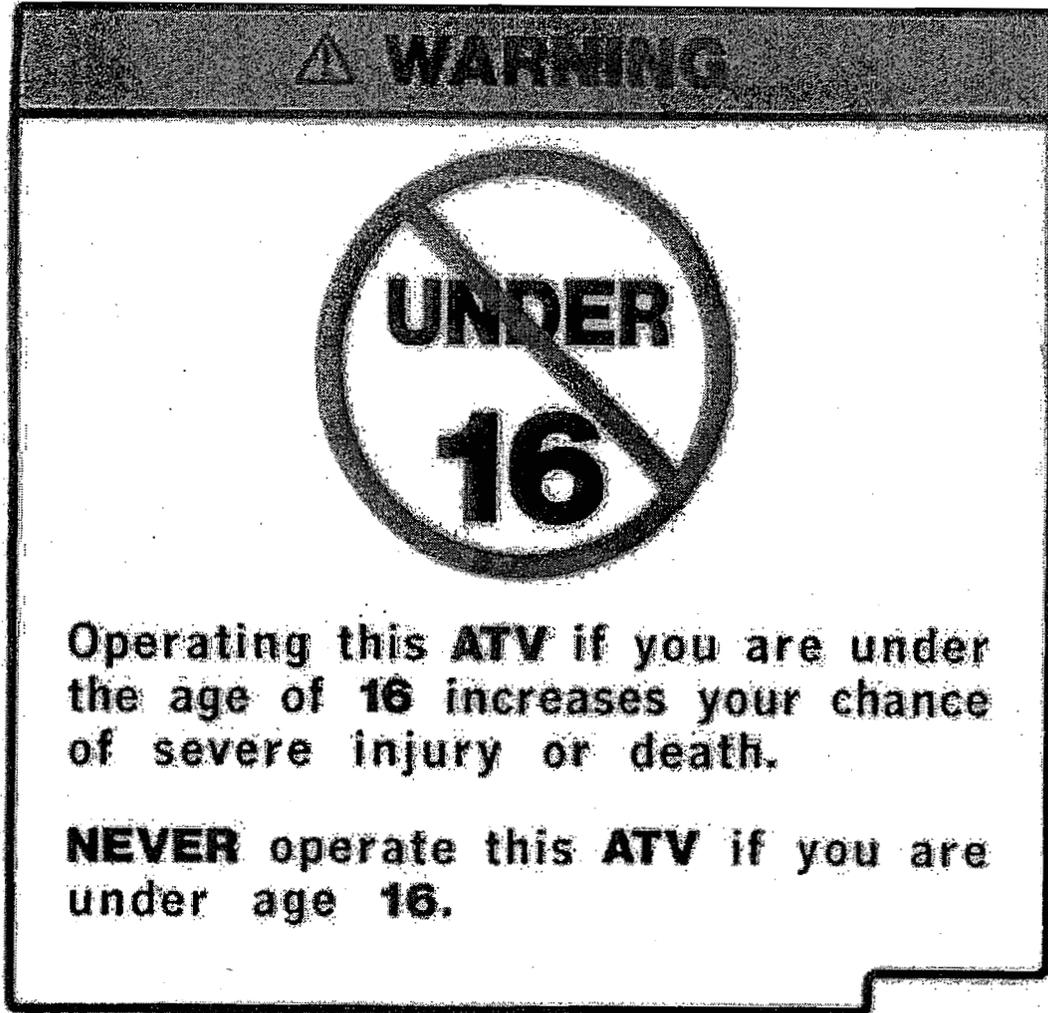


Figure 10
Type I Age Recommendation Warning Label
Category G or S

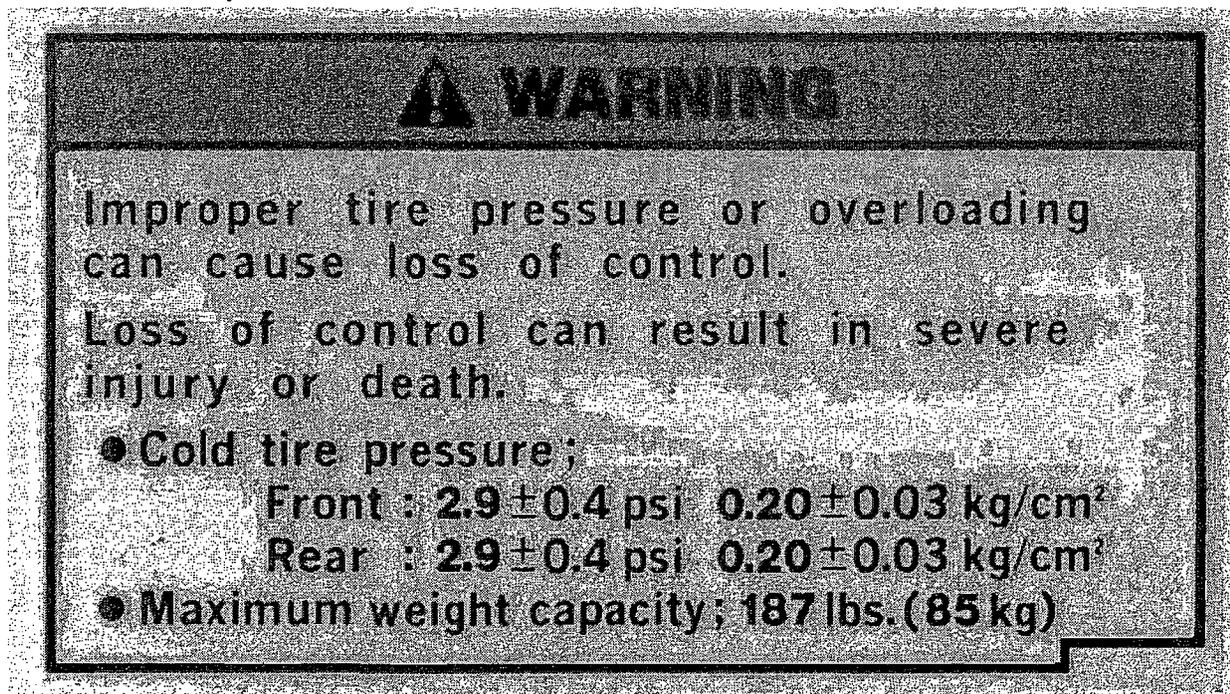


Figure 11
Type I Tire Pressure Warning Label

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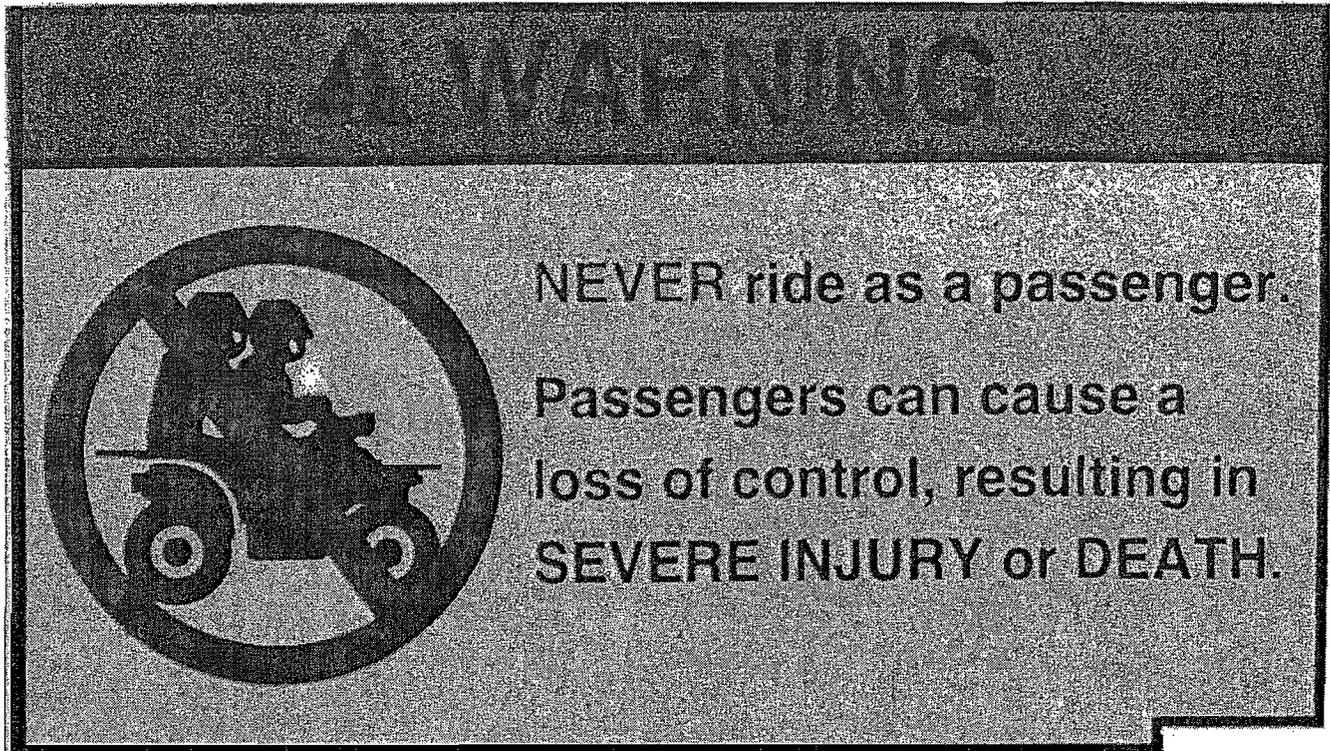
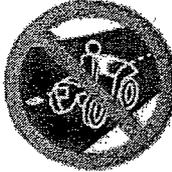
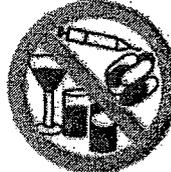


Figure 12
Type I Passenger Warning Label

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▲ WARNING

Improper use can result in SEVERE INJURY or DEATH

			
ALWAYS USE AN APPROVED HELMET AND PROTECTIVE GEAR FOR DRIVER AND PASSENGER	NEVER USE ON PUBLIC ROADS	NEVER CARRY MORE THAN 1 PASSENGER	NEVER RIDE AFTER USING DRUGS OR ALCOHOL

NEVER operate:

- without proper 2-up ATV training or instruction
- at speeds too fast for your skills or the conditions
- on public roads—a collision can occur with another vehicle

THE OPERATOR MUST ALWAYS:

- use proper riding techniques to avoid overturns on hills and rough terrain and in turns
- avoid paved surfaces—pavement may seriously affect handling and control
- reduce speed and use extra caution at all times when carrying a passenger—dismount passenger when conditions require
- make sure passenger reads and understands this label and passenger safety label

**LOCATE AND READ OPERATOR'S MANUAL
FOLLOW ALL INSTRUCTIONS AND WARNINGS**

Figure 13
Type II General Warning Label

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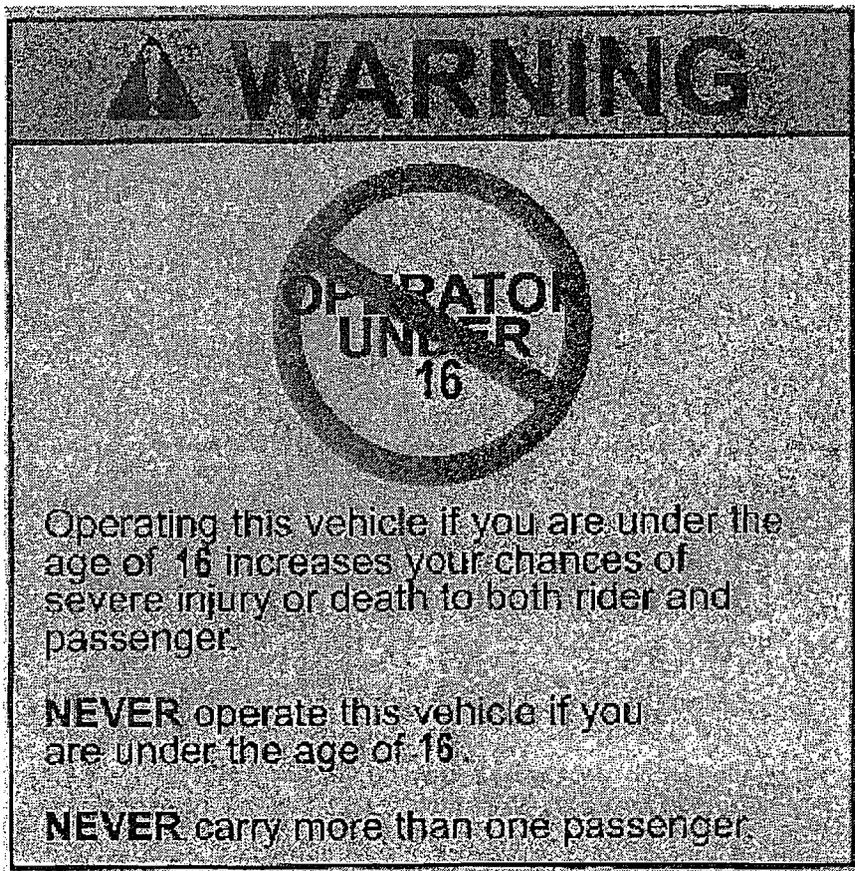


Figure 14
Type II Age Recommendation Warning Label

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▲ WARNING		
Improper tire pressure or over-loading can cause loss of control, resulting in severe injury or death. ALWAYS maintain proper tire pressure as shown.	LOAD	COLD TIRE PRESSURE
	UP TO 600 lbs (272 kg)	FRONT 5 psi (0.35 kg/cm ²) REAR 5 psi (0.35 kg/cm ²)
NEVER exceed the vehicle load capacity of 600 lbs. (272 kg) including weight of operator, passenger, cargo, accessories and, if applicable, trailer tongue weight.		
ATV LOADING and TRAILER TOWING		
<ul style="list-style-type: none">• Cargo/passenger loading or trailer towing can affect stability and handling• When loaded with cargo or a passenger or towing a trailer:<ul style="list-style-type: none">– reduce speed– allow more room to stop– avoid hills and rough terrain		

Figure 15
Type II Tire Pressure Warning Label
Note: Numbers are for illustration only.

▲ WARNING

PASSENGER SAFETY

To reduce the risk of SEVERE INJURY or DEATH

	
NEVER CARRY MORE THAN 1 PASSENGER	NEVER RIDE AFTER USING DRUGS OR ALCOHOL

NEVER carry a passenger too small to firmly plant feet on footrests and securely grasp hand holds.

THE PASSENGER MUST ALWAYS:

- use an approved helmet and protective gear
- securely grasp hand holds and plant feet firmly on footrests
- tell operator to slow down or stop if uncomfortable—get off and walk if conditions require

Figure 16
Type II Passenger Warning Label (Sample)

Appendix B: Study #1 (Adult) Sample Questionnaire

Date: _____

Participant: _____

Location: _____

Condition: 1 3

Testing Protocol (Parents)

INTRODUCTION

Excuse me, I work for a local research firm and we are conducting a study of parents' opinions of ATVs [point to picture]. The study takes about 25 minutes and pays \$30 for your participation. Would you be willing to participate?

Ok, first I need to ask you a few questions to see if you qualify to be a participant.

Qualifying questions about children's ages

1. Do you have any children between ages 10 and 18? Yes No
(If yes, go to question #2)
(If no, "Thank you for your time, but you do not qualify for the survey.")

Qualifying questions about children's interest in ATVs

2. Have any of your children ever operated an ATV? Yes No
(If yes, go to question #3)
(If no, go to question #2a)
- 2a. Would any of your children be likely to operate an ATV if given the opportunity? Yes No
(If yes, go to question #3)
(If no, "Thank you for your time, but you do not qualify for the survey.")

Qualifying questions about ATV ownership/use

3. Do you currently own an ATV? Yes No
(If yes, go to next page)
(If no, go to question #3a)
- 3a. Would you consider owning an ATV if cost wasn't a factor and you had a place to ride it? Yes No
(If yes, go to next page)
(If no, go to question #3b)
- 3b. Would you consider allowing your child to operate a friend, neighbor, or relative's ATV? Yes No
(If yes, go to next page)
(If no, "Thank you for your time, but you do not qualify for the survey.")

Date: _____

Participant: _____

Location: _____

Condition: 1 3

Questions about participant's children

Great, let's get started. In order to know which questions to ask, I first need to ask about your children's ages.

4. How many children do you have? _____

5. How many boys? _____
(If 0, skip question #5a)

5a. May I have their ages? _____

6. How many girls? _____
(If 0, skip question #6a)

6a. May I have their ages? _____

7. Which of your children have operated an ATV or would be likely to operate an ATV if given the opportunity? (circle responses in 5a and 6a above)

If any children likely to operate an ATV are age 10 to 15, note the age of the oldest one age 10 to 15 here: _____

Otherwise (if all children likely to operate an ATV are over 15) note the age of the youngest one age 16 to 18 here: _____

Context

Our study is about all-terrain vehicles (ATVs), sometimes called 4-wheelers or quads.

[Present ATV picture to respondent and point to parts as described below.]

The vehicles we're interested in are designed for off-road use by a single rider, and as you can see in the picture, have handlebars for steering and are designed to be straddled by the operator.

ATV models vary in size, weight, engine size, speed capabilities, and recommended operator age.

(Go to next page)

Date: _____

Participant: _____

Location: _____

Condition: 1 3

PART 1: LABEL

In the first part of our study, I'm going to ask you some questions about your impressions of a label on an ATV.

I'm going to show you a label that would be located here **[present ATV with arrow to participant]** on an ATV. To begin, please read this label **[present label to participant]**. When you are finished, please let me know.

Does participant have a child likely to operate an ATV between age 10 and 15? (see response to question #6)

(If yes, go to next page)

(If all children likely to operate an ATV are over age 15, go to page 6)

Questions for parents with a child likely to operate an ATV age 10-15

This first set of questions is about **one** of your children. Please think about your **[oldest child age 10 to 15 likely to operate an ATV] ___-year-old** when answering the next questions.

8a. Using this scale, how **comfortable** would you be **allowing your child to operate an ATV** with this label on it?

Very uncomfortable	Uncomfortable	Somewhat uncomfortable	Somewhat comfortable	Comfortable	Very comfortable						
<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr> <td style="width: 16.6%;"></td> </tr> </table>											
1	2	3	4	5	6						

9a. Using this scale, how **likely is it that you would consider this label** in deciding whether or not to **let your child operate the ATV**?

Very unlikely	Unlikely	Somewhat unlikely	Somewhat likely	Likely	Very likely						
<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr> <td style="width: 16.6%;"></td> </tr> </table>											
1	2	3	4	5	6						

10a. Using this scale, how **comfortable** would you be **purchasing an ATV** with this label on it for use by your child?

Very uncomfortable	Uncomfortable	Somewhat uncomfortable	Somewhat comfortable	Comfortable	Very comfortable						
<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr> <td style="width: 16.6%;"></td> </tr> </table>											
1	2	3	4	5	6						

11a. Using this scale, how **likely is it that you would consider this label** in deciding whether or not to **purchase this ATV** for use by your child?

Very unlikely	Unlikely	Somewhat unlikely	Somewhat likely	Likely	Very likely						
<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr> <td style="width: 16.6%;"></td> </tr> </table>											
1	2	3	4	5	6						

(Go to next page)

Date: _____

Participant: _____

Location: _____

Condition: 1 3

Now I have a couple questions about your understanding of this label.

12a. According to this label, should you let a child under age 16 operate an ATV with this label on it?

Yes No

(If no, skip questions #12b and 12c)

12b. Why?

12c. What is your understanding of what the label says about this?

13a. Using this scale, based on your review of the label, how important is it that the operator be 16 years or older?

Very unimportant	Unimportant	Somewhat unimportant	Somewhat important	Important	Very important
---------------------	-------------	-------------------------	-----------------------	-----------	-------------------

--	--	--	--	--	--

1 2 3 4 5 6

Now I have a couple more questions about your child.

14a. Using this scale, in terms of judgment, how mature is your child compared to others his/her age?

Much less mature	Less mature	Somewhat less mature	Same	Somewhat more mature	More mature	Much more mature
---------------------	----------------	-------------------------	------	-------------------------	----------------	---------------------

--	--	--	--	--	--	--

1 2 3 4 5 6 7

15a. Using this scale, in terms of judgment, how mature is your child compared to an average 16 year old?

Much less mature	Less mature	Somewhat less mature	Same	Somewhat more mature	More mature	Much more mature
---------------------	----------------	-------------------------	------	-------------------------	----------------	---------------------

--	--	--	--	--	--	--

1 2 3 4 5 6 7

(Go to page 8)

Questions for parents whose children likely to operate an ATV are all over age 15

This first set of questions is about **one** of your children. Please think about the time when your **[youngest child age 16 to 18 likely to operate an ATV] ___-year-old** was **14 years old** when answering the questions.

8b. Using this scale, how **comfortable** would you have been **allowing your child to operate** an ATV with this label on it?

Very uncomfortable	Uncomfortable	Somewhat uncomfortable	Somewhat comfortable	Comfortable	Very comfortable
1	2	3	4	5	6

9b. Using this scale, how **likely** is it that you would have **considered** this label in deciding whether or not to **let your child operate** the ATV?

Very unlikely	Unlikely	Somewhat unlikely	Somewhat likely	Likely	Very likely
1	2	3	4	5	6

10b. Using this scale, how **comfortable** would you have been **purchasing** an ATV with this label on it for use by your child?

Very uncomfortable	Uncomfortable	Somewhat uncomfortable	Somewhat comfortable	Comfortable	Very comfortable
1	2	3	4	5	6

11b. Using this scale, how **likely** is it that you would have **considered** this label in deciding whether or not to **purchase** this ATV for use by your child?

Very unlikely	Unlikely	Somewhat unlikely	Somewhat likely	Likely	Very likely
1	2	3	4	5	6

(Go to next page)

Date: _____

Participant: _____

Location: _____

Condition: 1 3

Now I have a couple questions about your understanding of this label.

12d. According to this label, should you let a child under age 16 operate an ATV with this label on it?

Yes No

(If no, skip questions #12e and 12f)

12e. Why?

12f. What is your understanding of what the label says about this?

13b. Using this scale, based on your review of the label, how important is it that the operator be 16 years or older?

Very unimportant	Unimportant	Somewhat unimportant	Somewhat important	Important	Very important
---------------------	-------------	-------------------------	-----------------------	-----------	-------------------

--	--	--	--	--	--

1
2
3
4
5
6

Now I have a couple more questions about your child.

14b. Using this scale, in terms of judgment, at age 14, how mature was your child compared to others his/her age?

Much less mature	Less mature	Somewhat less mature	Same	Somewhat more mature	More mature	Much more mature
---------------------	----------------	-------------------------	------	-------------------------	----------------	---------------------

--	--	--	--	--	--	--

1
2
3
4
5
6
7

15b. Using this scale, in terms of judgment, at age 14, how mature was your child compared to an average 16 year old?

Much less mature	Less mature	Somewhat less mature	Same	Somewhat more mature	More mature	Much more mature
---------------------	----------------	-------------------------	------	-------------------------	----------------	---------------------

--	--	--	--	--	--	--

1
2
3
4
5
6
7

(Go to next page)

Hypothetical questions for all parents

The next set of questions is **not** about your child. Instead, I'd like you to **imagine** you have a child like the one I'll describe.

16. Using this scale, if you had a **15-year-old** with mature judgment, how comfortable would you be allowing them to operate an ATV with this label on it?

Very uncomfortable	Uncomfortable	Somewhat uncomfortable	Somewhat comfortable	Comfortable	Very comfortable
1	2	3	4	5	6

17. How about a **14-year-old** with mature judgment?

Very uncomfortable	Uncomfortable	Somewhat uncomfortable	Somewhat comfortable	Comfortable	Very comfortable
1	2	3	4	5	6

18. How about a **13-year-old** with mature judgment?

Very uncomfortable	Uncomfortable	Somewhat uncomfortable	Somewhat comfortable	Comfortable	Very comfortable
1	2	3	4	5	6

19. How about a **12-year-old** with mature judgment?

Very uncomfortable	Uncomfortable	Somewhat uncomfortable	Somewhat comfortable	Comfortable	Very comfortable
1	2	3	4	5	6

20. Out of 100 **15-year-olds**, how many do you think have mature enough judgment to be able to operate an ATV recommended for ages 16 and over? *(place number in data table below)*
(Repeat question #18 for 14-year-olds, 13-year-olds, and 12-year-olds)

15-yr-old	14-yr-old	13-yr-old	12-yr-old
20.	21.	22.	23.

(Go to next page)

Date: _____

Participant: _____

Location: _____

Condition: 1 3

PART 2: CATEGORIZATION

Ok, now I'd like to start the second part of the study.

Right now, there are **different categories** of ATVs that are recommended for **different ages**.

Here is a chart that has **two different sets of ATV categories** based on operator age recommendations [**present chart without speeds to participant**]. **These are both different from the set of ATV categories that are currently used.** I am going to talk with you about both sets and then ask you some questions about which set you prefer and what kinds of ATVs you would be inclined to purchase.

Explanation of chart without speeds

This first chart shows ATV categories that are recommended for certain age groups [**point to age columns**].

You can see that under **Set A**, there is [**point to each category as follows**]:

- a **Junior** category recommended for ages **6 through 8**,
- a **Preteen** category recommended for ages **9 through 11**,
- a **Teen** category recommended for ages **12 through 15**, and
- an **Adult** category recommended for ages **16 and up**.

Under **Set B**, there is [**point to each category as follows**]:

- a **Y-6** category, which is a youth category recommended for ages **6 through 9**,
- a **Y-10** category, which is a youth category recommended for ages **10 through 13**,
- a **T** category which is a transitional category recommended for ages **14 and up including adults**, and also
- an **Adult** category recommended for ages **16 and up**.

The grey line in the chart [**point to grey line**] indicates that the **Transitional** category is intended for **14 and 15 year olds as well as adults**. The **Adult** ATVs [**point to category**] are intended for those over 16 years old.

(Go to next page)

Date: _____

Participant: _____

Location: _____

Condition: 1 3

Explanation of chart with speeds

This **second chart [present chart with speeds to participant]** is the same as the first chart, except that it also gives information about the top speeds in each category. Where you see more than one speed in a category, that means that the top speed can be adjusted by the owner **[point to speeds as follows]**.

- So, for instance, looking at the **pre-teen ATV and the Y-6**, these ATVs come from the factory with the top speed set at **10 mph**, but they can be adjusted to allow riders to go up to **15 mph**.
- Similarly, the **Y-10 and Teen** categories come from the factory with the top speed set at **15 mph**, but can also be adjusted to allow riders to go up to **30 mph**.
- The **Transitional or "T" category** ATV comes from the factory with the top speed set at **20 mph**, but can also be adjusted to allow riders to go up to **30 mph** or up to **38 mph**.
- **Adult ATVs** are **not** set at a particular speed at the factory and they do not have devices to limit how fast riders can go. Some adult models go up to **60 or 70 mph**.

Do you understand what the numbers in the chart mean? If you have questions about this chart at any time, please ask me.

(Go to next page)

Questions about purchasing an ATV for 6- to 15-year-olds (single-rider scenario)

Now I would like to ask you some questions using this chart. I would like you to assume that you have a child who is interested in operating ATVs and that you want to buy one for him or her. Please also assume that you don't already own any ATVs and you will only be buying the one. First, assume that you want to buy an ATV for a 6-year-old child.

		Set A			Set B			
		Junior	Preteen	Teen	Y-6	Y-10	T	Adult
24. – 25.	6 year							
26. – 27.	7 year							
28. – 29.	8 year							
30. – 31.	9 year							
32. – 33.	10 year							
34. – 35.	11 year							
36. – 39.	12 year							
40. – 43.	13 year							
44. – 47.	14 year							
48. – 51.	15 year							

Questions to ask for each age 6-15 (single-rider scenario)

24. Of all the options on this chart, which category ATV would you be most likely to purchase in this situation?

(Place an "A" in the data table)

(Say once) Please keep in mind, we want to know your personal opinions and not what you think might be the most "correct" answer.

25. Of only the options in Set [not chosen as "A"], which category of ATV would you be most likely to purchase in this situation?

(Place a "B" in the data table)

(For ages 7-15: "Now please assume you want to buy an ATV for a(n) ___ [7 / 8 / ... / 14 / 15]-year-old child." Repeat questions #24 and 25) (After age 15, go to next page)

Questions about purchasing an ATV for a household (multiple-rider scenario)
--

Now I'd like to ask you about a different scenario.

Please assume that you would like to buy one ATV for multiple people in your family who are interested in riding it. Assume that you don't have another ATV and you're looking to buy just one. Assume the people interested in riding include a **12-year-old** as well as older children or adults.

		Set A			Set B			
		Junior	Pre-Teen	Teen	Y-6	Y-10	T	Adult
52. – 53.	12 year							
54. – 55.	13 year							
56. – 57.	14 year							
58. – 59.	15 year							

<i>Questions to ask for each age 12-15 (multiple-rider scenario)</i>
--

52. **Of all the options on this chart,** which category ATV would you be most likely to purchase **for your household** in this situation?

(Place an "A" in the data table)

53. **Of only the options in Set [not chosen as "A"],** which category of ATV would you be most likely to purchase **for your household** in this situation?

(Place a "B" in the data table)

*(For ages 13-15: "Now please assume the people interested in riding include a ___ [13 / 14 / 15]-year-old child."
Repeat questions #52 and 53)*

(After age 15, go to next page)

Date: _____

Participant: _____

Location: _____

Condition: 1 3

Questions about purchasing an ATV for a participant's household (personal scenario)

Now I'd like to ask you **your own** situation.

Please assume that you would like to buy one ATV for your own household. Assume that you don't have another ATV and you're looking to buy just one.

	Set A				Set B				
	Junior	Pre-Teen	Teen	Adult	Y-6	Y-10	T	Adult	Adult
60. – 61.									

60. Of all the options on this chart, which category ATV would you be most likely to purchase for your household?

(Place an "A" in the data table)

(Say once) Again, please keep in mind, we want to know your personal opinions and not what you think might be the most "correct" answer.

61. Of only the options in Set [not chosen as "A"], which category of ATV would you be most likely to purchase for your household?

(Place a "B" in the data table)

(Go to next page)

Date: _____

Participant: _____

Location: _____

Condition: 1 3

Questions about alternate speeds for Teen model ATV

Now I'm going to ask you some questions about ATV speeds.

62. Suppose that you had a **12- or 13-year-old** and were interested in purchasing an ATV **just for him or her**. The recommended ATV for this age range in Set A is the Teen ATV which has a top speed of 30 mph.

(For questions 62. – 65. ask questions from table, placing numbers in data table and continuing down each column.)

66. Now suppose that you had a **14- or 15-year-old** and were interested in purchasing an ATV **just for him or her**. The recommended ATV for this age range in Set A is the Teen ATV which has a top speed of 30 mph.

(For questions 66. – 69. ask questions from table, placing numbers in data table and continuing down each column.)

70. Now please consider the situation where you would like to buy **one ATV for multiple people in your family** who are interested in riding it. Assume that you don't have another ATV and you're looking to buy just one. Assume the people interested in riding include a **12- or 13-year-old** as well as older children or adults.

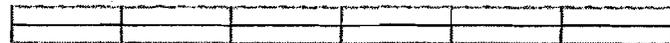
(For questions 70. – 73. ask questions from table, placing numbers in data table and continuing down each column.)

74. Now please consider the same situation where you would like to by **one ATV for multiple people in your family**, and that you don't have another ATV and are looking to buy just one. But this time, assume that the people interested in riding include a **14- or 15-year-old** as well as older children or adults.

(For questions 74. – 77. ask questions from table, placing numbers in data table and continuing down each column.)

	<i>(For each situation described above)</i>			
	62.	66.	70.	74.
Assume for a moment that the Teen category could be adjusted to also allow a top speed of 38 mph in addition to 30 mph . Please use this scale to tell me how much more or less attractive this category would be to purchase in this situation with this different top speed.				
How about if the Teen category had a top speed of 22 mph instead of 30 mph?	63.	67.	71.	75.
How about if the Teen category could be adjusted to also allow a top speed of 45 mph in addition to 30 mph?	64.	68.	72.	76.
How about if the Teen category had a top speed of 15 mph instead of 30 mph?	65.	69.	73.	77.

Much less attractive Less attractive Somewhat less attractive About the same Somewhat more attractive More attractive Much more attractive



1 2 3 4 5 6 7

(Go to next page)

Date: _____

Participant: _____

Location: _____

Condition: 1 3

General questions about participant's preferred set

We're almost finished. I'd like to ask you a few more general questions about the categories.

- 78.** If you were in the market to purchase an ATV for your family to use and the people interested in riding it included a 12- to 15-year-old as well as older children or adults, would you prefer to have the options in Set A or Set B?

Set A Set B

- 79.** If you had a child between ages 6 and 11, and were in the market to purchase an ATV just for him or her, would you prefer to have the options in Set A or Set B?

Set A Set B

- 80.** If you were in the market to purchase just one ATV for your own household, would you prefer to have the options in Set A or Set B?

Set A Set B

PART 3: DEMOGRAPHIC INFO

Before we wrap up, I would like to ask you a few background questions.

- 81.** Have you ever operated an ATV?

Yes No
(If yes, ask questions #82a-82b)
(If no, go to question #83)

Questions to ask participants who have operated ATVs

- 82a.** How many times have you operated an ATV? (circle one)

Once

More than once, less than 10 times

10 to 20 times

More than 20 times

- 82b.** In what state(s) have you operated an ATV? (list all)

(go to question #83)

Date: _____

Participant: _____

Location: _____

Condition: 1 3

Question to ask all participants

83. How many people in your household, other than yourself, have ever operated ATVs? _____

Does participant own an ATV? (See response to question #3 on page 1.)

(If yes, go to question #84a)

(If no, go to question #84b)

Questions to ask participants who own ATVs

84a. How many ATVs do you own? _____

85a. What kinds of ATVs do you own?
Make / Model / Engine size _____

Make / Model / Engine size _____

Make / Model / Engine size _____

(Use additional space if necessary)

(Go to question #86)

Questions to ask participants who do not own ATVs

84b. Have you owned ATV(s) in the past? Yes No

85b. Are you considering purchasing an ATV in the next couple of years? Yes No

(Go to question #86)

Questions to ask all participants

86. If you don't mind my asking, how old are you? _____

87. What is your occupation? _____

88. What is the highest level of schooling you completed? (circle)

Some high school

High school graduate

Some college

College Graduate

Some post-graduate or more

(Go to next page)

Date: _____

Participant: _____

Location: _____

Condition: 1 3

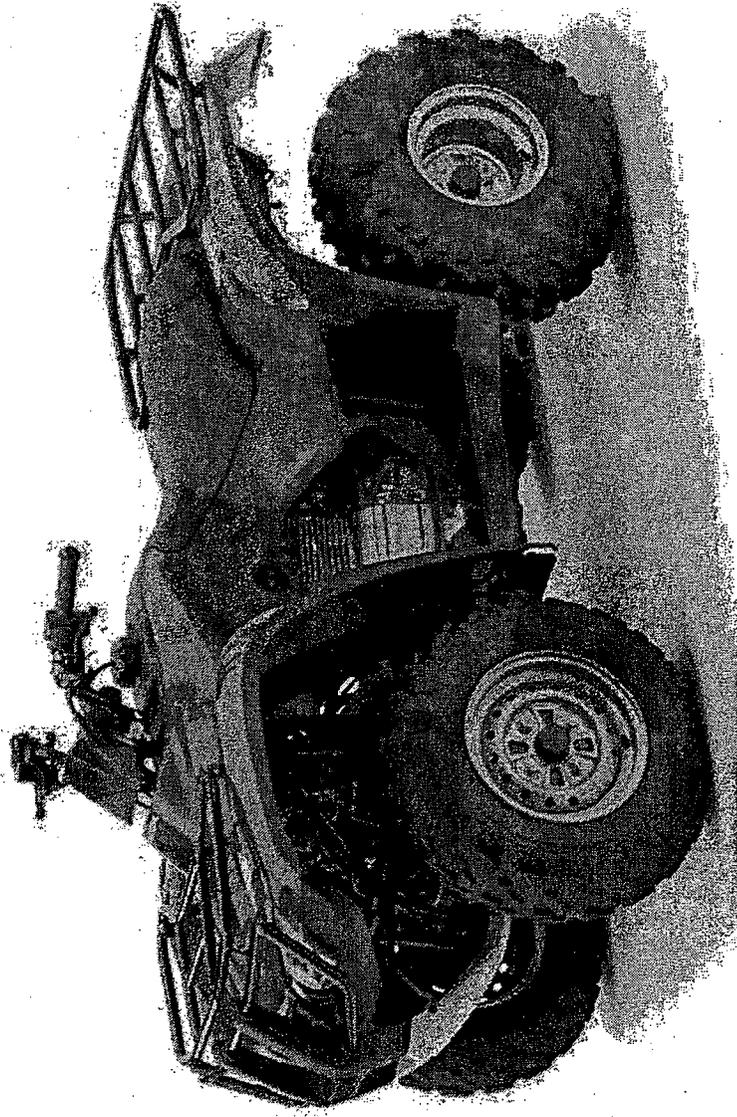
89. Other notes (where participant is from, context of use, etc.):

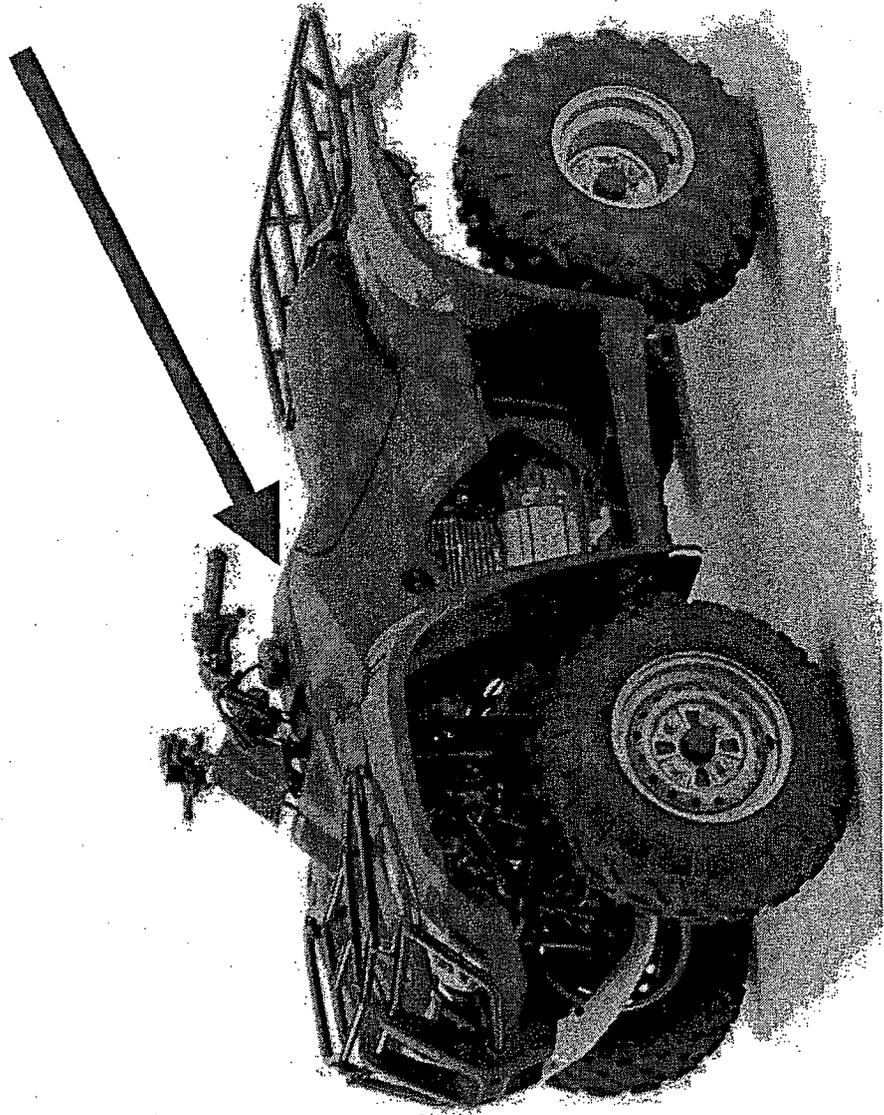
Please note participant's gender here:

Male Female

Thank you very much for your time today. I really appreciate your participation.

Appendix C: Study #1 (Adult) Pictures and Charts





⚠ WARNING



Operating this **ATV** if you are under the age of **16** increases your chance of severe injury or death.

NEVER operate this **ATV** if you are under age **16**.

WARNING



Even youth with ATV experience have immature judgment and should never drive an adult ATV.

Letting children under the age of **16** operate this **ATV** increases their risk of severe injury or death.

NEVER let children under age **16** operate this **ATV**.

Age	Set A	Set B	Age		
6	Junior	Y-6 (Youth)	6		
7			7		
8			8		
9	Pre-Teen		Y-10 (Youth)	9	
10				10	
11				11	
12	Teen			T (Transitional)	12
13					13
14					14
15	Adult	Adult	15		
16+			16+		

Age		Set A	Set B	Age
6	6	Junior 10 mph	Y-6 (Youth) 10 mph 15 mph	6
7	7			
8	8			
9	9	Pre-Teen 10 mph 15 mph	Y-10 (Youth) 15 mph 30 mph	9
10	10			
11	11			
12	12	Teen 15 mph 30 mph	T (Transitional) 20, 30, 38 mph	12
13	13			
14	14			
15	15	Adult No limit (up to 60-70 mph)	Adult No limit (up to 60-70 mph)	15
16+	16+			

Appendix D: Study #2 (Youth) Sample Questionnaire

Date: _____

Participant: _____

Location: _____

Condition: 1

Testing Protocol (Youth)

INTRODUCTION

[Select potential participants who look like they are between 10 and 18]

Excuse me, I work for a local research firm and we are conducting a study of opinions of ATVs [point to picture]. The study takes about 10 minutes and pays \$10 for your participation.

- **If child only:** Would you be willing to participate?
- **If child with parent:** Would you be willing to let your child participate?

Ok, first I need to ask you a few questions to see if you qualify to be a participant.

Qualifying questions about interest in ATVs

1. Have you ever operated an ATV? **Yes No**
(If yes, go to next page)
(If no, go to question #1b)
- 1b. Would you be likely to operate an ATV if given the opportunity? **Yes No**
(If yes, go to next page)
(If no, "Thank you for your time, but you do not qualify for the survey.")

Date: _____

Participant: _____

Location: _____

Condition: 1

Question about participant's age

Great, let's get started. I would like to ask you some questions about your opinions about different types of ATVs. But first, in order to know which questions to ask, I need know your age.

2. What is your age? _____

PART 1: CATEGORIZATION

Right now, there are **different categories** of ATVs that are recommended for **different ages**.

Here is a chart that has **two different sets of ATV categories** based on operator age recommendations [**present chart without speeds to participant**]. **These are both different from the set of ATV categories that are currently used.** I am going talk with you about both sets and then ask you some questions about which set you prefer and what kinds of ATVs you would like to have.

Explanation of chart without speeds

This first chart shows ATV categories that are recommended for certain age groups [**point to age columns**].

You can see that under **Set A**, there is [**point to each category as follows**]:

- a **Junior** category recommended for ages **6 through 8**,
- a **Preteen** category recommended for ages **9 through 11**,
- a **Teen** category recommended for ages **12 through 15**, and
- an **Adult** category recommended for ages **16 and up**.

Under **Set B**, there is [**point to each category as follows**]:

- a **Y-6** category, which is a youth category recommended for ages **6 through 9**,
- a **Y-10** category, which is a youth category recommended for ages **10 through 13**,
- a **T** category which is a transitional category recommended for ages **14 and up including adults**, and also
- an **Adult** category recommended for ages **16 and up**.

The grey line in the chart [**point to grey line**] indicates that the **Transitional** category is intended for **14 and 15 year olds as well as adults**. The **Adult ATVs** [**point to category**] are intended for those over 16 years old.

(Go to next page)

Date: _____

Participant: _____

Location: _____

Condition: 1

Explanation of chart with speeds

This **second chart [present chart with speeds to participant]** is the same as the first chart, except that it also gives information about the top speeds in each category. Where you see more than one speed in a category, that means that the top speed can be adjusted by the owner **[point to speeds as follows]**.

- So, for instance, looking at the **pre-teen ATV and the Y-6**, these ATVs come from the factory with the top speed set at **10 mph**, but they can be adjusted to allow riders to go up to **15 mph**.
- Similarly, the **Y-10 and Teen** categories come from the factory with the top speed set at **15 mph**, but can also be adjusted to allow riders to go up to **30 mph**.
- The **Transitional or "T" category ATV** comes from the factory with the top speed set at **20 mph**, but can also be adjusted to allow riders to go up to **30 mph** or up to **38 mph**.
- **Adult ATVs** are **not** set at a particular speed at the factory and they do not have devices to limit how fast riders can go. Some adult models go up to **60 or 70 mph**.

Do you understand what the numbers in the chart mean? If you have questions about this chart at any time, please ask me.

(If participant is 15 years old or younger, go to next page)

(If participant is over 15 years old, go to page 5)

Date: _____

Participant: _____

Location: _____

Condition: 1

Questions to ask participants 15 years old and younger

	Set A				Set B			
	Junior	Preteen	Teen	Adult	Y-6	Y-10	T	Adult
3a. – 6a.								

Questions about categories participant would most want to have

3a. Of all the options on this chart, which category ATV would you most want to have? *(place an "A" in the data table)*

Please keep in mind, we want to know your personal opinions and not what you think might be the most "correct" answer.

4a. Of only the options in Set [not chosen as "A"], which category of ATV would you most want to have? *(place a "B" in the data table)*

Questions about how strongly participant would consider picking other categories

5a. I understand that you would most want to have the ___ [category chosen as "A"] category of ATV of all the options on this chart.

But, please tell me, if you had **only** the options in Set ___ [chosen as "A"], using this scale, how strongly would you consider picking an ATV in the ___ category [ask about each category age-appropriate or older, except category chosen as "A"]? *(place number in data table)*

Definitely would not consider	Almost certainly would not consider	Probably would not consider	Might consider	Probably would consider	Almost certainly would consider	Definitely would consider
-------------------------------------	--	-----------------------------------	-------------------	-------------------------------	--	---------------------------------

--	--	--	--	--	--	--

1 2 3 4 5 6 7

6a. I understand that you would most want to have the ___ [category chosen as "B"] category of ATV of only the options in Set ___ [chosen as "B"].

But, please tell me, if you had **only** the options in Set ___ [chosen as "B"], using this scale, how strongly would you consider picking an ATV in ___ category [ask about each category age-appropriate or older, except category chosen as "B"]? *(place number in data table)*

(Go to page 6)

Questions to ask participants over 15 years old

I would like you to remember back to when you were 14, and answer these questions based on when you were 14 years old.

	Set A				Set B			
	Junior	Preteen	Teen	Adult	Y-6	Y-10	T	Adult
3b. – 6b.								

Questions about categories participant would most want to have

3b. Of all the options on this chart, which category ATV would you have most wanted to have at age 14? *(place an "A" in the data table)*

(Say once) Please keep in mind, we want to know your personal opinions and not what you think might be the most "correct" answer.

4b. Of only the options in Set [not chosen as "A"], which category ATV would you have most wanted to have at age 14? *(place a "B" in the data table)*

Questions about how strongly participant would consider picking other categories

5b. I understand that you would have most wanted to have the ___ [category chosen as "A"] category of ATV of all the options on this chart. But, please tell me, if you had **only** the options in Set ___ [chosen as "A"], using this scale, how strongly would you have considered picking an ATV in the ___ category [ask about each category age-appropriate or older, except category chosen as "A"]? *(place number in data table)*

Definitely would not consider	Almost certainly would not consider	Probably would not consider	Might consider	Probably would consider	Almost certainly would consider	Definitely would consider
-------------------------------------	--	-----------------------------------	-------------------	-------------------------------	--	---------------------------------

1	2	3	4	5	6	7

6b. I understand that you would have most wanted to have the ___ [category chosen as "B"] category of ATV of only the options in Set ___ [chosen as "B"]. But, please tell me, if you had **only** the options in Set ___ [chosen as "B"], using this scale, how strongly would you have considered picking an ATV in the ___ category [ask about each category age-appropriate or older, except category chosen as "B"]? *(place number in data table)*

(Go to next page)

Date: _____

Participant: _____

Location: _____

Condition: 1

Questions about alternate speeds for Teen model ATV

Now I would like to ask you some questions about ATV speeds.

(If participant is under age 9, go to question #7a)

(If participant is age 9-11, go to question #7b)

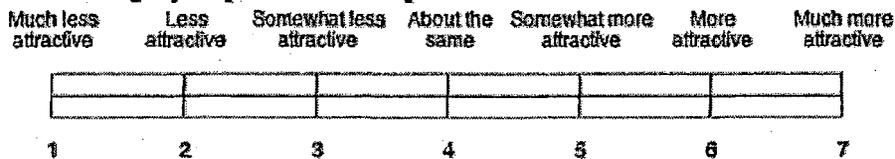
(If participant is age 12-15, go to question #7c)

(If participant is over age 15, go to question #7d)

Question to ask participants under age 9

Under **Set A**, the recommended ATV for someone your age is the **Junior** ATV, which has a top speed of **10 mph**.

7a. If the **Junior** category had a top speed of **15 mph in addition to 10 mph**, how would that affect your interest in having this category of ATV? Using this scale, would it make the **Junior** category... [read scale...]

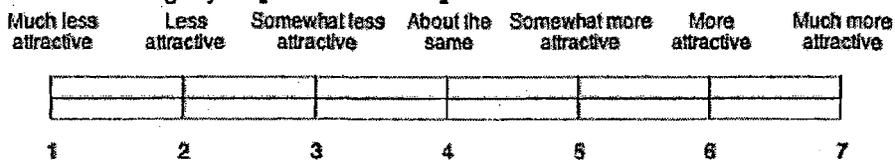


(Go to page 9)

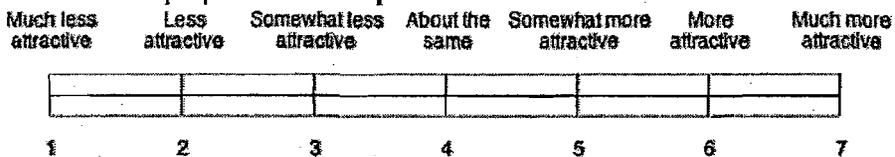
Questions to ask participants age 9-11

Under **Set A**, the recommended ATV for someone your age is the **Pre-Teen** ATV, which has a top speed of **15 mph**.

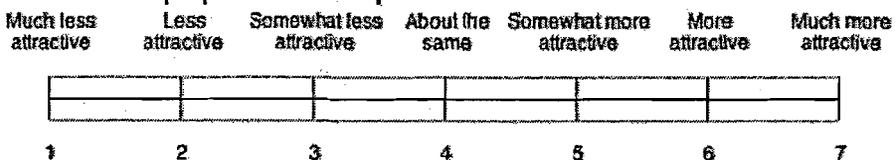
7b. If the **Pre-Teen** category had a top speed of **30 mph in addition to 15 mph**, how would that affect your interest in having this category of ATV? Using this scale, would it make the **Pre-Teen** category... [read scale...]



8b. How about for a top speed of **22 mph in addition to 15?**



9b. How about for a top speed of **38 mph in addition to 15?**



(Go to page 9)

Questions to ask participants age 12-15

Under **Set A**, the recommended ATV for someone your age is the **Teen ATV**, which has a top speed of **30 mph**.

7c. If the **Teen** category had a top speed of **38 mph in addition to 30 mph**, how would that affect your interest in having this category of ATV? Using this scale, would it make the **Teen** category... [read scale...]

Much less attractive	Less attractive	Somewhat less attractive	About the same	Somewhat more attractive	More attractive	Much more attractive
1	2	3	4	5	6	7

8c. How about for a top speed of **22 mph instead of 30?**

Much less attractive	Less attractive	Somewhat less attractive	About the same	Somewhat more attractive	More attractive	Much more attractive
1	2	3	4	5	6	7

9c. How about for a top speed of **45 mph in addition to 30?**

Much less attractive	Less attractive	Somewhat less attractive	About the same	Somewhat more attractive	More attractive	Much more attractive
1	2	3	4	5	6	7

10c. How about for a top speed of **15 mph instead of 30?**

Much less attractive	Less attractive	Somewhat less attractive	About the same	Somewhat more attractive	More attractive	Much more attractive
1	2	3	4	5	6	7

(Go to page 9)

Questions to ask participants over age 15

Please remember back to when you were 14 years old. Under **Set A**, the recommended ATV for someone of that age is the **Teen** ATV, which has a top speed of **30 mph**.

7d. If the **Teen** category had a top speed of **38 mph in addition to 30 mph**, how would that have affected your interest in having this category of ATV at age 14? Using this scale, would it have made the **Teen** category... [read scale...]

Much less attractive Less attractive Somewhat less attractive About the same Somewhat more attractive More attractive Much more attractive

--	--	--	--	--	--	--

1 2 3 4 5 6 7

8d. How about for a top speed of **22 mph instead of 30?**

Much less attractive Less attractive Somewhat less attractive About the same Somewhat more attractive More attractive Much more attractive

--	--	--	--	--	--	--

1 2 3 4 5 6 7

9d. How about for a top speed of **45 mph in addition to 30?**

Much less attractive Less attractive Somewhat less attractive About the same Somewhat more attractive More attractive Much more attractive

--	--	--	--	--	--	--

1 2 3 4 5 6 7

10d. How about for a top speed of **15 mph instead of 30?**

Much less attractive Less attractive Somewhat less attractive About the same Somewhat more attractive More attractive Much more attractive

--	--	--	--	--	--	--

1 2 3 4 5 6 7

(Go to next page)

Date: _____

Participant: _____

Location: _____

Condition: 1

PART 2: DEMOGRAPHIC INFO

*Has participant operated an ATV? (see response to question #2 on page 1)
(If yes, go to question #11a)
(If no, go to question #12)*

Question to ask participants who have operated an ATV

11a. How many times have you operated an ATV? *(circle one)*

Once

More than once, less than 10 times

10 to 20 times

More than 20 times

11b. In what state(s) have you operated an ATV? *(list all)*

11c. When was the last time you operated an ATV? *(circle one)*

Within the last week

Within the last month

Within the last year

Within the last few years

11d. Do you remember what kind of ATV it was?

Make _____

Model _____

Engine Size _____

11e. Does your family own any ATVs?

Yes No

Date: _____

Participant: _____

Location: _____

Condition: 1

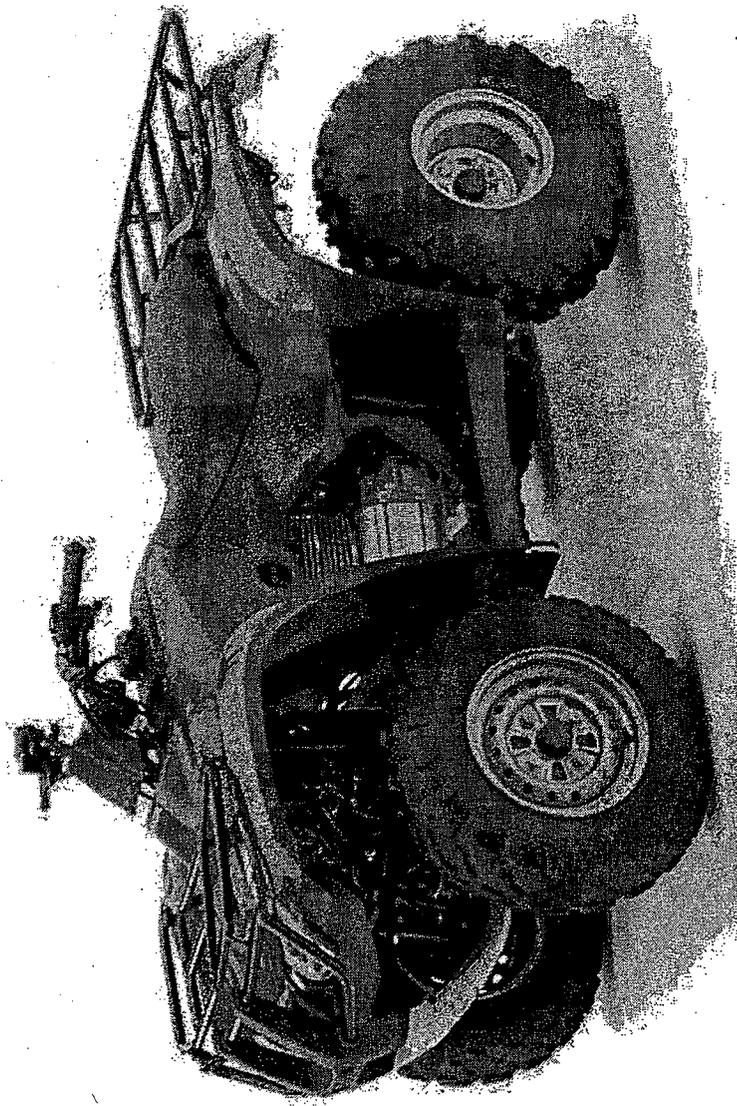
12. Other notes (where participant is from, context of use, etc.):

Please note participant's gender here:

Male Female

Thank you very much for your time today. I really appreciate your participation.

Appendix E: Study #2 (Youth) Pictures and Charts



Age	Set A	Set B	Age
6	Junior	Y-6 (Youth)	6
7			7
8			8
9	Pre-Teen	Y-10 (Youth)	9
10			10
11			11
12	Teen	T (Transitional)	12
13			13
14			14
15	Adult	Adult	15
16+			16+

Age		Set A	Set B	Age
6	6	Junior 10 mph	Y-6 (Youth) 10 mph 15 mph	6
7	7			7
8	8			8
9	9	Pre-Teen 10 mph 15 mph		9
10	10			10
11	11	Teen 15 mph 30 mph	Y-10 (Youth) 15 mph 30 mph	11
12	12			12
13	13			13
14	14	Adult No limit (up to 60-70 mph)	T (Transitional) 20, 30, 38 mph	14
15	15			15
16+	16+	Adult No limit (up to 60-70 mph)	Adult No limit (up to 60-70 mph)	16+

APPENDIX I



YAMAHA MOTOR CORPORATION, U.S.A.

6555 Katella Avenue • Cypress • California • 90630-5101 • (714) 761-7300 • Fax (714) 761-7303

ATV SAFETY ALERT

The Consumer Product Safety Commission has concluded that ALL-TERRAIN VEHICLES (ATVs) may present a risk of **DEATH or SEVERE INJURY** in certain circumstances. While accidents may occur for many reasons:

- *** Over 2,221 people, including many children, have died in accidents associated with ATVs since 1999.
- *** Many people have become severely paralyzed or suffered severe internal injuries as a result of accidents associated with ATVs.
- *** Every month thousands of people are treated in hospital emergency rooms for injuries received while riding an ATV.

You should be aware that **AN ATV IS NOT A TOY AND CAN BE HAZARDOUS TO OPERATE**. An ATV handles differently from other vehicles, including motorcycles and cars. A collision or rollover can occur quickly, even during routine maneuvers such as turning and driving on hills and over obstacles, if you fail to take proper precautions.

TO AVOID DEATH OR SEVERE PERSONAL INJURY:

- **ALWAYS** READ THE OWNER'S MANUAL CAREFULLY AND FOLLOW THE OPERATING PROCEDURES DESCRIBED. PAY SPECIAL ATTENTION TO THE WARNINGS CONTAINED IN THE MANUAL AND ON ALL LABELS.
- **NEVER** OPERATE AN ATV WITHOUT PROPER INSTRUCTION. **TAKE A TRAINING COURSE**. BEGINNERS SHOULD COMPLETE THE TRAINING COURSE DESCRIBED BELOW.
- **ALWAYS** FOLLOW THESE AGE RECOMMENDATIONS:
 - A CHILD UNDER 6 YEARS OLD SHOULD NEVER OPERATE AN ATV WITH ENGINE SIZE GREATER THAN 50 CC.
 - A CHILD UNDER 12 YEARS OLD SHOULD NEVER OPERATE AN ATV WITH ENGINE SIZE 70 CC OR GREATER.
 - A CHILD UNDER 16 YEARS OLD SHOULD NEVER OPERATE AN ATV WITH ENGINE SIZE GREATER THAN 90 CC.
- **NEVER** ALLOW A CHILD UNDER 16 YEARS OLD TO OPERATE AN ATV WITHOUT ADULT SUPERVISION. CHILDREN NEED TO BE OBSERVED CAREFULLY BECAUSE NOT ALL CHILDREN HAVE THE STRENGTH, SIZE, SKILLS OR JUDGEMENT NEEDED TO OPERATE AN ATV SAFELY.
- **NEVER** CARRY A PASSENGER ON AN ATV. CARRYING A PASSENGER MAY UPSET THE BALANCE OF THE ATV AND MAY CAUSE IT TO GO OUT OF CONTROL.
- **ALWAYS** AVOID PAVED SURFACES - PAVEMENT MAY SERIOUSLY AFFECT HANDLING AND CONTROL.
- **NEVER** OPERATE AN ATV ON A PUBLIC ROAD. EVEN A DIRT OR GRAVEL ONE, BECAUSE YOU MAY NOT BE ABLE TO AVOID COLLIDING WITH OTHER VEHICLES. ALSO, OPERATING AN ATV ON A PUBLIC ROAD MAY BE AGAINST THE LAW.
- **NEVER** OPERATE AN ATV WITHOUT AN APPROVED MOTORCYCLE HELMET, EYE PROTECTION, BOOTS, GLOVES, LONG PANTS AND A LONG-SLEEVED SHIRT OR JACKET.
- **NEVER** CONSUME ALCOHOL OR DRUGS BEFORE OR WHILE OPERATING AN ATV.
- **NEVER** OPERATE AN ATV AT EXCESSIVE SPEEDS. GO AT A SPEED WHICH IS PROPER FOR THE TERRAIN, VISIBILITY CONDITIONS AND YOUR EXPERIENCE.
- **NEVER** ATTEMPT TO DO WHEELIES, JUMPS OR OTHER STUNTS.
- **ALWAYS** BE CAREFUL WHEN OPERATING AN ATV, ESPECIALLY WHEN APPROACHING HILLS, TURNS, AND OBSTACLES AND WHEN OPERATING ON UNFAMILIAR OR ROUGH TERRAIN.
- **NEVER** LEND YOUR ATV TO ANYONE WHO HAS NOT TAKEN A TRAINING COURSE OR HAS NOT BEEN DRIVING AN ATV FOR AT LEAST A YEAR.

TRAINING COURSE

Anyone who purchases a new ATV, and everyone in the purchaser's immediate family who is within the recommended age group for the ATV purchased, is entitled to take a training course at no additional charge. Others can take the training for a small fee. A first-time purchaser of a new Yamaha ATV is also entitled to a rebate check from Yamaha when he, she, or a qualified family member completes the training course. The rebate is \$100 with the additional qualifying purchase of a Yamaha brand helmet, or \$75 without helmet purchase. Limit one rebate per ATV purchased. Ask an authorized dealer for details or call 1-800-887-2887 for training information.

FOR MORE INFORMATION ABOUT ATV SAFETY, CALL THE CONSUMER PRODUCT SAFETY COMMISSION AT 1-800-638-2772, OR THE ATV DISTRIBUTOR'S SAFETY HOTLINE AT 1-800-887-2887.



NEW PURCHASER ATV RIDER TRAINING CERTIFICATE

VIN #:
DEALER #:
SELLING DEALER #:
(IF DIFFERENT FROM ABOVE)

CERTIFICATE #:
NOMINAL CC SIZE:
MODEL #:

DATE OF PURCHASE
MO DAY YEAR

PURCHASER'S E-MAIL ADDRESS (OPTIONAL)

PURCHASER'S LAST NAME

FIRST NAME

MI

SEX (M/F)

ADDRESS

CITY

STATE

DAYTIME PHONE: () - -

ZIP CODE

DATE OF BIRTH
MO DAY YEAR

EVENING PHONE: () - -

PLEASE ANSWER THE FOLLOWING:

Is this your first ATV Purchase? (If "Yes," see Incentive information to right.)
 Yes No

Have you had previous ATV experience?
 Yes No

Type of Purchase (check one):
 Individual
 Business/Government

I and/or members of my immediate family would like to take advantage of the free training.
 Yes _____ (initial)
 No _____ (initial)

FIRST-TIME PURCHASER INCENTIVE

Yamaha will provide you, a first-time ATV purchaser, with a choice of the following incentives when you or any eligible member of your family completes the ATV training course through the ATV Safety Institute(ASI):

Send me a check for \$100.00!
 I am a first-time purchaser, and have completed the training offered. I have also purchased a DOT or SNELL approved helmet from my authorized Yamaha ATV dealer.

Selling Dealer confirmation of qualifying helmet purchase. Initial Here

Send me a check for \$75.00.
 I am a first-time purchaser, and have completed the training offered. I already own a suitable helmet.

NOTE: Allow 8-12 weeks after completion of the training for delivery. Business and government purchasers are not eligible for above incentives.

IMPORTANT SAFETY INFORMATION

We want to make sure you are aware of the following important information so that you can enjoy your new ATV safely. Please initial each warning as your dealer reviews it with you. Ask questions if you do not understand a particular warning. Remember, ATVs handle differently than other vehicles, including motorcycles and cars.

If you fail to follow these warnings and the warnings in the owner's manual and on the vehicle labels, you risk SEVERE OR EVEN FATAL INJURY.

I UNDERSTAND THAT A CHILD UNDER _____ SHOULD NOT OPERATE THIS ATV. THE DEALER HAS CLEARLY REPRESENTED TO ME THAT THIS ATV IS NOT APPROPRIATE FOR A CHILD UNDER _____.

_____ NEVER ATTEMPT TO DRIVE AN ATV UNTIL READING THE OWNER'S MANUAL.
 _____ NEVER DRIVE AN ATV AFTER CONSUMING ALCOHOL OR OTHER DRUGS.
 _____ NEVER DRIVE AN ATV WITHOUT WEARING A HELMET, EYE PROTECTION, AND PROTECTIVE CLOTHING.
 _____ NEVER DRIVE AN ATV AT EXCESSIVE SPEEDS.
 _____ NEVER CARRY A PASSENGER ON YOUR ATV.
 _____ NEVER DRIVE AN ATV ON A PUBLIC ROAD, EVEN A DIRT OR GRAVEL ONE.

I have read and understand the above warnings.

Purchaser's Signature: _____ Date: _____

I have explained the foregoing recommendations to the above-signed purchaser, and provided the above-signed purchaser with a signed copy of this form.

Dealer Representative Signature: _____ Date: _____

Yamaha would like to offer you a FREE ATV Rider Training Course to learn ATV riding skills or reinforce your current good riding skills. Your dealer will fill out this page for you and explain the financial incentive for first-time buyers to take training. Please take advantage of this free training program by calling toll-free 1-800-887-2887.

APPENDIX J



[REDACTED]

[REDACTED]

All-Terrain Vehicle 2001 Injury and Exposure Studies

[REDACTED]

[REDACTED]

January 2003

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Executive Summary

In 2001 the U.S. Consumer Product Safety Commission (CPSC) and members of the all-terrain vehicle (ATV) industry conducted studies of ATV-related injuries and exposure in order to help understand the reasons for the recent rise in ATV-related injuries. These studies provide information on the injuries and exposure in 2001 and can be compared to similar studies conducted in 1997.

From 1997 to 2001, the estimated number of ATV-related injuries treated in hospital emergency rooms rose from 54,700 to 111,700 (a 104% increase). In this time period, the estimated number of ATV drivers rose from 12 to 16.3 million (a 36% increase), the estimated total number of driving hours rose from 1575 to 2364 million (a 50% increase), and the estimated number of ATVs rose from 4 to 5.6 million (a 40% increase). None of these exposure measures accounts completely for the rise in injuries over the time period.

Riders, including drivers and passengers, under the age of 16 have comparable risk to riders 16 years and over as measured by injuries per rider. However, the risk is substantially larger for the younger group of riders as compared to the older group when measured by injuries per riding hour. When focus is on the driver's age, the risk to drivers under the age of 16 is greater than for the older drivers by both risk measures. Riders in both age groups have experienced notable percent increases in injuries and risk between 1997 and 2001. The 16 years and over riders accounted for a greater increase in injuries between 1997 and 2001, with corresponding increases in both exposure and risk.

ATVs come with a warning against carrying passengers. The risk to drivers is larger than that of passengers when measured by injuries per rider. However, the risk is larger for passengers than drivers when measured by injuries per riding hour.

Drivers with less than one year of driving experience have the highest risk among drivers of differing experience levels. This is particularly true when measured by injuries per driving hour, because drivers in this group tend to drive less than other drivers. The number of drivers with less than one year of driving experience has had a large percentage increase from 1997 to 2001 with a corresponding increase in injuries.

Drivers who drive less than 25 hours a year have substantially greater risk as measured by injuries per driving hour than drivers who drive more hours per year. There has been a large increase in the injuries to drivers with 200 or more driving hours a year. The increase corresponds to increases in the number of these drivers and the total number of driving hours for these drivers.

There has been a very large increase, both in absolute and percentage terms, of injuries associated with ATVs with engine sizes 400 cc or greater. This was accompanied by both a large increase in the number of these vehicles and a large increase in risk associated with these vehicles. However, the risk associated with these vehicles in 2001 was similar to that for ATVs with engine sizes from 200 to 399 cc.

Only a small percentage of ATV drivers in 2001 (7%) learned to operate an ATV through a dealer, salesman, or an organized training program. Significant percentages of the ATVs in 2001 were purchased used (44%). Among the used ATVs, 83% were purchased from a previous owner, as opposed to a dealer.

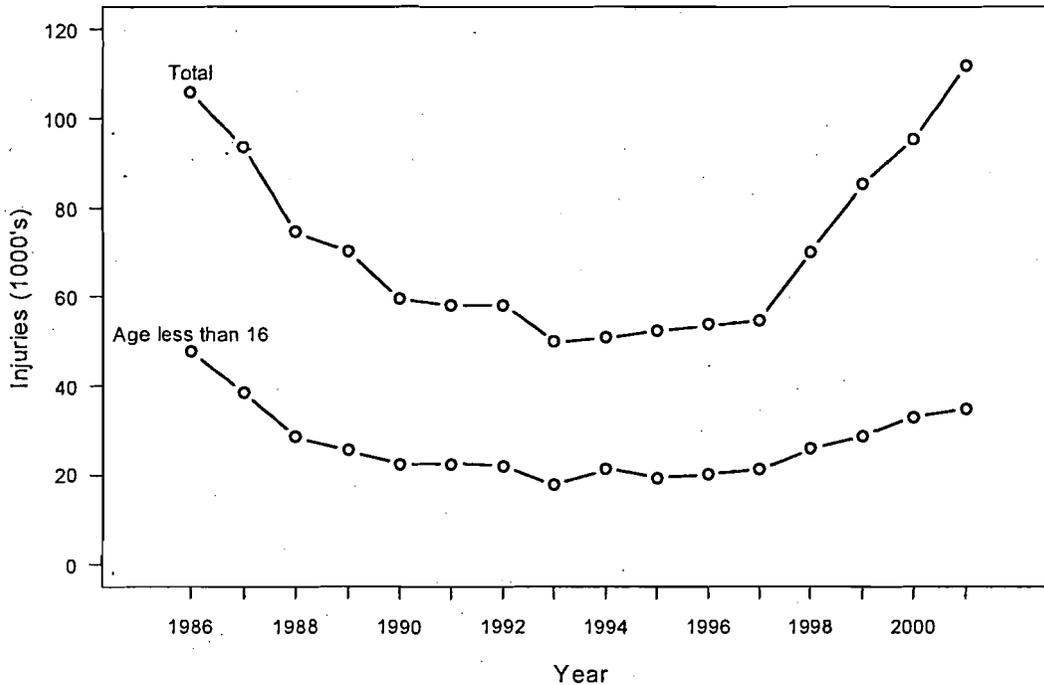
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1. Introduction

Since 1997 there has been a notable increase in injuries associated with all-terrain vehicles (ATVs) (Ingle 2002). In 1997 there were an estimated 54,700 injuries treated in hospital emergency rooms. In 2001 the number had risen by over 100% to 111,700. Figure 1 displays the trends in the estimated number of ATV-related injuries treated in hospital emergency rooms for the entire U.S. population and for children less than 16 years of age. The recent rise in total injuries from 1997 to 2001 is apparent. The rise in injuries to children is less pronounced.

Figure 1: U.S. Annual Estimates of Emergency Room-Treated ATV Injuries.



The U.S. Consumer Product Safety Commission (CPSC) continuously collects data on ATV injuries, which are summarized in annual reports (Ingle 2002). However, CPSC does not routinely obtain information on ATV usage or in-depth information on injuries. Increased usage, technically referred to as exposure, may result in an increase in injuries without changing common notions of risk. Prior to 2001, the most recent exposure and in-depth injury data came from CPSC studies conducted in 1997 (Kyle and Adler 1998, Rodgers 1998, Rodgers and Adler 1998).

In 2001 in order to help understand the reasons for the recent rise in ATV-related injuries, CPSC conducted an in-depth injury study and ATV-industry representatives conducted an exposure study. The two studies were designed in conjunction with one another and with parallel studies conducted in 1997. Taken together, there are now available in-depth

injury and exposure studies for both 1997 and 2001. Because these studies have been designed in conjunction with one another, it is possible to evaluate ATV risk for 1997 and 2001 and to compare risk between these two years.

The purpose of this report is to summarize the risks associated with ATVs for the years 1997 and 2001 and examine changes between 1997 and 2001. The report will consider the risks for various subgroups of interest and explore possible factors associated with increased risk. Additional pertinent findings from the injury and exposure studies will also be presented.

The reports on the 1997 studies (Kyle and Adler 1998, Rodgers 1998, Rodgers and Adler 1998) contain a review of previous CPSC ATV studies and some of the regulatory history. Briefly, CPSC conducted regulatory proceedings in the 1980s prompted by large numbers of ATV-related deaths and injuries. In the late 1980s ATV manufacturers entered into consent decrees with CPSC. Among other things, the consent decrees stopped the sale by dealers of three-wheel ATVs, placed engine size restrictions on sales intended for children, and implemented driver-training programs. The consent decrees expired in 1998. However, features of the consent decrees are still in place voluntarily by major manufacturers.

The remainder of this report is organized as follows. Section 2 reviews the data sources that are used in the report. Section 3 introduces the injury, exposure, and risk measures and presents the results for the U.S. as a whole. Section 4 presents the results for various subgroups. Section 5 discusses and summarizes the findings. Appendix 1 contains the specifics of the data sources and analyses. Appendix 2 contains some supplemental results. For information on ATV deaths, see the CPSC annual report (Ingle 2002).

2. Data Sources

This report makes use of four studies: the 1997 and 2001 CPSC injury studies and the 1997 and 2001 industry-sponsored exposure studies. The injury studies collected information to measure the size and characteristics of the injured population in the U.S. The information includes details on the injury incident, such as usage at the time of the incident and the characteristics of the ATV involved in the incident, and general information on the driver of the ATV, such as driver experience. The exposure studies collected information on the overall ATV vehicle, driver, and passenger populations in the U.S. to measure the sizes and characteristics of these populations. Comparisons of the injured population to the exposure population provide measures of risk. Additionally, comparisons can be made between various subgroups to identify groups with higher risk.

In 1997 CPSC conducted in-depth injury and exposure studies. CPSC staff designed the studies so that they could be used jointly to evaluate the risks associated with ATVs. In the same year industry sponsored its exposure study. The industry study was very similar to the CPSC exposure study in the form of the survey questionnaire, but differed in some notable ways. The CPSC study was based on a random-digit-dialing survey, in which U.S. households are randomly selected for surveying based on telephone numbers. The industry study used a market panel survey, in which a large pre-selected collection of

households is maintained for surveying. Also, the CPSC study was limited to households that owned at least one ATV. The industry study also included households that did not own an ATV, but contained members who rode ATVs. Finally, the CPSC study concentrated on ATV drivers, whereas the industry study also included detailed questions on ATV passengers.

In 2001 industry agreed to sponsor a new exposure study using the market panel approach. At that time, CPSC staff and industry representatives compared the 1997 CPSC and industry exposure studies. Both CPSC staff and the industry representatives agreed in discussions that the studies were comparable. CPSC staff and industry representatives then set about designing the 2001 injury and exposure studies. The studies very closely paralleled the 1997 counterparts. The notable differences between the 1997 and 2001 studies are the inclusion of additional questions to obtain hard to get information, changes in question wording for clarification, and the ordering of questions to improve responses to key questions.

CPSC staff has chosen to use the 1997 industry exposure study rather the 1997 CPSC exposure study to represent the 1997 exposure in this report. The choice produces the best comparability between the 1997 and 2001 exposure estimates.

Appendix 1 contains specifics on the four studies and the methodology of the calculations of the summary measures presented in this report. The appendix includes important information on defining the scope of the analysis and adjusting for seasonal differences and survey non-response.

3. Injury, Exposure, and Risk Measures for the U.S.

Injury, Exposure, and Risk Measures

The injury measure used in this report is the number of hospital emergency room-treated injuries associated with the non-occupational use of ATVs. Except when noted, injuries to drivers, passengers, or non-riders, such as bystanders, are included. Appendix 1 contains additional details on the scope of the injuries included.

There are five basic exposure measures used in this report. Each exposure measure emphasizes different aspects of exposure. To present these measures, it is necessary to distinguish between drivers and passengers. *ATV riders* are made up of *drivers* and *passengers*. A *driver* is a rider who operated an ATV at least once in the last year. A driver may also ride at times as a non-operator. A *passenger* is a rider who has not operated an ATV in the last year. The measure *Driving Hours* refers to the amount of time ATVs are driven. The measure *Riding Hours* is made up of driving hours multiplied by the number of riders exposed. For example, if an ATV is driven for one hour with a driver and a passenger, then the contribution to driving hours is one hour and the contribution to riding hours is two hours.

The five basic exposure measures used are the number of ATV drivers, the number of ATV riders, the annual driving hours, the annual riding hours, and the number of ATVs.

Drivers and riders include all those riders in the U.S. who rode an ATV in the year prior to the exposure survey. Driving and riding hours include the total numbers of driving and riding hours in the U.S. in the year prior to the exposure survey. Because of the difficulty of obtaining reliable separate estimates of non-occupational and occupational driving and riding hours, these measures include both non-occupational and occupational use. The number of ATVs includes only those that are owned by households and are in operating order.

Five risk measures are derived from the injury measure divided by each of the exposure measures. The five measures are *injuries per driver*, *injuries per rider*, *injuries per driving hour*, *injuries per riding hour*, and *injuries per ATV*. Because of the magnitudes of the measures, they are expressed in the tables as *injuries per thousand drivers*, *injuries per thousand riders*, *injuries per million driving hours*, *injuries per million riding hours*, and *injuries per thousand ATVs*.

U.S. Total

Table 1 gives the injury, exposure, and risk measures for 1997 and 2001 for the U.S. Included in the table are the percent increases of the measures between the two years. From 1997 to 2001, the number of ATV-related injuries had risen from 54,700 to 111,700, representing an increase of 104%. The largest increase among the exposure measures was for driving hours, which increased by 50%. The fact that driving hours increased faster than the number of drivers indicates that drivers on the average drove more hours in 2001 than in 1997. The same pattern exists for riders and riding hours. Likewise, the exposure measures indicate that ATVs were on the average driven and ridden more hours in 2001 than in 1997.

Injuries have increased at a greater rate than any of the five exposure measures. This disparity between the increase in injuries and exposure is reflected in the risk measures, which show that risk has increased anywhere from 36% to 62% depending on the risk measure.

Table 1: U.S. ATV Injury, Exposure and Risk Estimates.

	Year		% Increase
	1997	2001	
Injuries	54,700	111,700	104.2%
Exposure Measures			
Drivers (Million)	12.0	16.3	35.5%
Riders (Million)	18.1	22.9	26.4%
Driving Hours (Million)	1,575	2,364	50.1%
Riding Hours (Million)	1,801	2,608	44.8%
ATVs (Million)	4.0	5.6	39.5%
Risk Measures			
Injuries / Thousand Drivers	4.5	6.8	50.7%
Injuries / Thousand Riders	3.0	4.9	61.6%
Injuries / Million Driving Hours	34.7	47.3	36.1%
Injuries / Million Riding Hours	30.4	42.8	41.0%
Injuries / Thousand ATVs	13.7	20.0	46.4%

Note: The risk and percent increase values are calculated from the injury and exposure measures based on values with greater precision than the values presented in the table.

4. Subgroup Analyses

This section presents subgroup analyses of the injury, exposure, and risk measures, as well as some information on driver training and the ATV market. The subgroups fall into four classes: rider characteristics, driver characteristics, ATV characteristics, and joint characteristics. It is important to note that an injured person may be a driver, a passenger, or a non-rider. For example, consider an incident where a 25-year-old person is injured as a passenger on an ATV that was driven by a 15-year-old person. For the rider characteristics, the incident would be classified as an over-16-year-old-rider incident. However, for the driver characteristics, it would be classified as an under-16-year-old-driver incident.

The analysis of subgroups based on the rider characteristics addresses overall risk to a group of interest, such as the risk to children under the age of 16, whether or not they are drivers, passengers, or non-riders. However, the driver characteristics are likely more related to ATV risk than the rider characteristics, since it is the driver who controls the ATV. If the injured person was the driver then the driver and rider characteristics are the same for the incident.

The joint characteristic analyses consider two characteristics simultaneously, such as the ATV engine size and the driver age. The joint analysis permits, to some degree, the separation of the effects of the two characteristics and the identification of interaction between two characteristics.

For each subgroup, the injury, exposure, and risk measures are given for the years 1997 and 2001. Considering each year separately, the risk measures can be used to identify groups with higher risk. Additionally, the percent changes in the measures between the two years are given. The percent changes highlight groups with large changes in injuries, exposure, or risk. The identification of such changes helps to explain the observed increase in injuries. For example, an increase in injuries can be associated with an increase in exposure, an increase in risk, or a combination of the two.

Rider Characteristics

This section explores the risk associated with subgroups based on the rider characteristics: the age, gender, and riding position (driver versus passenger) of the rider. For these measures, only injuries to riders are included, because exposure measures do not exist for non-riders. The number of injuries to non-riders is small, representing 1% and 2% of the estimated injuries in 1997 and 2001 respectively.

Rider Age

Table 2 gives the injury, exposure, and risk measures for the rider age groups *under 16* and *16 and over*. The two subgroups do not differ much from each other in the *injuries per rider* measure. However, the *injuries per riding hour* measure is higher for the *under 16* age group, indicating that for each riding hour the *under 16* age group is more likely to be injured than the *16 and over* age group.

Comparing 1997 and 2001, the *16 and over* age group has undergone a more substantial percent increase in the number of injuries. Similarly, this age group has experienced a larger percent increase in the exposure and risk measures. However, the *under 16* age group has experienced notable percent increases in injuries and *injuries per rider*.

Appendix 2 contains a more detailed age breakdown analysis than is presented here. From that analysis, the large increases in injuries and risk for the *16 and over* age group are seen over a wide range of rider ages for this group. Noteworthy, riders ages 12 to 15 have also experienced large percent increases in injuries and risk.

Table 2: U.S. ATV Injury, Exposure and Risk Estimates by Rider Age.

	Year				% Increase	
	1997		2001			
	Age (Years)		Age (Years)		Age (Years)	
	< 16	≥ 16	< 16	≥ 16	< 16	≥ 16
Injuries	21,132	32,882	33,071	76,059	56.5%	131.3%
Exposure Measures						
Riders (Million)	6.6	11.5	7.2	15.7	9.1%	36.2%
Riding Hours (Million)	428	1,373	575	2,033	34.2%	48.1%
Risk Measures						
Injuries / Thousand Riders	3.2	2.9	4.6	4.8	43.4%	69.8%
Injuries / Million Riding Hours	49.4	24.0	57.6	37.4	16.6%	56.2%

Notes: Injuries do not include injuries to non-riders and do not sum to the totals on Table 1. The risk and percent increase values are calculated from the injury and exposure measures based on values with greater precision than the values presented in the table.

Rider Gender

Table 3 gives the injury, exposure, and risk measures for female and male riders. By both risk measures, *injuries per rider* and *injuries per riding hour*, males have a much greater risk than females. Comparing 1997 and 2001, males have experienced a greater percent increase in injuries and risk by both measures than females. However, females have had a greater percent increase in exposure by both measures.

Table 3: U.S. ATV Injury, Exposure and Risk Estimates by Rider Gender.

	Year				% Increase	
	1997		2001			
	Female	Male	Female	Male	Female	Male
Injuries	13,934	40,079	22,832	86,298	63.9%	115.3%
Exposure Measures						
Riders (Million)	7.1	11.0	9.4	13.5	33.0%	22.1%
Riding Hours (Million)	511	1,290	761	1,846	49.0%	43.1%
Risk Measures						
Injuries / Thousand Riders	2.0	3.6	2.4	6.4	23.2%	76.3%
Injuries / Million Riding Hours	27.3	31.1	30.0	46.7	9.9%	50.4%

Note: Injuries do not include injuries to non-riders and do not sum to the totals on Table 1. The risk and percent increase values are calculated from the injury and exposure measures based on values with greater precision than the values presented in the table.

Rider Position

Table 4 gives the injury, exposure, and risk measures for the drivers and passengers. ATVs come with a warning against carrying passengers. The number of riding hours by drivers is overwhelmingly larger than that of passengers. However, in terms of number of riders, the difference is not as large. The risk to drivers is larger than that of passengers when measured by *injuries per rider*. However, the risk is larger for passengers than drivers when measured by *injuries per riding hour*. Comparing 1997 and 2001, drivers have experienced the larger percent increase in injuries, exposure by both measures, and risk by both risk measures. However, passengers have experienced notable percent increases in injuries and *injuries per rider*.

Table 4: U.S. ATV Injury, Exposure and Risk Estimates by Rider Position.

	Year				% Increase	
	1997		2001			
	Driver	Passenger	Driver	Passenger	Driver	Passenger
Injuries	41,547	12,467	89,589	19,541	115.6%	56.7%
Exposure Measures						
Riders (Million)	12.0	6.1	16.3	6.6	35.5%	8.1%
Riding Hours (Million)	1,575	200	2,364	290	50.1%	44.6%
Risk Measures						
Injuries / Thousand Riders	3.5	2.1	5.5	3.0	59.1%	45.0%
Injuries / Million Riding Hours	26.4	62.2	37.9	67.4	43.7%	8.4%

Notes: Injuries do not include injuries to non-riders and do not sum to the totals on Table 1. Because of incomplete reporting, the riding hours do not sum to those in Table 1 (see Appendix 1). The risk and percent increase values are calculated from the injury and exposure measures based on values with greater precision than the values presented in the table.

Driver Characteristics

This section explores the risk associated with subgroups based on the driver characteristics: the age, gender, driving experience, annual driving hours, and recreational use. In this section, injuries include non-rider injuries in addition to those of riders, because the purpose is to associate overall injuries to the driver characteristics.

Driver Age

Table 5 gives the injury, exposure, and risk measures for the driver age groups *under 16* and *16 and over*. The risk for the *under 16* age group is higher than that of the *16 and over* group as measured by either *injuries per driver* or *injuries per driving hour*. Interestingly, when considering the rider age subgroups in Table 2, the *injuries per rider* did not differ much between the two age groups. When focus is given to the driver age, the difference is larger.

Comparing 1997 to 2001, the *16 and over* age group had much larger percent increases in the number of injuries, exposure by both measures, and risk by both risk measures. However, the *under 16* age group has experienced notable percent increases in injuries and risk.

Appendix 2 contains a more detailed age breakdown analysis than is presented here. From that analysis, the large increases in injuries and risk for the *16 and over* age group were seen over a wide range of driver ages for this group. Noteworthy, drivers ages 12 to 15 have also experienced large percent increases in injuries and risk.

Table 5: U.S. ATV Injury, Exposure and Risk Estimates by Driver Age.

	Year				% Increase	
	1997		2001			
	Age (Years)		Age (Years)		Age (Years)	
	< 16	≥ 16	< 16	≥ 16	< 16	≥ 16
Injuries	18,454	36,246	29,013	82,687	57.2%	128.1%
Exposure Measures						
Drivers (Million)	2.5	9.5	2.8	13.5	13.0%	41.5%
Driving Hours (Million)	344	1,231	411	1,953	19.3%	58.6%
Risk Measures						
Injuries / Thousand Drivers	7.3	3.8	10.2	6.1	39.1%	61.2%
Injuries / Million Driving Hours	53.6	29.5	70.6	42.3	31.7%	43.8%

Note: The risk and percent increase values are calculated from the injury and exposure measures based on values with greater precision than the values presented in the table.

Driver Gender

Table 6 gives the injury, exposure, and risk measures for the female and male drivers. By both risk measures, *injuries per rider* and *injuries per riding hour*, males have a greater risk than females. Comparing 1997 and 2001, males have experienced a substantially greater percent increase in injuries and risk by both measures as compared to females. In fact, the risk for females decreased by both risk measures. However, females have experienced a greater percent increase in exposure by both measures.

Table 6: U.S. ATV Injury, Exposure and Risk Estimates by Driver Gender.

	Year				% Increase	
	1997		2001			
	Female	Male	Female	Male	Female	Male
Injuries	11,033	43,667	15,740	95,960	42.7%	119.8%
Exposure Measures						
Drivers (Million)	3.6	8.5	5.5	10.8	55.4%	27.2%
Driving Hours (Million)	414	1,161	632	1,732	52.8%	49.1%
Risk Measures						
Injuries / Thousand Drivers	3.1	5.1	2.8	8.9	-8.2%	72.7%
Injuries / Million Driving Hours	26.7	37.6	24.9	55.4	-6.6%	47.4%

Note: The risk and percent increase values are calculated from the injury and exposure measures based on values with greater precision than the values presented in the table.

Driver Experience

Table 7 gives the injury, exposure, and risk measures by the number of years of experience driving ATVs of the driver. The least experienced drivers, those with less than 1 year of driving experience, have considerably higher risk, as measured by either *injuries per driver* or *injuries per driving hour*. This is particularly true for the *injuries per driving hour*, because this group drives many fewer hours per driver than the other groups.

The least experienced group also had the highest percent increase in the number of drivers from 1997 to 2001. The large increase in the riskiest group corresponds to a large percent increase in injuries.

The most experienced group, those with 10 or more years of experience, exhibited a large percent increase in risk by both measures. Since this is a large group, there is a corresponding large absolute increase in injuries.

Table 7: U.S. ATV Injury, Exposure and Risk Estimates by Driver Experience.

		Experience (Years)			
		< 1	1 to < 5	5 to < 10	≥ 10
Injuries					
	1997	10,137	17,951	8,518	18,094
	2001	20,584	28,588	18,360	44,168
	% Increase	103.1%	59.3%	115.5%	144.1%
Exposure Measures					
Drivers (Million)					
	1997	1.0	4.1	2.4	4.5
	2001	1.7	5.8	2.5	6.3
	% Increase	73.8%	40.0%	2.9%	40.4%
Driving Hours (Million)					
	1997	31	553	289	708
	2001	69	785	505	1,039
	% Increase	127.2%	42.0%	74.6%	46.8%
Risk Measures					
Injuries / Thousand Drivers					
	1997	10.2	4.3	3.5	4.0
	2001	11.9	4.9	7.4	7.0
	% Increase	16.9%	13.8%	109.4%	73.8%
Injuries / Million Driving Hours					
	1997	331.9	32.5	29.5	25.6
	2001	296.6	36.4	36.4	42.5
	% Increase	-10.6%	12.2%	23.4%	66.3%

Notes: Because of incomplete reporting, the driving hours do not sum to those in Table 1 (see Appendix 1). The risk and percent increase values are calculated from the injury and exposure measures based on values with greater precision than the values presented in the table.

Driving Hours

Table 8 gives the injury, exposure, and risk measures by the annual driving hours of the driver. By the *injuries per driver* risk measure, the drivers with 200 or more annual driving hours have the greater risk. However, when considering the *injuries per driving hour* risk measure, these drivers have the lowest risk and drivers with less than 25 annual driving hours have overwhelmingly the greatest risk.

Comparing 1997 and 2001, there has been a large percent increase in the number of drivers with less than 25 hours of annual driving, resulting in a large absolute increase in

the number of injuries. Drivers with 200 or more driving hours have also experienced a large absolute increase in injuries, corresponding to a large percent increase in the number of drivers and an even larger percent increase in the number of driving hours.

Table 8: U.S. ATV Injury, Exposure and Risk Estimates by Driver Annual Driving Hours.

		Hours			
		< 25	25 to < 50	50 to <200	≥ 200
Injuries	1997	12,246	5,686	16,097	20,671
	2001	28,338	8,904	31,229	43,229
	% Increase	131.4%	56.6%	94.0%	109.1%
Exposure Measures					
Drivers (Million)	1997	5.4	1.9	2.8	1.9
	2001	8.4	1.7	3.4	2.9
	% Increase	53.8%	-12.2%	23.1%	48.5%
Driving Hours (Million)	1997	49	70	302	1,154
	2001	69	61	355	1,879
	% Increase	40.0%	-12.6%	17.5%	62.8%
Risk Measures					
Injuries / Thousand Drivers	1997	2.3	3.0	5.8	10.6
	2001	3.4	5.4	9.1	15.0
	% Increase	50.5%	78.3%	57.6%	40.8%
Injuries / Million Driving Hours	1997	247.9	81.5	53.3	17.9
	2001	409.6	145.9	88.1	23.0
	% Increase	65.2%	79.1%	65.1%	28.5%

Note: The risk and percent increase values are calculated from the injury and exposure measures based on values with greater precision than the values presented in the table.

Recreational Use

Table 9 gives the injury, exposure, and risk measures by recreational use of the ATV. Examples of non-recreational use include household chores and transportation. The injuries are classified into whether the associated ATV was being used for recreation at the time of the incident. The only available exposure measures are the estimated driving hours for recreational and non-recreational use in 2001.

In 2001 recreational use of ATVs is associated with much higher risk than non-recreational use. There has been a large increase in non-recreational injuries from 1997 to 2001, but there is no parallel exposure information to judge changes in risk.

Table 9: U.S. ATV Injury, Exposure and Risk Estimates by Recreational Use.

	Year				% Increase	
	1997		2001			
	Recreational Use		Recreational Use		Recreational Use	
	Yes	No	Yes	No	Yes	No
Injuries	52,944	1,756	107,274	4,426	102.6%	152.1%
Exposure Measures						
Driving Hours (Million)	NA	NA	1,505	859	NA	NA
Risk Measures						
Injuries / Million Driving Hours	NA	NA	71.3	5.2	NA	NA

Notes: NA=Not available. The risk and percent increase values are calculated from the injury and exposure measures based on values with greater precision than the values presented in the table.

ATV Characteristics

This section explores the risk associated with subgroups based on ATV characteristics: the engine size and the number of wheels. In this section, injuries include non-rider injuries in addition to riders, because the purpose is to associate overall injuries to the vehicle characteristics.

Engine Size

Table 10 gives the injury, exposure, and risk measures by the engine size of the ATV. The number of ATVs is the only available exposure measure. Because the driving hour exposure measure is not available, the engine size results may be confounded by any association between driving hours and engine size.

There has been a large increase in absolute terms and an exceptionally large increase in percent terms in the number of injuries associated with ATVs with engine sizes of 400 cc or more. This is associated with corresponding large percent increases in the number of ATVs and the risk associated with this class of ATVs. However, the risk for these ATVs in 2001 is comparable to those in the 200 to 299 cc and 300 to 399 cc engine size classes. The 200 to 299 cc engine class has also experienced a large percent increase in risk.

Table 10: U.S. ATV Injury, Exposure and Risk Estimates by Engine Size.

		Engine Size (cc)				
		≤90	91 to 199	200 to 299	300 to 399	≥400
Injuries	1997	3,316	7,450	22,317	17,955	3,662
	2001	4,437	6,779	44,577	31,470	24,437
	% Increase	33.8%	-9.0%	99.7%	75.3%	567.2%
Exposure Measure						
ATVs (Million)	1997	0.3	0.6	1.8	1.0	0.4
	2001	0.4	0.5	1.9	1.7	1.1
	% Increase	32.0%	-16.1%	5.2%	77.7%	202.7%
Risk Measure						
Injuries / Thousand ATVs	1997	12.0	12.7	12.3	18.6	10.0
	2001	12.2	13.8	23.5	18.3	22.0
	% Increase	1.4%	8.5%	90.0%	-1.3%	120.4%

Note: The risk and percent increase values are calculated from the injury and exposure measures based on values with greater precision than the values presented in the table.

Number of Wheels

Table 11 gives the injury, exposure, and risk measures by the number of wheels of the ATV. Three-wheel ATVs have not been manufactured since the consent decrees in 1988. The number of three-wheel ATVs and number of driving hours on three-wheel ATVs have decreased from 1997 to 2001.

Past studies have demonstrated the larger risk of three-wheel ATVs versus four-wheel ATVs (Rodgers and Adler 1998). In 2001 the risk associated with three-wheel ATVs was somewhat lower than that of four-wheel ATVs. The analysis does not imply that three-wheel ATVs are inherently safer than four-wheel ATVs. The risk measure used in this report is an empirical measure of the rate of injuries. The relatively small remaining population of three-wheel ATVs may be associated with other factors that account for the lower risk of these ATVs. For example, the three-wheel ATVs were manufactured when engine sizes were generally smaller than they are on today's four-wheel models. The drivers and use patterns of these remaining ATVs may be different from those of the four-wheel ATVs. The ability to separate the effects of various driver and vehicle characteristics is discussed in Section 5.

Table 11: U.S. ATV Injury, Exposure and Risk ATV Estimates by Number of Wheels.

	Year				% Increase	
	1997		2001			
	Four	Three	Four	Three	Four	Three
Injuries	39,710	14,990	100,943	10,757	154.2%	-28.2%
Exposure Measures						
Driving Hours (Million)	1,232	344	2,049	276	66.4%	-19.7%
ATVs (Million)	2.8	1.2	4.8	0.8	75.4%	-39.6%
Risk Measures						
Injuries / Million Driving Hours	32.2	43.6	49.3	38.9	52.8%	-10.6%
Injuries / Thousand ATVs	14.4	12.0	20.9	14.3	44.9%	18.8%

Notes: Because of incomplete reporting, the driving hours do not sum to those in Table 1 (see Appendix 1). The risk and percent increase values are calculated from the injury and exposure measures based on values with greater precision than the values presented in the table.

Joint Characteristics

The previous analyses address one characteristic at a time to identify relationships between injuries, exposure, and risk. Such analyses are known as univariate analyses. This section contains two bivariate analyses that address two characteristics at a time. These joint characteristic analyses allow, to some degree, the separation of the individual effects of the two characteristics. Also, they permit the identification of combinations of the characteristics that result in unique effects, known as interactions.

The two joint analyses provide the injury, exposure, and risk measures for combinations of (1) the driver age and the ATV engine size and (2) the driver experience and the ATV engine size. These joint analyses have additional limitations over the univariate analyses. Because drivers may ride more than one ATV, it is difficult to derive exposure measures for combinations of driver and ATV characteristics. This is not a problem for the injury measure, since the characteristics of the driver and ATV associated with the injury are fixed. From the exposure studies, it is only possible to associate drivers and ATVs for households that own an ATV. As explained in Appendix 1, in most cases, it is not possible to determine how much the driver uses the particular ATV. For these reasons, the results in this section should be interpreted with caution.

Because joint characteristic analyses result in more subgroups than the univariate analyses, the numbers of subgroups per characteristic are reduced from those of the univariate analyses. For simplicity, only the year 2001 is considered.

Driver Age and ATV Engine Size

Table 12 gives the injury, exposure, and risk measures for combinations of the driver age and the ATV engine size for households that own an ATV. By the consent decrees, manufacturers established the recommendation of engine sizes 90 cc or less for drivers under the age of 16.

In 2001 the large majority of injuries associated with drivers under the age of 16 occurred with ATVs larger than recommended for the age group. By both measures of risk, these drivers were at greater risk than those who use ATVs with recommended engine sizes. However, the risk for the drivers 16 and over versus engine size followed a similar pattern.

Table 12: U.S. ATV Injury, Exposure and Risk Estimates by Driver Age and Engine Size of Owning Households for 2001.

	Age (Years)	Engine Size (cc)		
		≤90	91 to 199	≥200
Injuries	< 16	3,429	2,998	19,770
	≥ 16	739	2,822	61,544
Exposure Measure				
Drivers (Million)	< 16	0.2	0.1	1.0
	≥ 16	0.2	0.5	6.5
Driving Hours (Million)	< 16	38	24	181
	≥ 16	40	52	1,220
Risk Measure				
Injuries / Thousand Drivers	< 16	14.4	22.4	20.2
	≥ 16	3.2	5.5	9.5
Injuries / Million Driving Hours	< 16	90.1	123.7	109.5
	≥ 16	18.5	54.5	50.5

Note: The risk and percent increase values are calculated from the injury and exposure measures based on values with greater precision than the values presented in the table.

Driver Experience and ATV Engine Size

Table 13 gives the injury, exposure, and risk measures for combinations of driver experience and ATV engine size for households that own an ATV. The results are similar to those from the univariate analyses of driver experience and ATV engine size. Drivers with less experience have greater risk by both measures for each of the engine size classes. This is particularly true for the *injuries per driving hour* measure.

Table 13: U.S. ATV Injury, Exposure and Risk Estimates by Driver Experience and Engine Size of Owning Households for 2001.

	Driver Experience (Years)	Engine Size (cc)			
		≤199	200 to 299	300 to 399	≥400
Injuries	< 1	1,777	6,560	4,694	2,724
	1 to < 5	3,544	8,349	5,198	4,666
	≥ 5	4,863	17,972	17,570	13,215
Exposure Measure					
Drivers (Million)	< 1	0.1	0.1	0.2	0.1
	1 to < 5	0.3	0.8	1.0	0.6
	≥ 5	0.7	2.0	1.7	1.1
Driving Hours (Million)	< 1	9	11	7	6
	1 to < 5	44	109	152	115
	≥ 5	102	401	348	260
Risk Measure					
Injuries / Thousand Drivers	< 1	20.4	44.2	23.0	33.3
	1 to < 5	12.7	10.8	5.4	8.1
	≥ 5	6.5	9.0	10.5	12.4
Injuries / Million Driving Hours	< 1	198.3	574.6	629.9	428.4
	1 to < 5	81.4	76.3	34.2	40.6
	≥ 5	47.4	44.9	50.4	50.8

Note: The risk and percent increase values are calculated from the injury and exposure measures based on values with greater precision than the values presented in the table.

Driver Training and ATV Market Information

This section provides additional information on the driver and ATV population in 2001 derived from the exposure study.

Driver Training

Table 14 presents the number of drivers in 2001 by how they learned to operate an ATV. These drivers include all drivers who operated an ATV in the year previous to the survey. A large majority of drivers stated they learned from a friend, relative or themselves. A small percentage of drivers (7%) stated they learned from an organized training program, dealer, or salesman.

Table 14: Number of Drivers by How They Learned to Operate an ATV for 2001.

	Organized Program, Dealer, Salesman	Friend, Relative, Self	Other
Drivers (Million)	1.1	14.6	1.2

Note: Multiple responses were permitted.

ATV Market

Table 15 presents some market characteristics of the ATV population in 2001. This population includes all ATVs owned by households that were in operating condition the year previous to the survey. Among the population of ATVs in 2001, significant percentages were purchased used (44%). Among the used ATVs, 83% were purchased from a previous owner, as opposed to a dealer. The overwhelming majority (99%) of the ATVs in 2001 were of manufacturers that have voluntarily agreed to abide by the major aspects of the consent decrees.

Table 15: ATV Market Characteristics for 2001.

	ATVs (Million)
Purchased New	3.1
Purchased Used	2.5
Purchased from Dealer	3.5
Purchased from Previous Owner	2.0
Voluntary Consent Manufacturer	5.5
Other Manufacturer	0.1

5. Discussion

The comparison between 1997 and 2001 of injury, exposure, and risk estimates for the U.S. reveals that ATV risk according to multiple measures has increased between these two years. This increase in risk has occurred for both riders under the age of 16 and riders 16 years and older and for both drivers and passengers. The riders 16 years and over have experienced larger percent increases in injuries, exposure, and risk than the under the age of 16 riders. However, riders under the age of 16 continue to be associated with greater risk than older riders when measured by injuries per riding hour.

Examining the injury, exposure, and risk measures for each of various subgroups based on driver and vehicle characteristics highlights characteristics associated with higher risk. Comparing these measures between the two years, 1997 and 2001, highlights subgroups associated with large changes in injuries, exposure, or risk. Injuries may increase for a subgroup because of increased exposure, increased risk, or both.

Drivers under the age of 16 are associated with greater risk than the older drivers. Both drivers under the age of 16 and drivers 16 years and older have experienced notable percent increases in injuries and risk between 1997 and 2001. However, the drivers 16 years and over are responsible for the greater increase in injuries both because of increased exposure and increased risk.

There has been a large percent increase in the number of drivers with less than 1 year of driving experience. These drivers have the highest risk associated with them and therefore, there has been a disproportionate increase in injuries for these drivers.

Drivers who drive less than 25 hours a year have substantially greater risk as measured by injuries per driving hour than drivers who drive more hours per year. There has been a large increase in the injuries to drivers with 200 or more driving hours a year. The increase corresponds to increases in the number of these drivers and the total number of driving hours for these drivers.

For ATVs with engine sizes 400 cc or greater, there have been large increases in the number of vehicles and the risk between 1997 and 2001. Correspondingly, there have been a large absolute increase and an exceptionally large percent increase in the number of injuries associated with these vehicles. However, the risk for these ATVs in 2001 was comparable to that for ATVs with engine sizes from 200 to 399 cc.

As discussed in the analyses sections, there may be relationships among the characteristics of the drivers and ATVs, such as driver age, driver experience, engine size, and use. For example, the driver and use patterns of three-wheel ATVs may be different from those of four-wheel ATVs. Because of such relationships, associations between characteristics and injury, exposure, and risk measures are only indicative and not conclusive.

Appendix 1: Study Details

Injury Studies

The 1997 and 2001 CPSC injury studies are based on the CPSC National Electronic Injury Surveillance System (NEISS) (Schroeder and Ault 2001). NEISS uses a stratified probability sample of hospitals with emergency rooms with 6 or more beds in the United States and its territories. Information from each consumer product related injury case in these hospitals is entered into NEISS. From the statistical design of NEISS, it is possible to make national estimates of injuries related to individual consumer products. These injury estimates reflect only those injuries that resulted in an emergency room visit.

For detailed information associated with particular consumer products, CPSC conducts special studies, which consist of follow-up survey efforts of NEISS cases. For special studies, CPSC relies on the NEISS hospitals to provide contact information on the injured people. CPSC maintains the contact information only until the survey process is complete. Some of the NEISS hospitals do not provide contact information to CPSC, and it is generally not possible to obtain survey information for cases from these hospitals.

For both the 1997 and 2001 injury studies, each ATV-related NEISS case during the study periods was assigned for surveying. The completed surveys were examined to determine if they were in the scope of the study. For a case to be in scope the following criteria must be met:

- The case must involve an ATV.
- The ATV must have been operating at the time of incident. (This includes the ATV being started, stopped, and in motion, but excludes incidents related to transporting or repairing the ATV.)
- The case must involve a non-occupational use of the ATV.
- There was no deliberate or otherwise external cause of the injury.

The surveys included questions to verify the vehicle was an ATV. In the 1997 survey, this included verifying the vehicle had either 3 or 4 wheels and was not a motorcycle or dune buggy. In 2001 an additional question was added that clarified that the vehicle was an ATV. In both years, if the make and model of the vehicle was identified, it was examined to see if it was an ATV. Examples of out-of-scope cases in 2001 included incidents where a child touched a hot engine part, an ATV rider was deliberately hit by a bottle, and an ATV rider was hit by a drunk automobile driver who had veered onto a trail.

To derive the national injury numbers presented in this report, the completed in-scope surveyed cases were scaled to the 93.5% of the annual national estimates based on the NEISS. The 93.5% rate, which is used in CPSC annual reports from 1997 onwards, was used to account for out-of-scope cases in the NEISS. The common rate was used for both study years, rather than rates based on the analysis of completed surveys from the two years. This was done because the two studies differed in the degree to which the scope of cases was examined prior to survey assignment. By using the common rate, the results are more comparable between the two years.

For each of the 20 subgroups, the NEISS weights of the completed in-scope surveys were rescaled to the corresponding estimated yearly total of the subgroup. The 20 subgroups consisted of all the combinations of the five NEISS strata, the age class of the injured person (<16 versus ≥16), and the gender of the injured person.

This scaling accounts for both the effects of (1) the survey non-response in the study period and (2) the differences in the injured population during the study period and the year as a whole. More specifically, the scaling adjusts for any under representation in the NEISS strata, the injured person age class, or injured person gender among the completed surveys as compared to the injured population for the study period. Additionally, the injured population during the study period may not reflect the annual injured population. For example, the study period mainly consisted of summer months. Therefore, children may be over represented in the study period as compared to the year as a whole. The rescaling based on the 20 subgroups adjusts for such differences.

For each analysis, all cases with non-missing information were scaled to the estimated yearly total by this procedure. For example, consider the driving hours estimate for male drivers. For each of the 20 subgroups, the cases with surveys that had both driver gender and driving hour information available were scaled to the corresponding yearly national estimate of the number of cases in the subgroup.

1997 Injury Study

The details of the 1997 injury study can be found in its associated report (Kyle and Adler 1998). The study consisted of all NEISS cases with treatment dates from May 1 to August 31, 1997 and product codes 3285-3287. This resulted in 529 cases. Of these, 42 were determined to be out of scope prior to surveying. Of the remaining cases, 319 cases were contacted and surveyed.

2001 Injury Study

The study consisted of all NEISS cases with treatment dates from July 25 to December 31, 2001 and product codes 3285-3287. The disposition of the cases was as follows:

- 1165 Cases with treatment dates from July 25 to December 31, 2001 and product codes 3285-3287.
- 846 Cases from hospitals that provide contact information.
- 532 Cases contacted and surveyed.
- 476 Cases surveyed and declared in scope.

The overall survey completion rate was $532/1165=46\%$. Removing from consideration 319 cases from hospitals that do not regularly provide contact information, the survey completion rate was $532/846=63\%$. Note that the percent of the surveys that were in-scope should not be used directly to adjust the yearly NEISS estimates of ATV injuries. The assignment for surveying was performed automatically and immediately based on the NEISS product codes. All NEISS cases are routinely examined with quality control procedures to identify coding errors. Some cases that were assigned as ATV-related cases

would have been identified at a later time as not involving an ATV through these quality control procedures.

Exposure Studies

The 1997 and 2001 exposure studies were sponsored by industry and designed and overseen by Heiden Associates, Inc. They were designed to be analogous to the CPSC ATV studies. The studies used market panels and were conducted by NFO Research, Inc.

The studies each had two stages. In the first stage, a screener survey was mailed to a market panel of approximately 100,000 households. The screener survey asked how many ATVs the household owned and how many members of the household had ridden ATVs during the past year. Based on the results of the screener survey, two samples of households were generated. The first sample consisted of households that owned an ATV. The second sample consisted of households that did not own an ATV, but had members that had ridden an ATV in the last year.

The owning and non-owning household samples were each surveyed by telephone in the second stage. Both classes of households were surveyed about the members of the household that rode ATVs, either as drivers or as passengers. A driver was defined as a rider who operated an ATV and may have also rode as a passenger on an ATV. A passenger was defined as a rider who rode only as a passenger on an ATV. From each household, the rider whose birthday was closest to the survey date was selected. The selected rider was asked a set of detailed questions about his or her riding experience and usage. The owning households were also surveyed about each ATV owned by the household.

From the two survey stages, national estimates of the number of ATVs, drivers, and passengers were calculated. For example, the number of ATVs in the U.S. was calculated as follows. The proportion of U.S. households that owned an ATV was estimated from the screener survey. From the second stage survey, the proportion of these households that had a verifiable ATV in operating condition was estimated. From the second stage survey, the average number of ATVs owned by such households was estimated. Using the U.S. Census estimates of the number of U.S. households, the total number of ATVs was calculated as the product of these estimates. The estimated numbers of ATV drivers and passengers were calculated similarly. One notable difference for these estimates was that they consisted of two estimates each: the number of U.S. riders in owning households and the number of U.S. riders in non-owning households. Each of these two estimates was derived using the corresponding sample of households.

To derive the total driving and riding hour estimates, the average hours per driver and passengers were calculated for 8 estimation subgroups among the surveys with the available data. The 8 subgroups consisted of all the combinations of ATV ownership (owning households versus non-owning households), age class (<16 versus ≥16), and gender. The total estimates were calculated as the sum of the products of these averages multiplied by the corresponding estimates of the number of riders in the subgroup.

For the subgroup analyses, drivers and riders with the available information were scaled to the national estimates by the 8 estimation subgroups defined in the last paragraph. For example, consider the driver experience subgroup analysis. The drivers with available driver experience information were weighted to the national estimate of the number of drivers for each the 8 estimation subgroups. To derive the number of drivers estimate, the drivers were then classified by their driving experience and the corresponding weights summed. To derive the number of driving hours measure, drivers with both driver experience and driving hour information were weighted to the national estimates by the 8 estimation subgroups. For each driver experience subgroup, the driving hours of each driver were weighted and summed. Because of missing data and the fact that the weights are based on the number of drivers and not the number of driving hours, there are small differences in the sum of the hours across the subgroups and the total hours.

For the joint characteristic analyses, it was necessary to associate individual ATVs and drivers. The surveys only obtained ATV vehicle information from owning households and therefore, this association was only possible for drivers in owning households. In households in which there was only one ATV, this ATV was associated with all drivers from the household. In 2001 drivers from households with more than one ATV could specify a second ATV as their primary ATV. The first ATV from the households was associated with the driver, unless the driver explicitly stated the second ATV was their primary ATV. It is not always possible from the survey to determine how much, if ever, the driver used the ATV associated with the driver. For this reason the results in the section should be interpreted with caution.

1997 Exposure Study

In 1997 the screener survey was mailed to the panel of households in July and August 1997. The second stage survey was conducted in October 1997.

For the screener survey, the disposition of the households was as follows:

140,000	Number of Surveys Mailed
101,758	Number of Surveys Completed.
73%	Completion rate.

For the second stage survey, the disposition of households is as follows:

	Owning Households	Non-Owning Households
Number of Surveys Attempted	1,600	400
Number of Surveys Completed	1,273	342
Completion Rate	80%	86%

2001 Exposure Study

In 2001 the screener survey was mailed to the panel of households in July 2001. The second stage survey was conducted in October and November 2001. For the screener survey, the disposition of the households was as follows:

100,000	Number of Surveys Mailed
69,978	Number of Surveys Completed.
70%	Completion rate.

For the second stage survey, the disposition of households is as follows:

	Owning Households	Non-Owning Households
Number of Surveys Attempted	2,200	1,100
Number of Surveys Completed	1,419	709
Completion Rate	65%	64%

Additional Analysis Details

In the analysis of riding hours in both the exposure and injury studies, some common rules proposed by Heiden Associates, Inc were used.

- Observations with riding time per day greater than 24 hours were removed.
- Observations with driving time per year greater than 5,400 hours were removed.
- Observations with driving time per year between 1,800 and 5,400 hours were assigned 1,800 hours.
- Observations with passenger time per year greater than 2,100 hours were removed.
- Observations with passenger time per year between 240 and 2,100 hours were assigned 240 hours

Appendix 2: Rider and Driver Age Details

Table A1: U.S. Injury, Exposure and Risk ATV Estimates by Rider Age Details.

		Age							
		0 to <6	6 to <12	12 to <16	16 to <18	18 to <25	25 to <45	45 to <65	≥65
Injuries	1997	1,311	8,191	11,629	5,071	10,137	14,257	2,952	464
	2001	1,968	12,093	19,010	7,567	26,867	33,143	7,792	689
	% Increase	50.1%	47.6%	63.5%	49.2%	165.0%	132.5%	163.9%	48.6%
Riders (Million)	1997	1.5	2.7	2.4	1.0	1.2	6.3	2.6	0.4
	2001	2.0	3.0	2.2	1.2	1.7	7.6	4.4	0.9
	% Increase	35.3%	10.0%	-8.1%	15.7%	44.9%	21.1%	64.9%	104.4%
Riding Hours (Million)	1997	29	137	262	115	133	734	330	60
	2001	66	215	293	154	217	936	592	134
	% Increase	132.6%	56.7%	11.8%	33.4%	63.5%	27.4%	79.4%	122.8%
Injuries / Thousand Riders	1997	0.9	3.0	4.9	5.0	8.8	2.3	1.1	1.1
	2001	1.0	4.1	8.6	6.5	16.0	4.4	1.8	0.8
	% Increase	10.9%	34.3%	77.9%	29.0%	82.9%	91.9%	60.1%	-27.3%
Injuries / Million Riding Hours	1997	46.0	59.6	44.4	44.0	76.4	19.4	8.9	7.7
	2001	29.7	56.2	64.9	49.2	123.8	35.4	13.2	5.1
	% Increase	-35.5%	-5.8%	46.2%	11.9%	62.1%	82.4%	47.2%	-33.3%

Note: The risk and percent increase values are calculated from the injury and exposure measures based on values with greater precision than the values presented in the table.

Table A2: U.S. Injury, Exposure and Risk ATV Estimates by Driver Age Details.

Age	Injuries							
	0 to <6	6 to <12	12 to <16	16 to <18	18 to <25	25 to <45	45 to <65	≥65
	256	7,224	10,974	6,594	11,161	15,270	2,985	236
	854	8,883	19,277	9,444	29,364	33,564	8,895	1,420
	% Increase	233.1%	23.0%	75.7%	43.2%	163.1%	119.8%	198.0%
	1997	0.0	0.7	0.8	0.9	5.3	2.1	0.4
	2001	0.1	1.0	1.1	1.5	6.5	3.6	0.8
	% Increase	149.7%	43.0%	-1.6%	43.6%	57.3%	21.9%	70.5%
	1997	8	105	98	118	661	297	56
	2001	13	148	250	150	209	566	130
	% Increase	70.5%	41.5%	52.5%	76.5%	35.7%	90.7%	133.0%
	1997	6.9	10.3	6.2	8.6	12.0	2.9	1.4
	2001	9.2	8.9	11.0	8.6	20.1	5.2	2.4
	% Increase	33.4%	-14.0%	78.5%	-0.2%	67.3%	80.3%	74.8%
	1997	33.3	69.1	47.3	67.2	94.4	23.1	10.1
	2001	65.1	60.0	77.2	63.1	140.8	37.4	15.7
	% Increase	95.3%	-13.1%	63.2%	-6.1%	49.1%	61.9%	56.3%
	1997	33.3	69.1	47.3	67.2	94.4	23.1	10.1
	2001	65.1	60.0	77.2	63.1	140.8	37.4	15.7
	% Increase	95.3%	-13.1%	63.2%	-6.1%	49.1%	61.9%	56.3%

Note: The risk and percent increase values are calculated from the injury and exposure measures based on values with greater precision than the values presented in the table.

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APPENDIX K

American National Standard

for

**Four Wheel All-Terrain Vehicles –
Equipment, Configuration, and
Performance Requirements**

ANSI / SVIA - 1 - 2001



Standards Developer
Specialty Vehicle Institute of America



Approved February 15, 2001
American National Standards Institute, Inc.

Foreword (This Foreword is not part of American National Standard ANSI / SVIA - 1 - 2001)

This standard for four wheel all-terrain vehicles (ATVs) is a revision of American National Standard ANSI/SVIA 1-1990 and has been developed by members of the Specialty Vehicle Institute of America (SVIA) and other manufacturers of all-terrain vehicles.

Work on the original standard was undertaken by the SVIA in 1985 and completed with the publication of ANSI/SVIA 1-1990. Building on these prior efforts, this revised voluntary standard addresses design, configuration and performance aspects of ATVs, including, among other items, requirements for mechanical suspension; throttle, clutch and gearshift controls; engine and fuel cutoff devices; lighting; tires; operator foot environment; service and parking brake/parking mechanism performance; and pitch stability. Additional requirements, which address maximum speed capability and speed limiting devices, are included for youth-sized ATVs. This present revision modifies certain definitional language and adds several provisions to enhance and clarify the standard.

The standard reflects positively on the high degree of government-industry cooperation that contributed significantly to the development of this standard.

Consensus for this standard was developed by use of the Canvass Method. Suggestions for improvement of this standard will be welcome. They should be addressed to the Specialty Vehicle Institute of America, 2 Jenner Street, Suite 150, Irvine, California 92618-3806.

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American National Standard

for Four Wheel All-Terrain Vehicles - Equipment, Configuration, and Performance Requirements

1. Scope

This standard establishes requirements for equipment, configuration, and performance of four wheel all-terrain vehicles.

2. Referenced Standards

This standard is intended to be used with the following standards, recommended practices and information reports:

Code of Federal Regulations, Title 49, Subtitle B, Ch. V, Part 565, Vehicle Identification Number Requirements; Part 571, Federal Motor Vehicle Safety Standards (FMVSS) and Part 574, Tire Identification and Record Keeping. Code of Federal Regulations, Title 40, Part 205, Subpart D Motorcycles, Appendix I-1, Test Procedure for Street and Off-Road Motorcycles.¹

European Union Electromagnetic Compatibility Standard, Council Directive 72/245/EEC as amended; and Directive 97/24/EC Chapter 8, Electromagnetic Compatibility.²

Society of Automotive Engineers Standard, SAE J585 DEC94, Tail Lamps for Use on Motor Vehicles Less Than 2032 mm in Overall Width; Recommended Practice, SAE J1623 FEB94, All-Terrain Vehicle Headlamps; Standard, SAE J586 SEP95, Stop Lamps for Use on Motor Vehicles Less Than 2032 mm in Overall Width; Recommended Practice SAE J278 MAY95, Snowmobile Stop Lamp and Information Report, SAE J1451 FEB85, A Dictionary of Terms for the Dynamics and Handling of Single Track Vehicles.³

Tire Size Nomenclature Standards.⁴

United States Department of Agriculture, Forest Service Standard for Spark Arresters for Internal Combustion Engines, 5100-1b, July 1991.⁵

¹ Available from the Superintendent of Documents, U.S. Printing Office, Washington, DC 20402

² Available from the U.S. Dept. of Commerce, Office of EC Affairs, Rm. 3036, Washington, DC 20230

³ Available from the Society of Automotive Engineers, 400 Commonwealth Dr., Warrendale, PA 15096

⁴ Available from the Tire and Rim Association, 175 Montrose West Ave., Copley, OH or the Japan Automobile Tire Mfrs. Assn., Toranomon Bldg., 1-1-12, Toranomon, Minato-Ku, Tokyo 105, Japan

⁵ Available from U.S. Department of Agriculture Forest Service, Equipment Development Center, San Dimas CA 91773

3. Definitions.

all-terrain vehicle (ATV). Any motorized off-highway vehicle designed to travel on four low pressure tires, having a seat designed to be straddled by the operator and handlebars for steering control, and intended for use by a single operator and no passenger.

ATVs are subdivided into four categories as follows:

- (1) *Category G (General Use Model) ATV.* An ATV intended for general recreational and utility use.
- (2) *Category S (Sport Model) ATV.* An ATV intended for recreational use by experienced operators only.
- (3) *Category U (Utility Model) ATV.* An ATV intended primarily for utility use.
- (4) *Category Y (Youth Model) ATV.* An ATV intended for recreational off-road use under adult supervision by operators under age 16. Youth model ATVs can further be categorized as follows:
 - (a) *Category Y-6 ATV.* A Category Y-6 ATV is a youth model ATV which is intended for use by children age 6 and older.
 - (b) *Category Y-12 ATV.* A Category Y-12 ATV is a youth model ATV which is intended for use by children age 12 and older.

accessory. An object or device that is affixed to the ATV after its manufacture. It is not essential to the ATV's basic operation, but it changes its styling, convenience, utility, or effectiveness.

brake lever or handle. A hand-operated control which, when actuated, causes the brakes to be applied.

brake pedal. A foot-operated control which, when actuated, causes the brakes to be applied.

brake stopping distance (S). Distance traveled by an ATV from the start of a brake application to the point at which the ATV reaches a complete stop.

braking deceleration. The rate of change of vehicle speed from the point of initial brake application to the point where the vehicle stops.

cargo area. Rack(s) or other designated area(s) where the manufacturer intends cargo to be loaded and secured on the ATV.

carry bar. A rigid fixture mounted at the rear of the ATV. It can be used for lifting, moving or transporting the vehicle.

clutch lever. The hand control that engages and disengages a manual clutch.

electric starter. The electric motor of an ATV that cranks the engine for starting. Also called the *engine starter*.

electric start interlock. A device that prevents the ATV engine from being started by electric cranking under certain conditions.

electromagnetic compatibility. The capability of an electric or electronic device to inhibit emissions that cause electromagnetic interference (EMI) or to be protected against radiated electromagnetic interference.

engine displacement. The volume swept by a piston moving from bottom dead center to top dead center, multiplied by the number of cylinders.

engine stop switch. A device used to stop engine operation.

flag pole. A long, thin, semi-rigid, vertical pole with a brightly colored pennant, usually red or orange, on the top end, which attaches at the rear of the ATV.

flag pole bracket. A rigid attachment point for mounting a flag pole.

footrest. A structural support for the operator's foot. Footrests include footpegs and footboards.

gearshift control. A control for selecting among a number of sets of transmission gears.

handlebar. A device used for steering and rider support and as a place to mount hand-operated controls.

handlebar crossbar. A rigid member which attaches to and connects the left and right sides of the handlebar.

ignition system. The system in a spark-ignited internal combustion engine that ignites the mixture by producing a spark.

key-operated security system. A method of rendering an ATV inoperable unless the correct key is used.

left hand. This designation refers to the orientation of the ATV relative to the operator when seated in the operator's position facing forward.

low pressure tire. A tire designed for off-road use on all-terrain vehicles, and having a recommended tire pressure of no more than 69 kPa (10 psi).

manual clutch. A device activated by the operator to disengage the engine from the transmission. *See clutch lever.*

manual fuel shutoff control. A manual device designed to turn the fuel flow from the fuel tank on and off.

may. This word is understood to be permissive.

mechanical suspension. A system which permits vertical motion of an ATV wheel relative to the chassis and provides spring and damping forces.

neutral. A designated transmission position where there is no continuity or direct mechanical connection between transmission input and output.

neutral indicator. A light or other means of indicating when an ATV transmission is in the neutral position.

operator. The person who is exercising control over the motion of the vehicle. Also called the *rider*. However, the term *rider* does not include a passenger since ATVs are intended for use only by a single operator with no passengers.

owner's manual. A publication, supplied by the manufacturer as part of the ATV, which provides information and instruction regarding use, operation, care, and maintenance of the ATV. This publication also may be identified as "operator's manual."

parking brake. A brake system which, after actuation, holds one or more brakes continuously in an applied position without further action.

parking mechanism. A drive train system that locks the drive train when the transmission control is placed in a designated park position.

power take-off (PTO). An external drive mechanism on an ATV which provides rotational power to drive accessory equipment or other devices.

right hand. This designation refers to the orientation of the ATV relative to the operator when seated in the operator's position facing forward.

service brake. The primary brake system used for slowing and stopping a vehicle. ATVs may have more than one service brake.

shall. This word is understood to be mandatory.

should. This word is understood to be advisory.

spark arrester. An exhaust system component which limits the size of carbon particles expelled from a tailpipe.

speed limiting device. A device intended to limit the maximum speed of a vehicle.

test operator. The person who is exercising control over the ATV under test. The test operator shall be skilled at ATV operation and shall be familiar with the ATV under test and the test being conducted. The test operator, during the performance of a test, shall be seated in a normal upright position appropriate for the test being conducted.

throttle control. A control which is located on the handlebar and is used to control engine power.

transmission. A device for transmitting power at more than one set of speed and torque ratios.

vehicle load capacity. The highest load, including the operator's weight, recommended by the manufacturer to be carried by an ATV in its "as manufactured" condition. This does not include the vehicle weight.

VIN. Means the Vehicle Identification Number.

wheelbase (L). The longitudinal distance from the center of the front axle to the center of the rear axle.

wheel travel. The displacement of a reference point on the suspension (such as the wheel axle) from when the suspension is fully extended (no force applied) to when it is fully compressed.

4. Vehicle (ATV) Equipment and Configuration

4.1 Service Brakes. All ATVs shall have either independently-operated front and rear brakes, or front and rear brakes that are operated by a single control, or both. These brakes shall meet the requirements of paragraph 7.3.

4.1.1 Independently-Operated Front Brakes. Independently-operated front brakes shall be operated by a lever located on the right side of the handlebar, and operable without removing the hand from the handlebar.

4.1.2 Independently-Operated Rear Brakes. Independently-operated rear brakes shall be operated by either a pedal which is located near the right footrest and operable by the right foot, or if no clutch lever, by a lever located on the left side of the handlebar and operable without removing the hand from the handlebar, or by both.

4.1.3 Simultaneously-Operated Front and Rear Brakes. Simultaneously-operated front and rear brakes shall be operated by either a pedal which is located near the right footrest and operable by the right foot, or if no clutch lever, by a lever located on the left side of the handlebar and operable without removing the hand from the handlebar, or by both.

4.2 Parking Brake/Parking Mechanism. All ATVs shall have a parking brake or parking mechanism capable of holding the ATV stationary under prescribed conditions. The parking brake or parking mechanism shall meet the requirements of section 8.

4.3 Mechanical Suspension. All ATVs shall have mechanical suspension for all wheels. Each wheel shall have a minimum wheel travel of 50 mm (2 inches). Springing and damping properties shall be provided by components other than the tire.

4.4 Engine Stop Switch. All ATVs shall have an engine stop switch which is mounted on the left handlebar and is operable by the thumb without removing the hand from the handlebar.

4.4.1 Operation. This switch shall not require the operator to hold it in the off position to stop the engine.

4.4.2 Color of Device. The switch-operating device shall be orange or red.

4.5 Manual Clutch Control. All ATVs equipped with a manual clutch shall have a clutch lever, which is located on the left side of handlebar and operable without removing the hand from the handlebar.

4.6 Additional Clutch Control for Utility ATVs. All ATVs of Category U ("Utility") that have a power take-off (PTO) or other device requiring fixed engine or vehicle speed, and a clutch control for engagement and disengagement of the PTO or other device, shall have the control located convenient to the operator. Control movement shall be forward or upward, or both, for engagement, and rearward or

downward, or both, for disengagement. A durable label clearly identifying the positions for engagement and disengagement for the PTO or other devices shall be provided.

4.7 Throttle Control. All ATVs shall be equipped with a means of controlling engine power through a throttle control. The throttle control shall be located on the right side of the handlebar and shall be operable without removing the hand from the handlebar.

4.7.1 Operation. The throttle control shall be self-closing to an idle position upon release of the operator's hand from the control.

4.7.2 Options for Utility ATVs With PTO or Other Device. All ATVs of Category U ("Utility") that have a power take-off (PTO) or other device requiring fixed engine or vehicle speed, and a clutch control for engagement and disengagement of the PTO or other device, may be equipped with a throttle control which does not meet the location requirements of 4.7 or the return to-idle requirement of 4.7.1, provided that it meets the requirements of 4.7.2.1. through 4.7.2.4.

4.7.2.1 Operation of Engine Speed Control. An engine speed control for the PTO or other device shall be operable only when the PTO or other device is in operation.

4.7.2.2 Direction of Motion. The direction of motion for such throttle control for the PTO or other device shall be forward or upward, or both, to increase speed, and rearward or downward, or both, to decrease speed or to stop.

4.7.2.3 Automatic Stopping. A means shall be provided to automatically stop the PTO or other device, or to stop the engine, when the operator leaves the normal seated operating position of the ATV while the PTO or other device is operating and the transmission is in gear.

4.7.2.4 Stationary Operation. A means may be provided to allow use of the PTO or other device while the ATV is stationary and the operator is not in the normal seated operating position. Such means shall automatically return to the operational mode of 4.7.2.3 when the transmission is placed in gear.

4.8 Drivetrain Controls

4.8.1 Manual Transmission Gearshift Control. All ATVs equipped with a manual transmission gearshift control shall have the control located so as to be operable by the operator's left foot or left hand.

4.8.1.1 Operation of a Foot Gearshift Control. If equipped with a foot gearshift control, an upward motion of the operator's toe shall shift the transmission towards higher (lower numerical gear ratio) gears, and a downward motion towards lower gears. If equipped with a heel-toe (rocker) shifter, an upward motion of the toe or a downward motion of the heel shall shift the transmission towards higher gears and a downward motion of the toe towards lower gears.

4.8.1.2 Operation of a Hand Gearshift Control. If equipped with a hand gearshift control, moving a control upward or depressing the upper portion of the control shall shift the transmission towards higher (lower numerical gear ratio) gears, and moving the control downward or depressing the lower portion of the control shall shift the transmission towards lower gears.

4.8.1.3 Gear Selection. If three or more gears are provided, it shall not be possible to shift from the highest gear directly to the lowest gear, or vice versa.

4.8.2 Other Controls. Controls for selecting forward, neutral, or reverse or for selecting overall transmission ranges, or for selecting the differential drive (2-wheel or 4-wheel), may be located and operated differently, and shall have a defined shift pattern marked for the operator:

4.9 Neutral Indicator. All ATVs with a neutral position, except those equipped with a manual clutch, shall have either a neutral indicator readily visible to the operator when seated on the ATV or a means to prevent starting of the ATV unless the transmission is in the neutral position. The indicator, if provided, shall be activated whenever the ignition system is on and the transmission is in neutral.

4.10 Reverse Indicator. All ATVs with a reverse position shall have a reverse indicator readily visible to the operator when the operator is seated on the ATV. The indicator shall be activated whenever the engine is running and the transmission is in reverse.

4.11 Electric Start Interlock. An interlock shall be provided to prevent the ATV engine from being started by electric cranking unless the clutch is disengaged, the transmission is in neutral or park, or the brake is applied.

4.12 Carry Bar. All ATVs shall be equipped with a carry bar or equivalent device located at the rear of the seat to facilitate manual lifting or moving of the ATV. The carry bar shall be designed and located such that when the ATV is standing on its rear wheels and the carry bar, on level ground, the plane defined by the centers of the front and rear wheels shall not pass beyond an angle 90 degrees to the ground.

4.13 Flag Pole Bracket. All ATVs shall have a flag pole bracket at the rear of the ATV that provides a rigid mounting location for a flag pole having a 13 mm (0.5 inch) diameter mounting shaft.

4.14 Manual Fuel-Shutoff Control. If an ATV is equipped with a manual fuel-shutoff control, the device shall be operable as prescribed in 49 CFR, Ch.V Part 571 (FMVSS) Subpart B at 571.123, Table 1.

4.15 Handlebars. The handlebar and its mounting shall present no rigid materials with an edge radius of less than 3.2 mm (0.125 inch), that may be contacted by a probe in the form of a 165 mm (6.5 inch) diameter sphere. The probe shall be introduced to the handlebar mounting area. It shall not be possible to touch any part of any edge that has a radius of less than 3.2 mm (0.125 inch) with any part of the probe. Handlebar crossbar, if provided, shall be padded.

4.16 Operator Foot Environment. All ATVs shall have a structure or other design feature which meets the requirements in 4.16.1 to 4.16.4 (3).

4.16.1 Test Procedure. Compliance shall be determined by introduction of a probe, whose end is a rigid flat plane surface 75 mm (3 inches) in diameter, in the prescribed direction to the zones as described in 4.16.2 and 4.16.3 and as shown in Figures 1 and 2, pages 19 and 20 respectively.

4.16.1.1 Inserting Probe Vertically and Downward. The probe shall be introduced end-first in a vertical and downward direction to the zone described in 4.16.2 and shown by the shaded portion

of Figure 1. The end of the probe in its entirety shall remain within the limits of the zone. It shall not penetrate the zone sufficiently to touch the ground when applied with a force of 445 N (100 lbf).

4.16.1.2 Inserting Probe Horizontally and Rearward. The probe shall be introduced end-first in a horizontal and rearward direction to the zone described in 4.16.3 and shown by the shaded portion of Figure 2. The end of the probe in its entirety shall remain within the limits of the zone. It shall not penetrate the zone sufficiently to touch the rear tire when applied with a force of 90 N (20 lbf).

4.16.2 Zone in Figure 1. The zone shown in Figure 1 is defined as bounded by:

- (1) The vertical projection of the rear edge of the footrest.
- (2) The vertical plane (line AA), parallel to the ATV's longitudinal plane of symmetry, that passes through the inside edge of the footrest.
- (3) The vertical projection of the intersection of a horizontal plane passing through the top surface of the footrest, and the rear fender or other structure.
- (4) The vertical plane passing through point D and tangent to the outer front surface of the rear tire.

(a) For footpegs, Point D is defined as the intersection of the lateral projection of the rearmost point of the footpeg and the longitudinal projection of the outermost point of the footpeg.

(b) For footboards, Point D is defined as the intersection of 2 lines. The first is a line perpendicular to the vehicle longitudinal plane of symmetry and one-third of the distance from the front edge of the rear tire to the rear edge of the front tire. The second is a line parallel to the ATV's longitudinal plane of symmetry and one-half the distance between the inside edge of the footboard and the outside surface of the rear tire.

4.16.3 Zone in Figure 2. The zone shown in Figure 2 is defined as bounded by:

- (1) The horizontal plane passing through the lowest surface of the footrest on which the operator's foot (boot) rests (plane F).
- (2) The vertical plane (line AA), parallel to the ATV's longitudinal plane of symmetry, that passes through the inside edge of the footrest.
- (3) The horizontal plane 100 mm (4 inches) above plane F.
- (4) The vertical plane (line BB), parallel to the ATV's longitudinal plane of symmetry and 50 mm (2 inches) inboard of the outer surface of the rear tire.

4.16.4 Requirements for ATVs with Non-Fixed Structure. In the case of ATVs equipped with a non-fixed type (for example, foldable, removable or retractable) structure intended to meet the requirements of this section, such ATVs shall be equipped with one or more of the following:

(1) *Warning Device.* A warning device (for example, a buzzer or indicator) to indicate that the structure is not in the position needed to comply with these requirements.

(2) *Device Preventing Operation of ATV.* A device to prevent the ATV from being operated under its own power if the structure is not in the position needed to comply with these requirements.

(3) *Structure That Prevents Normal Use of Footrest when Structure is Folded, Retracted, or Removed.* A structure that can be folded, retracted, or removed, such that when the structure is folded, retracted, or removed, the ATV cannot be operated using the footrest in the normal manner.

4.17 Lighting Equipment

4.17.1 Headlamps, Tail Lamps and Stop Lamps. All ATVs except Category Y vehicles shall 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. ATVs may be optionally equipped with a stop lamp or combination tail-stop lamp, and such lamp(s) shall be illuminated by the actuation of any service brake control.

4.17.2 Specifications. Headlamps shall conform to Recommended Practice, SAE J1623 FEB94; and tail lamps shall conform to Standard, SAE J585 DEC94. If the ATV is equipped with a stop lamp, such lamp(s) shall conform to Standard, SAE J586 SEP95 or Recommended Practice, SAE J278 MAY95.

4.17.3 Requirements for Category Y ATVs. Category Y vehicles shall not have a headlamp or tail lamp.

4.18 Spark Arrester. All ATVs shall have a spark arrester of a type that is qualified according to the United States Department of Agriculture, Forest Service Standard for Spark Arresters for Internal Combustion Engines, 5100-1b, July 1991.

4.19 Tire Marking. All ATV tires shall carry the following markings:

(1) *Inflation Pressure.* Both tire sidewalls shall be marked with the operating pressure or the following statement, or an equivalent message: "SEE VEHICLE LABEL OR OWNER'S MANUAL FOR OPERATING PRESSURE." The messages required by this section shall be in capital letters not less than 4 mm (0.156 inch) in height.

(2) *Bead Seating Pressure.* Both tire sidewalls shall be marked with the following statement, or an equivalent message: "Do Not Inflate Beyond **psi (**kPa) When Seating Bead."

(3) *Other Markings.* Both tire sidewalls shall have the following information, except where noted:

(a) The manufacturer's name or brand name.

(b) On one tire sidewall, the three-digit week and year of manufacture in accordance with Title 49 CFR, Chapter V, Part 574.5(d), fourth grouping.

(c) The size nomenclature of the tire (for example, AT 22x10-9*) as standardized by the Tire and Rim Association, Inc. or the Japan Automobile Tire Manufacturers Association, Inc.

(d) The word "tubeless" for a tubeless tire.

(e) The phrase or abbreviation "Not For Highway Use," "Not For Highway Service," or "NHS."

(4) *Letter Sizes.* The information required by 4.19.2 and 4.19.3 shall be in letters or numerals no less than 2 mm (.078 inch) in height.

4.20 Tire Pressure Gauge. All ATVs shall be provided with a tire pressure gauge appropriate for the recommended operating tire pressure. All ATVs shall have a means of carrying the tire pressure gauge.

4.21 Security. All ATVs shall have a means to deter unauthorized persons from using the ATV. A key-operated or equivalent system (with a minimum of 300 exclusive combinations) shall be provided for all ATVs except Category Y ATVs, which may use a security system without multiple exclusive combinations.

4.22 Owner's Manual/Operator's Manual. All ATVs shall be provided with a manual at the point of sale. All ATVs shall be equipped with a means of carrying the manual that protects it from destructive elements while allowing reasonable access.

4.23 Vehicle (ATV) Identification Number. All ATVs shall have a VIN that is assigned by the manufacturer as prescribed in Title 49 CFR, Ch. V Part 565.

5. Maximum Speed Capability Measurement

5.1 Test Conditions. Test conditions shall be as follows:

(1) ATV test weight shall be the unloaded ATV weight plus the vehicle load capacity (including test operator and instrumentation), with any added weight secured to the seat or cargo area(s) if so equipped.

(2) Tires shall be inflated to the pressures recommended by the ATV manufacturer for the vehicle test weight.

(3) The test surface shall be clean, dry, smooth and level concrete, or equivalent.

5.2 Test Procedure. Measure the maximum speed capability of the ATV using a radar gun or equivalent method. The test operator, seated in a normal upright position, shall accelerate the ATV until maximum speed is reached, and shall maintain maximum speed for at least 30.5 m (100 ft). Speed measurement shall be made when the ATV has reached a stabilized maximum speed. A maximum speed test shall consist of a minimum of two measurement test runs conducted over the same track, one each in opposite directions. If more than two measurement runs are made there shall be an equal number of runs in each direction. The maximum speed capability of the ATV shall be the arithmetic average of the measurements made. A reasonable number of preliminary runs may be made prior to conducting a recorded test.

6. Youth ATV Requirements

6.1 Speed Limiting Devices. All Category Y ATVs shall be equipped with a means of limiting throttle travel or other means of limiting the maximum speed attainable by the ATV.

6.1.1 Tools Must be Needed to Adjust or Remove Device. The means of limiting maximum speed may be adjustable or removable or both, but shall have means to prevent adjustment or removal without the use of tools.

6.1.2 Maximum Speeds. Speed limiting devices for Category Y-6 ATVs shall be capable of limiting maximum speed to 16 km/h (10 mph) or less when tested in accordance with section 5. Speed limiting devices for Category Y-12 ATVs shall be capable of limiting maximum speed to 24 km/h (15 mph) or less when tested in accordance with section 5.

6.1.3 Delivery of ATV from Manufacturer. All Category Y ATVs shall be delivered from the manufacturer or its designee with the speed limiting device adjusted to limit maximum speed as specified in 6.1.2.

6.2 Maximum Unrestricted Speed Capability. When tested in accordance with section 5., with any removable speed limiting devices removed and with any adjustable speed limiting devices adjusted to provide the ATV's maximum speed capability, the maximum speed capability of Category Y-6 ATVs shall be 24 km/h (15 mph) or less, and the maximum speed capability of Category Y-12 ATVs shall be 48 km/h (30 mph) or less.

7. Service Brake Performance

7.1 Test Conditions. Test conditions shall be as follows:

- (1) The ATV shall be tested at the appropriate test weight described below:
 - (a) If the vehicle load capacity specified by the manufacturer is 91 kg (200 lb) or more, the ATV test weight shall be the unloaded vehicle weight plus 91 kg (200 lb.) (including test operator and instrumentation), with any added weight secured to the seat or cargo area(s) (if equipped).
 - (b) If the vehicle load capacity specified by the manufacturer is less than 91 kg (200 lb), the ATV test weight shall be the unloaded vehicle weight plus the vehicle load capacity (including test operator and instrumentation), with any added weight secured to the seat or cargo area(s) (if equipped).
- (2) Tires shall be inflated to the pressures recommended by the ATV manufacturer for the vehicle test weight.
- (3) Engine idle speed and ignition timing shall be set according to the manufacturer's recommendations.
- (4) Ambient temperature shall be between 0° C (32° F) and 38° C (100° F).
- (5) The test surface shall be clean, dry, smooth and level concrete, or equivalent.
- (6) Any removable speed limiting devices shall be removed. Any adjustable speed limiting devices shall be adjusted to provide the ATV's maximum speed capability.

7.2 Test Procedure. The test procedure shall be as follows:

- (1) Measure the maximum speed capability of the ATV in accordance with section 5. Determine the braking test speed (V). The braking test speed is the speed that is the multiple of 8 km/h (5 mph), which is 6 km/h (4 mph) to 13 km/h (8 mph) less than the maximum speed capability of the ATV.
- (2) Burnish the front and rear brakes by making 200 stops from the braking test speed or 48 km/h (30 mph), whichever is lower. Stops shall be made by applying front and rear service brakes simultaneously, and braking decelerations shall be from 1.96 m/s² to 4.90 m/s² (0.2 g to 0.5 g).
- (3) After burnishing, adjust the brakes according to the manufacturer's recommendation.
- (4) Make six stops from the braking test speed or 48 km/h (30 mph), whichever is lower. Stops shall be made by applying the front and rear service brakes simultaneously, and braking decelerations shall be from 1.96 m/s² to 4.90 m/s² (0.2 g to 0.5 g).
- (5) Make four stops from the braking test speed, applying the front and rear service brakes. Measure the speed immediately before the service brakes are applied. Appropriate markers or instrumentation shall be used which will accurately indicate the point of brake application. Measure the stopping distance (S).
 - (a) For all ATVs other than youth model ATVs, hand lever brake actuation force shall be not less than 22 N (5 lbf) and not more than 245 N (55 lbf), and foot pedal brake actuation force shall be not less than 44 N (10 lbf) and not more than 400 N (90 lbf).
 - (b) For youth model ATVs, hand lever brake actuation force shall be not less than 22 N (5 lbf) and not more than 133 N (30 lbf) and foot pedal brake actuation force shall be not less than 44 N (10 lbf) and not more than 222 N (50 lbf).

(c) For all ATVs other than youth model ATVs, the point of initial application of lever force shall be 30 mm (1.2 inches) from the end of the brake lever. For youth model ATVs, the point of initial application of lever force shall be 25 mm (1 inch) from the end of the brake lever. The direction of lever force application shall be perpendicular to the handle grip in the plane in which the brake lever rotates. The point of application of pedal force shall be the center of the foot contact pad of the brake pedal, and the direction of force application shall be perpendicular to the foot contact pad and in the plane in which the brake pedal rotates.

7.3 Performance Requirements

7.3.1 ATVs With Lower Maximum Speed Capability. During the four stops of 7.2(5), all ATVs with a maximum speed capability of 29 km/h (18 mph) or less shall be capable of making at least one stop that complies with the relationship:

$S \leq V/5.28$	or	$S \leq V$
<i>where</i> S = brake stopping distance (m). V = braking test speed (km/h).		<i>where</i> S = brake stopping distance (ft). V = braking test speed (mph).

7.3.2 ATVs With Higher Maximum Speed Capability. During the four stops of 7.2(5), all ATVs with a maximum speed capability greater than 29 km/h (18 mph) shall be capable of making at least one stop that demonstrates an average braking deceleration of 5.88 m/s² (0.6 g) or greater.

Average braking deceleration can be determined according to the following formula: *

$a = \frac{V^2}{25.92S}$	or	$a = \frac{(0.033) \times V^2}{S}$
<i>where</i> a = average deceleration (m/s ²). S = brake stopping distance (m). V = braking test speed (km/h).		<i>where</i> a = average deceleration (g). S = brake stopping distance (ft). V = braking test speed (mph).

*Direct on-board instrumentation may be used to acquire any measurement data as appropriate.

8. Parking Brake/Mechanism Performance

8.1 Test Conditions. Test conditions shall be as follows:

- (1) ATV test weight shall be the unloaded ATV weight plus weight secured to the seat or cargo area(s) (if equipped), which is equal to the vehicle load capacity.
- (2) Tires shall be inflated to the pressures recommended by the ATV manufacturer for the vehicle test weight.
- (3) The test surface shall be clean, dry, smooth concrete or equivalent, having a 30 percent grade.

8.2 Test Procedure. The test procedure shall be as follows:

(1) Burnish the service brakes according to the procedure specified in 7.2(2) if service brakes are used as part of the parking brake.

(2) Adjust the parking brake or parking mechanism according to the procedure recommended by the ATV manufacturer.

(3) Position the ATV facing downhill on the test surface, with the longitudinal axis of the ATV in the direction of the grade and apply the service brake. Place the transmission in neutral or park and apply the parking brake or parking mechanism (if not already activated by placing the transmission in park). If the ATV is equipped with a parking mechanism allow the drive train to lock. Leave the ATV undisturbed for 5 minutes. Repeat the test with the ATV positioned facing uphill on the test surface.

8.3 Performance Requirements. When tested according to the procedure specified in 8.2, the parking brake or parking mechanism shall be capable of holding the ATV stationary on the test surface, to the limit of traction of the tires on the braked wheels, for 5 minutes in both uphill and downhill directions.

9. Pitch Stability

9.1 Test Conditions. Test conditions shall be as follows:

(1) The ATV shall be in standard condition, without accessories. The ATV and components shall be assembled and adjusted according to the manufacturer's instructions and specifications.

(2) Tires shall be inflated to the ATV manufacturer's recommended settings for normal operation. If more than one pressure is specified, the lowest value shall be used.

(3) All fluids shall be full (oil, coolant, and the like), except that fuel shall be not less than three-fourths full. ATV shall be unladen, with no rider, cargo, or accessories.

(4) Steerable wheels shall be held in the straight ahead position.

(5) Adjustable suspension components shall be set to the values specified at the point of delivery to the dealer.

(6) Suspension components shall be fixed by means of a locking procedure such that they remain in the same position and displacement as when the unladen ATV is on level ground, and in the conditions specified in 9.1(1) through 9.1(5).

9.2 Test Procedure. The test procedure shall be as follows:

(1) Measure and record the wheelbase (L). The measurement of this length shall be done with an accuracy of ± 5 mm (± 0.2 inch) or $\pm 0.5\%$, whichever is greater.

(2) Measure and record the front and rear weights, (W_f and W_r , respectively). W_f is the sum of the front tire loads; and W_r is the sum of the rear tire loads, with the ATV level and in the condition specified in 9.1. The measurements of these weights shall be done with an accuracy of ± 0.5 kg (± 1.1 lb) or $\pm 0.5\%$, whichever is greater.

(3) Using the values obtained in 9.2(1) and 9.2(2), compute and record the quantity as follows:

$$L_1 = \frac{W_f}{W_f + W_r} L$$

(4) Measure and record the vertical height between the rear axle center and the ground (R_r). This measurement shall be done on level ground, with the ATV in the conditions specified in 9.1, with an accuracy of ± 3 mm (± 0.1 inch) or $\pm 1.5\%$, whichever is greater.

(5) Measure and record the balancing angle alpha. The procedure for obtaining this value is as follows: With the ATV on a level surface, the front of the vehicle shall be rotated upward about the rear axle without setting the rear parking brake or using stops of any kind, until the ATV is balanced on the rear tires. The balancing angle alpha through which the ATV is rotated shall be measured and recorded with an accuracy of ± 0.5 degrees. If an assembly protruding from the rear of the ATV, such as a carry bar or trailer hitch or hook, interferes with the ground surface, so as to not allow a balance to be reached, the vehicle shall be placed on blocks of sufficient height to eliminate the interference.

(6) Repeat the measurement in 9.2(5) and determine if the two individual measurements are within 1.0 degree of each other. If they are not, repeat the measurements two more times and compute the average of the four individual measurements, and use that as the value.

9.3 Performance Requirement

9.3.1 Computation. Using the values obtained in 9.2(3), 9.2(4), and 9.2(6), compute the pitch stability coefficient as follows:

$$K_p = \frac{L_1 \tan \alpha}{L_1 + R_r \tan \alpha}$$

9.3.2 Requirement. The pitch stability coefficient K_p calculated according to 9.3.1 shall be at least 1.0.

10. Electromagnetic Compatibility. To achieve international harmonization, electrical and electronic systems shall conform to the performance requirements of Directive 72/245/EEC as amended by Directive 95/54/EC, or Directive 97/24/EC Chapter 8, to be so constructed that they do not cause excessive electromagnetic interference and are not unduly affected by electromagnetic interference.

11. Sound Level Limits

11.1 Newly manufactured all-terrain vehicles. All ATVs as defined in Section 3 of the standard shall be manufactured and equipped so as not to exceed the sound level limits established by the U.S. Environmental Protection Agency for the regulation of noise emissions from off-road motorcycles. These sound level limits, promulgated at Title 40 CFR, Part 205, Subpart D, shall apply to ATVs as follows:

ATVs with engine displacements of 170 cc and lower:80 dB (A)

ATVs with engine displacements greater than 170 cc:82 dB (A)

11.2 Test Procedure. ATV sound level compliance testing shall be conducted in accordance with the procedures set forth in Appendix I-1 to Subpart D of Part 205, Test Procedure for Street and Off-Road Motorcycles.

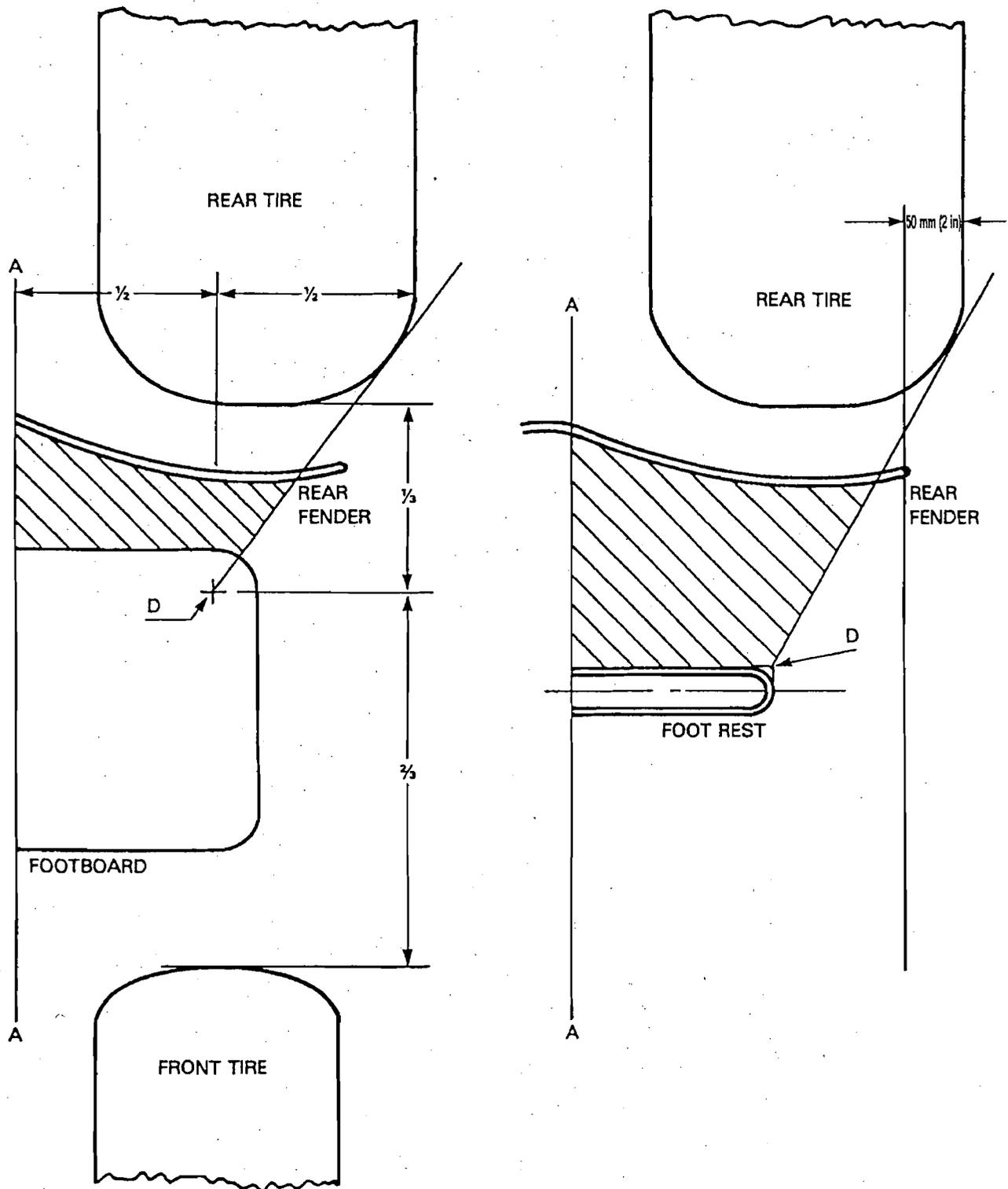


Figure 1
Operator Foot Environment - Plan View

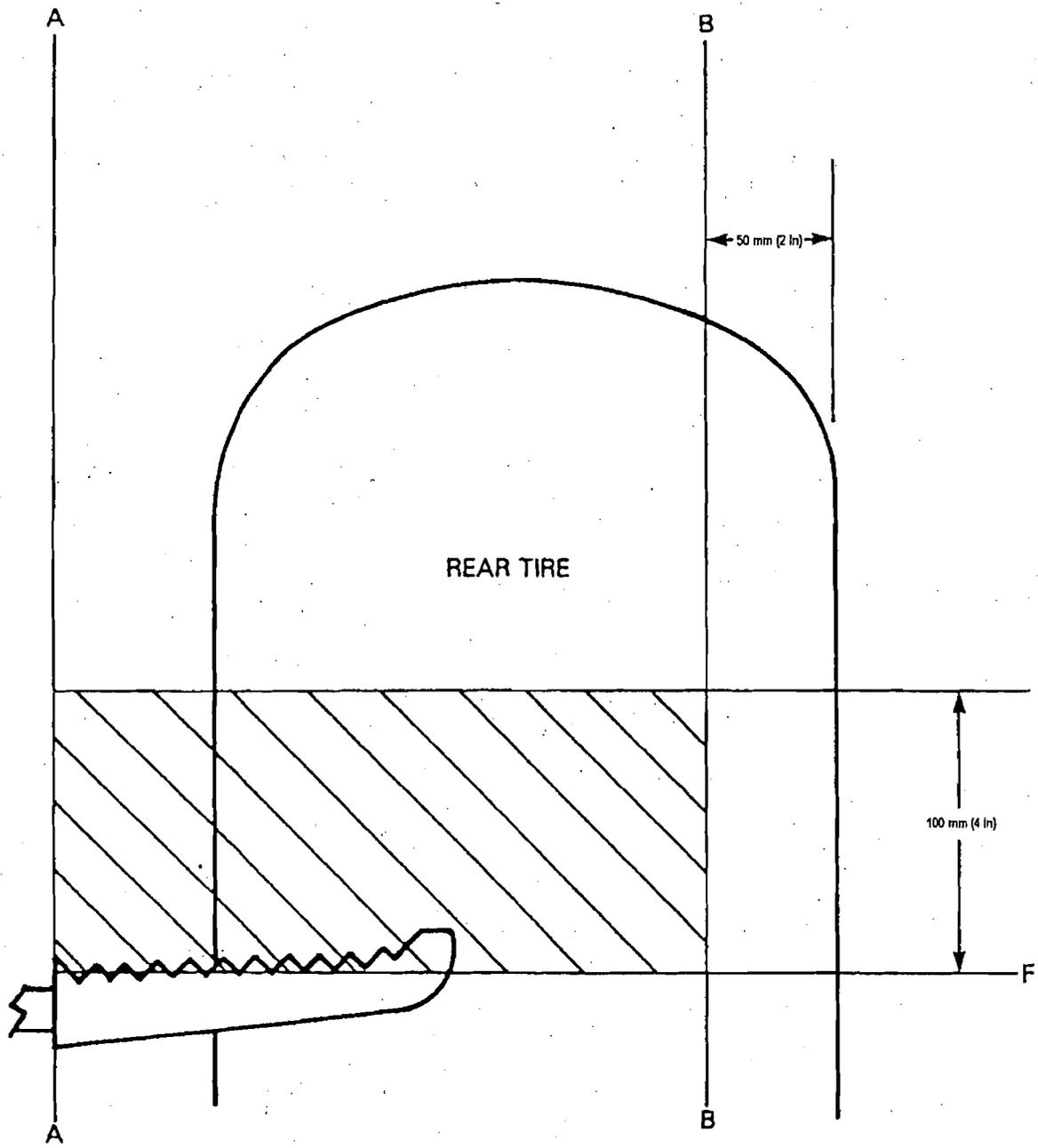


Figure 2
Operator Foot Environment - Front View

Appendix A (This Appendix is not part of the voluntary standard but is included for information only.)

Rationale

This appendix gives the rationale behind various requirements of this voluntary standard. The section numbers in this appendix correspond to those used in the body of the standard.

A3. All-Terrain Vehicle (ATV). The definition of all-terrain vehicle was arrived at after considering the important aspects of the configurations of ATVs that currently exist in the marketplace. ATVs are subdivided into four categories, depending on the type of use intended by the manufacturer or its designee.

A4. Vehicle (ATV) Equipment and Configuration

A4.1 Service Brakes. It is important that the location and method of operation of the brake control be standardized. The specified control locations are consistent with current ATV practice.

A4.2 Parking Brake/Parking Mechanism. The parking brake/mechanism is intended to prevent rolling movement of an ATV when it is parked and left unattended.

A4.3 Mechanical Suspension. Mechanical suspension is provided to increase operator comfort and should also assist in reducing operator fatigue. The definition of wheel travel as a function of suspension is drawn from Society of Automotive Engineers Information Report, SAE J1451 FEB85.

A4.4 Engine Stop Switch. It is important that the location and method of operation of the engine stop switch be standardized. The specified control location is consistent with current ATV practice.

A4.5 Manual Clutch Control. Location of a manual clutch control lever on the left side handlebar is dictated by the fact that this control is used in conjunction with the throttle and must be on the handlebar opposite from the throttle control. The location of this control is consistent with current ATV practice.

A4.6 Additional Clutch Control. ATVs may be equipped with a power take-off or other device which uses drive or propulsion provided by the ATV engine. A standardized method of operation is provided if such device is controlled through a clutch.

A4.7 Throttle Control. A common location and certain aspects of operation of the throttle control are important. The selection of the right side location and the requirement that the throttle be self-closing to idle are consistent with current ATV practice.

A4.8 Drivetrain Controls. Standardization of these controls is achieved by a prescribed location and method of operation.

A4.9 Neutral Indicator. A neutral indicator may help prevent inadvertent starting in gear of an ATV equipped with a centrifugal clutch. The indicator is not needed on an ATV equipped with a manual clutch control. It is difficult to start the engine of such an ATV except when the transmission is in neutral, unless the manual clutch is disengaged.

A4.10 Reverse Indicator. A reverse indicator informs and reminds the operator that reverse has been engaged:

A4.11 Electric Start Interlock. The interlock is designed to prevent unintended movement of the ATV when the engine is being started by electric cranking.

A4.12 Carry Bar. The ATV operator can encounter situations requiring manual lifting or maneuvering of the ATV. The carry bar at the rear of the seat facilitates such action, when necessary. Some ATVs may be stored or transported by standing them on end and securing them in this position so that they take up less space. The carry bar can provide support for this purpose, and the requirement that the wheel centers not pass beyond a 90 degree angle is intended to facilitate this purpose.

A4.13 Flag Pole Bracket. Flag poles are required by law in certain areas. The device used for this purpose usually is a long, thin pole with a brightly colored flag at the top. The requirement for a flag pole bracket is intended to ensure that a secure location is provided for the installation of the pole.

A4.14 Manual Fuel Shutoff. Specified operation of this control is consistent with current motorcycle practice. These requirements do not apply to non-manual fuel shut off methods; for example, electric, vacuum, or other means not requiring direct operator action.

A4.15 Handlebars. The intention is to help minimize the risk of injury due to contact with the handlebar mounting area. The purpose of the specific test procedures provided is to determine which parts can be contacted by the operator's head. The minimum edge radius specified will preclude the use of sharp edges that might contribute to injury. Handlebar crossbar shall be padded to reduce the potential for facial injury in the event of an accident.

A4.16 Operator Foot Environment. The operator foot environment configuration is intended to reduce the possibility of inadvertent contact between the operator's boot and the ground immediately in front of the rear tire, or the rear tire itself. Differing zones are defined for ATVs equipped with footpegs (designed to support the operator's foot with a relatively narrow bar), and footboards (designed to support the operator's foot with a platform-type structure).

A4.17 Lighting Equipment. ATVs of Category G, S, and U can be expected to be used at night or under low-visibility conditions. In the case of recreational ATVs this might be because the operator elects to ride under those conditions, or because, after participating in some activity, it may not be possible to return to base during daylight. In the case of a Category U ATV, the utility purposes for its operation may not coincide with daylight hours or the unit may be used in an area where artificial lighting is needed. For these ATVs, there are occasions when lighting equipment is required or desirable for the purpose of illumination or identification or both. The use of Category Y ATVs by young operators in nighttime and low visibility conditions is to be discouraged by proscribing the installation of headlamps and tail lamps. Moreover, proper supervision of youthful operators is necessary and would be difficult in nighttime or other low visibility conditions.

A4.18 Spark Arrester. Spark arresters are provided for the purpose of suppressing fire ignition and for compliance with federal requirements.

A4.19 Tire Marking. ATV tires operate at pressures substantially below those common for other powered vehicles. Information concerning these low pressures is provided on or with the ATV. The intent of this section is to emphasize the low-pressure nature of these tires, direct the operator to appropriate sources of specific operating pressure recommendations, and to provide other valuable information.

A4.20 Tire Pressure Gauge. Maintenance of the correct tire pressure is important to the handling characteristics of the ATV. A special gauge is needed because ATV tires use a much lower tire pressure than other vehicles.

A4.21 Security. The intention is to permit the person in control of an ATV to retain control and regulate the use of the vehicle. A security system with 300 exclusive combinations is typically used for on-road motorcycles.

A4.22 Owner's Manual/Operator's Manual. A manual is required because it is necessary that certain information be available to the owner/operator and it is not possible to provide all this material on labels affixed to the ATV.

A6. Youth ATV Requirements. This section requires that all Category Y ATVs be equipped with an adjustable or removable speed limiter. The intent is to provide a means by which the supervising adult can limit the ATV's maximum speed capability according to the skill and experience of the young rider. By further requiring that Category Y ATVs be delivered with the speed limiter adjusted to provide the specified slow maximum speeds, it is expected that higher speeds will not be used unless the supervising adult has determined that the young rider has the skill and experience to operate the ATV at higher speeds. This section also includes a requirement that the maximum unrestricted speed capability of Category Y ATVs be limited. It was decided to include this requirement even though no evidence could be found to indicate that the requirement is needed.

A7. Service Brake Performance. This section establishes minimum braking performance requirements which are intended to help ensure that ATVs are equipped with brake systems that are adequate for stopping the vehicle. The requirements in this section are patterned after the requirements in Federal Motor Vehicle Safety Standard No. 122 (FMVSS 122), Motorcycle Brake Systems. The pertinent elements of FMVSS 122 were selected for inclusion in this standard, based on the knowledge and experience of the manufacturers. Certain requirements that appear in FMVSS 122 were not included, because they were determined to be inappropriate, or because it was thought that they would add complexity without providing any benefit. After deciding which elements of FMVSS 122 to include, some of the specific provisions were changed to accommodate (1) physical differences between ATVs and motorcycles, and (2) differences between the off-road operating environment of ATVs and the on-road operating environment of motorcycles.

A8. Parking Brake/Parking Mechanism Performance. The performance requirements are intended to help ensure that the ATV parking brake/mechanism is adequate to prevent rolling movement of the ATV when it is parked and left unattended.