**C. FAIN COMMENTS TO CARB HEARING**
**JANUARY 13, 1994**

GOOD MORNING! MY NAME IS CHARLES FAIN. I AM VICE PRESIDENT OF ENGINEERING FOR CLUB CAR, INC. IN AUGUSTA, GEORGIA AND CHAIRMAN OF THE NATIONAL GOLF CAR MANUFACTURERS ASSOCIATION ENGINEERING COMMITTEE. I HAVE A DEGREE IN MECHANICAL ENGINEERING TECHNOLOGY FROM SOUTH GEORGIA TECH AND SPENT 15 YEARS IN THE LAWN AND GARDEN INDUSTRY, WHERE I WAS VICE PRESIDENT OF ENGINEERING FOR TWO COMPANIES BEFORE JOINING CLUB CAR IN 1990.

I AM HONORED TO HAVE THIS OPPORTUNITY TO SPEAK AT THIS HEARING, TO THE BOARD MEMBERS OF CARB AND TO CARB STAFF ON BEHALF OF THE NATIONAL GOLF CAR MANUFACTURERS ASSOCIATION. THE NATIONAL GOLF CAR MANUFACTURERS ASSOCIATION IS A NATIONAL TRADE ASSOCIATION COMPRISED OF ORIGINAL EQUIPMENT MANUFACTURERS OF GOLF CARS, MANUFACTURED AND SOLD WITHIN THE UNITED STATES.

ASSOCIATION MEMBERS ACCOUNT FOR IN EXCESS OF 95% OF ALL GOLF CARS MANUFACTURED AND DISTRIBUTED WITHIN THE STATE OF CALIFORNIA. WE AS AN ASSOCIATION, HAVE BEEN WORKING WITH CARB STAFF FOR SEVERAL YEARS (FALL '91) TO DEVELOP A FAIR AND UNIFORM EMISSIONS STANDARD TO ACHIEVE THE FEDERAL MANDATES FOR CLEAN AIR.

PRIOR TO THE TIME THE NATIONAL GOLF CAR MANUFACTURERS ASSOCIATION BECAME THE REPRESENTATIVE OF THE GOLF CAR MANUFACTURERS IN REGARDS TO THIS ISSUE, THERE WERE INDEPENDENT DISCUSSIONS BETWEEN CARB AND THE MANUFACTURERS. THOSE DISCUSSIONS AND COMMENTS DID NOT REFLECT THE POSITION OF THE NATIONAL GOLF CAR MANUFACTURERS ASSOCIATION OR ITS PRESENT MEMBERS. NGCMA RECOGNIZES THAT CARB STAFF PERCEIVES THAT THE NGCMA HAS BEEN INCONSISTENT WITH IT'S DIRECTION. WE ARE CONFIDENT THIS PERCEPTION IS DUE TO THOSE EARLIER DISCUSSIONS WITH ONE OR POSSIBLY MORE INDIVIDUAL MANUFACTURERS.

THE NATIONAL GOLF CAR MANUFACTURERS ASSOCIATION HAS REMAINED CONSISTENT THROUGHOUT THESE NEGOTIATIONS BEGINNING WITH ITS PETITION IN NOVEMBER '91. WE HAVE CONSISTENTLY PURSUED ACHIEVING A GASOLINE POWERED GOLF CAR REGULATION THAT IS SIMILAR TO THE CURRENT LAWN AND GARDEN REGULATION IN TIER I AND II. IN NOVEMBER 1991, NGCMA PETITIONED CARB TO REGULATE GOLF CARS BY THE SAME STANDARD USED FOR LAWN AND GARDEN ENGINE REGULATION. THE PREMISE BEHIND THIS REQUEST WAS SIMPLE. SIMILAR ENGINES SHOULD BE SIMILARLY REGULATED. LAWN AND GARDEN EQUIPMENT UTILIZES THE SAME BASIC ENGINES AS GOLF CARS, EXCEPT THAT GOLF CARS EMIT FEWER POLLUTANTS OVER A COMPARABLE TIME PERIOD BECAUSE THEY DO NOT IDLE.

SUBSEQUENTLY, CARB STAFF REPRESENTED TO NGCMA, THAT THEY WOULD RECOMMEND TO THIS BOARD THAT GOLF CARS BE ENTITLED TO MEET FIRST TIER EMISSION STANDARDS SIMILAR TO LAWN AND GARDEN REQUIREMENTS.

BASED ON THIS REPRESENTATION, THE GOLF CAR INDUSTRY SPENT IN EXCESS OF THREE MILLION DOLLARS TO RESEARCH AND DEVELOP GASOLINE POWERED GOLF CARS THAT WOULD MEET REDUCED EMISSION STANDARDS. HOWEVER, ABRUPTLY, CARB STAFF RECANTED THIS REPRESENTATION IN AUGUST 1992, ORIGINALLY PROPOSING THAT BY

JANUARY 1, 1995, ALL GOLF CARS OPERATING IN FEDERAL OZONE NON-ATTAINMENT AREAS MUST BE ELECTRICALLY POWERED. ONLY AFTER NGCMA FILED ITS POSITION STATEMENT DATED AUGUST 3, 1993, STRENUOUSLY OBJECTING TO THIS PROPOSAL DID CARB STAFF RELENT SOMEWHAT AND REVISE THE CUTOFF DATE TO JANUARY 1, 1997.

NO ADDITIONAL TIME PERIOD HAS BEEN ALLOWED FOR REPLACEMENT ENGINES AS IN THE LAWN AND GARDEN REGULATION. THUS, THE CARB PROPOSAL GIVES CALIFORNIA GOLF COURSE AND FLEET OPERATORS OF GASOLINE POWERED GOLF CARS LESS THAN 36 MONTHS TO PLAN FOR AND RAISE SIGNIFICANT CAPITAL FOR CONVERSION TO BATTERY POWERED GOLF CAR FLEETS AND CONSTRUCTION OF STORAGE FACILITIES, IN CONTRAST TO THE 8 YEARS GIVEN LANDSCAPERS AND HOMEOWNERS FOR LAWNMOWERS, AT A SUBSTANTIALLY LESS SIGNIFICANT CAPITAL OUTLAY. INTENSIFYING THE PROBLEM, THE UNDERLYING POPULATION AND EMISSIONS DATA ALLEGEDLY SUPPORTING THIS PROPOSAL COMPLETELY DISREGARDS EXTENSIVE INDUSTRY DATA AND CONTRADICTS SOME EPA FINDINGS.

FURTHERMORE, NGCMA WAS LED TO BELIEVE FROM THE APRIL 1, 1992 WORKSHOP, THAT OFF HIGHWAY RECREATIONAL VEHICLES WOULD MEET A NEW STANDARD SIMILAR TO THE LAWN AND GARDEN REGULATION FOR ENGINES UNDER 25 HP PRODUCED ON OR AFTER JANUARY 1, 1996. THE TERM "SPECIALTY VEHICLE" AS THE LIGHT UTILITY VEHICLE IS NOW NAMED, DID NOT APPEAR OR HAVE A DEFINITION UNTIL MAILOUT #93-08 DATED MARCH 11, 1993. IN THE CURRENT PROPOSED REGULATION, THE EFFECTIVITY DATE TO REGULATE EMISSIONS FOR SPECIALTY VEHICLES IS JANUARY 1, 1995.

THIS WILL ALLOW INDUSTRY LESS THAN ONE YEAR TO PREPARE OPERATING PROCEDURES, ESTABLISH QUALITY CHECK POINTS, AND HAVE VEHICLES SUBMITTED AND CERTIFIED BY CARB. THE 12 MONTH TIME FRAME DOES NOT ALLOW INDUSTRY SUFFICIENT TIME TO MAKE THESE OPERATIONAL PROCEDURE CHANGES NOR DOES IT COMPLY WITH CALIFORNIA LAW REQUIRING A MINIMUM TWO YEAR PERIOD BETWEEN THE TIME A REGULATION IS APPROVED AND WHEN IT BECOMES EFFECTIVE.

ALSO, IN MAILOUT #93-54, ARTICLE 3 ON OFF-HIGHWAY RECREATIONAL VEHICLES AND ENGINES STATES, "THIS ARTICLE SHALL BE APPLICABLE TO NEW SPECIALTY VEHICLE ENGINES UNDER 25 HORSEPOWER (HP) PRODUCED ON OR AFTER JANUARY 1, 1995 AND ALL OTHER OFF-HIGHWAY RECREATIONAL VEHICLES AND ENGINES USED IN SUCH VEHICLES PRODUCED ON OR AFTER JANUARY 1, 1997, FOR SALE, LEASE, USE, AND INTRODUCTION INTO COMMERCE IN CALIFORNIA." WHY? WE DON'T UNDERSTAND WHY SIMILAR ENGINES ARE NOT REGULATED IN A SIMILAR MANNER.

MAILOUT #93-54, PAGE 3, SECTION C, SETS FORTH ESTIMATED EMISSIONS INVENTORIES, SHOWING THE TOTAL CALIFORNIA GOLF CAR POPULATION TO BE 40,000 UNITS. A PREVIOUS EPA STUDY ESTIMATES THE GASOLINE POWERED GOLF CAR NATIONAL POPULATION AT 122,670 UNITS. IF CALIFORNIA HAS 40,000 GASOLINE GOLF CARS, THIS REPRESENTS AN INCREDIBLE 33% OF THE TOTAL U.S. GASOLINE GOLF CAR POPULATION, WHEREAS, CALIFORNIA'S GOLF COURSE CENSUS IS ONLY 6% OF THE U.S. GOLF COURSE CENSUS.

INDUSTRY ESTIMATES A TOTAL <u>COMBINED</u> GOLF CAR FLEET IN CALIFORNIA OF GAS AND ELECTRIC CARS OF 40,000 UNITS. THE TOTAL COMBINED GOLF CAR FLEET IN CALIFORNIA OF 40,000 UNITS IS BROKEN DOWN INTO 14,000 GASOLINE GOLF CARS AND 26,000 ELECTRIC CARS. THIS IS KNOWN DUE TO A CONFIDENTIAL INDUSTRY SURVEY CONDUCTED BY THE ASSOCIATION OF SEVEN DISCRETE MANUFACTURERS COMPLETED IN THE WINTER OF 91/92.

THEREFORE, WE SUBMIT THAT THE GASOLINE GOLF CAR POPULATION IN CALIFORNIA IS APPROXIMATELY ONE-THIRD OF THE 40,000 UNITS BEING ESTIMATED BY CARB STAFF. THAT BEING TRUE, THE ESTIMATED 1992 STATEWIDE BASELINE EMISSIONS CONTRIBUTION OF HYDROCARBONS (HC) CARBON MONOXIDE (CO) AND OXIDES OF NITROGEN (NOX) FOR GOLF CARS SPELLED OUT IN MAILOUT #93-54, AT THE MOST, CAN ONLY BE ONE-THIRD OF THE NUMBERS REPORTED.

THE NATIONAL GOLF CAR MANUFACTURERS ASSOCIATION, IN AN ATTEMPT TO WORK CLOSELY WITH CARB STAFF IN DEVELOPING A FAIR AND UNIFORM EMISSIONS STANDARD FOR GASOLINE POWERED GOLF CARS, CONDUCTED AN EMISSIONS SURVEY OF ITS ENGINES. I WOULD LIKE TO SHARE THAT INFORMATION WITH YOU TO CONTRAST IT WITH THE TONS PER DAY ESTIMATED IN MAILOUT #93-54.

HYDROCARBONS:

CARB ESTIMATE - 8.9 TONS PER DAY
INDUSTRY ESTIMATE - .15 TONS PER DAY
(300 LBS PER DAY)

CARBON MONOXIDE:
CARB ESTIMATE - 38.5 TONS PER DAY
INDUSTRY ESTIMATE - 6.17 TONS PER DAY

OXIDES OF NITROGEN:

CARB ESTIMATE - .2 TONS PER DAY
(400 LBS PER DAY)

INDUSTRY ESTIMATE - .06 TONS PER DAY
(120 LBS PER DAY)

THESE NUMBERS ARE BASED ON EVERY CAR RUNNING MORE THAN ONE ROUND PER DAY.

WE BELIEVE OUR NUMBERS TO BE CORRECT BASED ON TECHNOLOGY CHANGES TO GASOLINE POWERED GOLF CARS IN RECENT YEARS TO IMPROVE THE EMISSIONS OUTPUT LEVEL OF OUR PRODUCTS. CARB STAFF MAY NOT HAVE HAD THE LATEST DESIGN OF ENGINES IN THEIR EVALUATION AND MAY HAVE POSSIBLY INCLUDED A HIGHER POPULATION OF TWO CYCLE ENGINES. THESE TWO-CYCLE ENGINES HAVE NOW BECOME VIRTUALLY EXTINCT IN THE GOLF CAR MARKET. THIS INDUSTRY INFORMATION SHOULD CLEARLY SHOW THE CARB BOARD THAT THE GOLF CAR MANUFACTURERS IN THE UNITED STATES HAVE TAKEN A PROACTIVE STANCE AT SUBSTANTIALLY REDUCING THE EMISSIONS OF GASOLINE POWERED GOLF CARS. THIS WAS DONE BASED ON THE UNDERSTANDING THAT WE WOULD HAVE THE OPPORTUNITY TO MEET A TIER I AND TIER II EMISSIONS REGULATION SIMILAR TO THE LAWN AND GARDEN REGULATION.

I WOULD NOW LIKE TO TURN YOUR ATTENTION TO THE PRIMARY CONCERN OF THE NATIONAL GOLF CAR MANUFACTURERS ASSOCIATION AS IT RELATES TO THE PROPOSED REGULATION.

THE MOST HARROWING EFFECT OF THE REGULATION IS THE IMMEDIATE ADVERSE ECONOMIC IMPACT ON CALIFORNIA GOLF COURSE OPERATORS. BASED ON A 1993 NATIONAL CLUB ASSOCIATION CLUB OPERATION SURVEY, GOLF CAR REVENUES CONSTITUTES 4% OF ALL REVENUES OF THE AVERAGE PRIVATE GOLF CLUB IN THE WESTERN UNITED STATES.

BASED UPON AVERAGE PRIVATE GOLF AND COUNTRY CLUB REVENUES OF $5,031,000, THIS 4% OF REVENUES ATTRIBUTABLE TO GOLF CARS IS AN AVERAGE OF $201,240. CONVERSELY, GOLF CAR OPERATIONS REPRESENT 2% OF THE AVERAGE PROGRAM AND SUPPORT EXPENSE OF $4,721,000 YIELDING AN AVERAGE ANNUAL EXPENSE OF $94,420. THE ASSUMED AVERAGE OPERATING MARGIN THEREBY ATTRIBUTABLE TO THE TYPICAL GOLF CLUB IS $106,820. THIS AVERAGE 2% MARGIN WILL COME UNDER EXTREME PRESSURE WHEN CONVERTING TO AN ELECTRIC FLEET. IN A NATIONAL GOLF FOUNDATION PUBLISHED REPORT ON GOLF CAR ECONOMICS, THE STATED DIFFERENTIAL AND OPERATING COST BETWEEN ELECTRIC POWERED AND GASOLINE POWERED GOLF CARS IS $.88/ROUND.

IF A TYPICAL PRIVATE GOLF CLUB IN CALIFORNIA HAS A FLEET OF 64 GOLF CARS OPERATING AT THE ESTIMATED AVERAGE OF 417.4 AVERAGE ROUNDS PER YEAR, THIS WILL INCREASE OPERATING COST BY $23,508 REDUCING THE AVERAGE PROFIT OF $106,820, TO $83,312. THIS REPRESENTS A DECREASE IN MARGIN OF 22%.

IF WE USE THE SAME CALCULATION FOR ALL 14,000 GASOLINE POWERED GOLF CARS IN THE STATE OF CALIFORNIA, THIS WOULD REPRESENT AN INCREASE IN OPERATIONAL EXPENSE TO CALIFORNIA GOLF COURSES OF $5,142,368. IF THE CALIFORNIA GASOLINE GOLF CAR POPULATION IS 40,000 UNITS AS ESTIMATED BY CARB, THE ADDITIONAL OPERATING EXPENSE ANNUALLY FOR CALIFORNIA GOLF COURSES IS $14,692,480. THIS IS A SIGNIFICANT NEVER-ENDING FINANCIAL IMPACT ON THE CALIFORNIA GOLF INDUSTRY.

THIS MONETARY CONTRIBUTION IS IN JEOPARDY AND CAPITAL EXPENDITURES BECOME SIGNIFICANT, WHEN ONE CONSIDERS THAT ELECTRIC GOLF CARS SHOULD NOT BE STORED BESIDE GASOLINE GOLF CARS BECAUSE OF FIRE HAZARD CONSIDERATIONS. THUS, TO BUILD A NEW, OR MODIFY AN EXISTING GOLF CAR FACILITY TO ACCOMMODATE RECHARGING ELECTRIC GOLF CARS AND BUY OR ALLOCATE PROPERTY ON WHICH TO PLACE THE STORAGE FACILITY (WHICH MAY BE AT A PREMIUM NEAR THE GOLF COURSE), WILL COST THE AVERAGE GOLF COURSE OPERATOR BETWEEN $300,000 AND $1,000,000, OR BETWEEN $63,600,000, AND $341,000,000 IN AGGREGATE CAPITAL EXPENDITURES FOR THE GOLF COURSE INDUSTRY IN CALIFORNIA. HOW IRONIC INDEED IF ENVIRONMENTALLY FRIENDLY GOLF COURSES ARE RUN OUT OF BUSINESS BECAUSE OF AN ILL CONCEIVED REGULATION ONLY TO BE REPLACED BY LESS ENVIRONMENTALLY FRIENDLY COMMERCIAL ACTIVITIES.

THE NATIONAL GOLF CAR MANUFACTURERS ASSOCIATION HAS SUBMITTED MANY WRITTEN DOCUMENTS TO CARB IN THE LAST FEW YEARS RELATIVE TO THIS SUBJECT, AND THIS ORAL PRESENTATION IS NOT INTENDED TO SUPERSEDE ANY OF THOSE POSITIONS OR COMMENTS. IT WAS NOT MY INTENTION TODAY, TO COVER EVERY DETAIL OF OUR COMMUNICATIONS WITH CARB, BUT TO RESTATE OUR OVERALL POSITION, AS AN INDUSTRY, AND THE BASIC REASON FOR THAT POSITION.

THANK YOU FOR YOUR TIME AND ATTENTION. I WILL BE DELIGHTED TO ANSWER ANY QUESTIONS THAT THE BOARD OR STAFF MAY HAVE.

National Golf Car Manufacturers Association
Two Ravinia Drive
Suite 810
Atlanta, GA 30346
(404) 394-7200
Fax (404) 395-7888

94-1-1
1/13/94
Late Submittal
TAC
MSD
Legal

January 25, 1994

EXPRESS MAIL
RETURN RECEIPT REQUESTED

Board Secretary
Air Resources Board
2020 L Street
Sacramento, California 95814

Re: Public Hearing to Consider the Adoption of Emission Control Regulations for Off-Highway Recreational Vehicles and Engines: ARB Mail Out #93-54; Our File No. 4786.870125

Dear Sir or Madam:

This letter is a request for reconsideration of the resolution offered by Mr. John Lagarias, Air Resources Board member, Le., to allow golf cars to meet lawn and garden Tier One emission standards.

It has come to our attention that in voting on Mr. Lagarias' motion concerning the Tier One application to golf cars, the Board may not have understood the National Golf Car Manufacturers Association members are also willing to meet lawn and garden Tier Two standards, Le., zero emissions, when the Tier Two standards become effective. This position is consistent with our position statement dated August 3, 1993, addressed to ARB.

Further, the Air Resources Board members may not have understood that National Golf Car Manufacturers Association members are willing to meet the stringent Tier One and Tier Two standards as promulgated for lawn and garden and not some less stringent standard. Such a proposal will not restrict technology advancement using alternate fuels.

Because modifications are pending to the regulations as required by other resolutions approved by the ARB at its January 13, 1994 hearing, and some ARB members were unable to be present at the hearing due to inclement weather, we further request (i) a rehearing on the issue of allowing golf cars to meet lawn and garden Tier One and Tier Two emission standards, and (ii) the modifications we recommended to ARB staff by our letter addressed to Mr Michael Carter dated November 18, 1993 (copy enclosed) be favorably considered for inclusion in the other pending modifications.

We appreciate the courtesies extended to us during our appearance and the opportunity to appear before the Board.

Thank you.

Sincerely,

**NATIONAL GOLF CAR MANUFACTURERS ASSOCIATION**

Charles A. Fain
Chairman, Engineering Committee

CAF/vt

cc: NGCMA Board of Directors
Mr. Fred L. Somers, Jr., Esquire
Ms. Jackie Lourenco, Manager, Off-Highway Road Control Section, Mobile Source Division, Air Resources Board

NGCMA National Golf Car Manufacturers Association

Two Ravinia Drive
Suite 310
Atlanta, GA 30346
(404) 394-7200
Fax (404) 395-7698

November 18, 1993

VIA FACSIMILE: (818)575-6800

Mr. Michael Carter
Chief
Off-Road Control Regulations Branch
Air Resources Board
Haagen-Smit Laboratory
9528 Telstar Avenue
El Monte, California 91731

RE: Your Mailout Z-93-92
NGCMA/CARB
Our File No. 4786.870125

Dear Mr. Carter:

Thank you for forwarding to us a copy of the preliminary draft Off-Highway Recreational Vehicle Regulatory package for our review and comments.

The following paragraph references correspond to the paragraph references of the various attachments you enclosed.

Attachment 1.

Article 2.- correct "Off-Highwaay" to "Off-Highway."

§ 2410(a)(1) - In the third line, insert the word "new" between "other" and "off-highway." While you have used the word "new" preceding "specialty vehicle engines" in the first line of this section, it is not clear that the word "new" also applies to "all other off-highway recreational vehicles" as we assume to be the case.

§ 2411.(a)(13) - The definition you have postulated for "golf cart" does not comply with either the American National Standards Institute Safety Standard Z130.1 nor California Vehicle Code § 345. Further, we are mystified as to the origin of the second sentence which recites, inter alia, "Golf carts are designed to carry not more than 100 lbs., excluding passengers...." Most golf cars are designed to carry two golf bags and in some instances with a bag attachment are capable of carrying up to four golf bags. The weight of these golf bags may well exceed 100 lbs.

We submit it is most important from a safety viewpoint to include in the definition the phrase "designed to be and is operated at not more than 15 miles per hour" as is contained in the California Motor Vehicle Code § 345 definition and in the ANSI Z-130.1 definition.

§ 2411(a)(15) - While you have carefully defined "Off-Highway Recreational Vehicle Engines" we do not find a definition for the term "Recreational Vehicles." Nor do we find a definition for this term in the "Words and Phrases" section of the California Vehicle Code, nor in the definition section of Section 1900(b) of the California Code of Regulations. We submit that a definition of "Recreational Vehicles" would be most helpful to clarify the proposed regulations and their applicability to various types of vehicles otherwise defined in the California Vehicle Code or as commonly thought of as "recreational vehicles" but which may not be intended to be included within the meaning of the proposed regulations.

§ 2411(a)(16) - The definition of "Off-Highway Road Vehicle" recites, inter alia, that it is "used primarily used off the highways...." As you are undoubtedly aware, California has adopted pilot program legislation providing for the use of golf cars on highways subject to various restrictions. See Assembly Bill No. 1229 adding a new Chapter 5 to Division 2.5 of the California Streets and Highways Code. While we recognize that this pilot legislation is merely that, it is our understanding the state of California intends for this pilot legislation to be subsequently amplified if the pilot program proves successful.

Accordingly, we question whether the phrase "used primarily" as it might relate to golf cars being "used primarily" for personal transportation utilizing local streets and highways is appropriate. You may want to consider in place of the phrase "used primarily" the phrase "used or designed for use." This will make it clear that golf cars, regardless of their ultimate use, are to be regulated as off-highway vehicles and not as on-highway vehicles or not regulated at all.

Alternatively, you could utilize the same language you postulate under subsection (19) with respect to "specialty vehicles." That is, "specialty vehicles" are mainly used off of highways and residential streets. [Emphasis added.]
We don't mean to quibble between the words "primarily" and "mainly" but we do think there is a difference. For example, if X golf cars are manufactured annually and 10% of the manufactured golf cars are used primarily for transportation purposes on public streets and highways but 90% are used on golf courses, then the golf cars might be thought to be "mainly used off of highways and residential streets." However, if golf cars are "used primarily off the highways," then we construe this phrase to be that 100% of X cars manufactured are used primarily off the highways, which we submit may not be accurate.

§ 2411(19) - The definition of "specialty vehicles" more or less tracks the definition of "golf cart" in the California Vehicle Code, with the exception that the unladen weight and speed has been increased. We submit the definition is ambiguous inasmuch as it speaks in terms of generalities and not defined limits.

§ 2411(a)(20) - Would the definition of "Ultimate Purchaser" include a fleet operator who is in the business of leasing golf car fleets on a spot basis to golf courses for temporary use in tournaments?

§ 2412 - Should the title of this section not be revised to recite "Emission Standards and Test Procedures - 'Specialty and' New Off-Highway Recreational Vehicles and Engines"?

§ 2412(b) - We note the standards do not include golf cars in federal ozone attainment areas. Does this mean that golf cars are not to be regulated by ARB in attainment areas but will be only subject to EPA regulations when and as issued?

§ 2412(c) - Should not the word "new" be inserted preceding the words "golf carts" in the third line? This would clarify that the modifier "new" in the second line applies to not only off-road motorcycles but also to golf cars.

Footnote 6 recites that golf cart manufacturers are not required to perform emissions testing. However, Attachment 3, § 86.408-78(b), appears to state to the contrary. (See page 6).

§ 2413, dealing with emission controls labels, specifically references off-road motorcycles, all terrain vehicles and < 25 hp specialty vehicles but does not reference golf cars. Does this mean golf cars are excluded from the labeling requirements?

**Attachment 2.**

No comment.

**Attachment 3.**

We have the same difficulties with the definition of "Golf Cart" as set forth above under Attachment 1 and with the definition of "Specialty Vehicles" as set forth in our comments above.

§ 86.408-78(b) - If a golf car manufacturer does not manufacture its own engines and the engine manufacturers are themselves required to test the engines, we see no reason why the golf car vehicle manufacturer should be required to test the engine as obviously recognized by your staff in Footnote 6 to Attachment 1. (See page 6). Also, if electric, no testing should be required.

§ 86.416-80(b)(4) includes reporting "projected number of vehicles produced and delivered for sale or use in California, and projected California sales." We are uncertain as to what confidentiality attaches to the information submitted and the accessibility of such information despite confidential submissions. The golf car industry manufacturers are most protective of their individual production statistics and have a legal right to their protection. What assurances can ARB give with respect to not disclosing this information to third parties, including other golf car manufacturers?

§ 86.416-80(b)(6) requires the owners manual be submitted for approval by ARB to include the "safety and refueling/recharging information as required by the subsections above." Is this a reference to CFR 86.411-78, or, if not, to what other "information" is this reference applicable?

We very much appreciate the opportunity to comment on the preliminary draft of these proposed regulations. We commend ARB staff in its efforts to realize a useful and precise regulatory scheme and in affording the golf car industry an opportunity for input.

Sincerely,

NATIONAL GOLF CAR MANUFACTURERS ASSOCIATION

Fred L. Somers, Jr.
Secretary/Treasurer and
General Counsel

FLS/mfw
carb.n15

FACSIMILE MESSAGE

STATE OF CALIFORNIA
AIR RESOURCES BOARD
2020 L STREET
SACRAMENTO CA 95814
FAX: (916) 323-0764

7 PAGES TO FOLLOW

PLEASE DELIVER ASAP TO: Jackie Lourenco

FROM: Wendy Pendleton / Pat Hutchens
Board Secretary's Office
CALIFORNIA AIR RESOURCES BOARD

COMMENTS: Late Submittal Comment Letter from 1/13/94 Bd. MTG

ANY PROBLEMS IN RECEIVING THIS MESSAGE SHOULD BE REPORTED TO

CONTACT PERSON: Wendy Pendleton

TELEPHONE: (916) 322 - 5594

EXECUTIVE OFFICE

3

MOTORCYCLE INDUSTRY COUNCIL, INC. 2 Jenner Street, Suite 150, Irvine, CA 92718-3812 · (714) 727-4211 · FAX (714) 727-4217

# MIC PRESENTATION FOR JANUARY 13, 1994 AIR RESOURCES BOARD HEARING TO CONSIDER A PLAN TO CONTROL EMISSIONS FROM OFF-HIGHWAY VEHICLE ENGINES

My name is J.C. DeLaney. I am the Director, Technical Programs for the Motorcycle Industry Council. We are a nonprofit national trade association representing one hundred twenty-five manufacturers and distributors of motorcycles, ATVs, motorcycle and ATV parts and accessories, and members of allied trades.

## INDUSTRY IS WILLING TO WORK WITH CARB.

Firstly, I want to assure the Board, and staff that our member Motorcycle and ATV manufacturers continue in their willingness to work with the Air Resources Board in the development of mutually acceptable regulations.

Several workshops between CARB & Industry have already been held, and we look forward to continuing this dialog. MIC does, however, still have several areas of disagreement with the proposed regulations:

## ALTERNATIVE CERTIFICATION TESTING OF ATVS

The proposed regulations allow certification of ATVs using the ULG test procedures "to equivalent standards." Due to the different engine loading characteristics between the two test procedures, preliminary testing by manufacturers has shown no true correlation between them. Some manufacturers have also indicated that there are 'repeatability' problems when using the Federal Test Procedure. For these reasons, rather than attempting to show equivalency, MIC advocates the development of specific standards for ATVs, using the steady state (SAE J1088) test procedure. Again, MIC member companies are willing to work with CARB staff in the mutual development of acceptable standards.

## DELAY/EXEMPTION FOR ≤90 cc OFRMS & ATVS

MIC strongly feels that OfRMs and ATVs with engine displacements <50 cc should be exempted from regulation. These small displacement machines are currently exempt from on-highway emissions rules, and MIC feels that this should also be the case for off-road. Because of the very small size and light weight of most of these machines, fitting them with larger, emission controlled engines is not practical. Additionally, many, if not most, of the

<50 cc OfRMs cannot attain even the modest speeds required by the Class One Federal Test Procedure. These machines are, for the most part, intended for use by children who are learning to ride, and are typically operated at slow speeds on level ground. It is important that these small entry level motorcycles and ATVs be light weight, easily handled, and economically priced.

Further, extending the compliance date for OfRMs and ATVs with engines ≤90 cc until December 31, 1999 will allow manufacturers to develop small, light weight emission controlled motorcycles and ATVs with adequate performance capabilities for use by youngsters learning to ride and small adults who would be uncomfortable on the bigger machines.

Until March, 1993, industry had relied on CARB staff's indication that these small motorcycles and ATVs would be exempt from emission requirements. Consequently, virtually no development of alternative power sources for them has been done yet. Many of these OfRMs and ATVs use the engine as a chassis structural member, and redesign/redevelopment will entail a complete re-engineering of engine, frame, or both to incorporate a new, emission controlled, engine.

These machines are important in that they are typically the machines that introduce new users to the sport, thus perpetuating the market for the larger machines. Extending the compliance date for machines with engines ≤90 cc will allow manufacturers the necessary lead time to develop the new, emission controlled engines.

It should be noted that under the requirements of a Consent Decree signed by the ATV manufacturer/distributors and the U.S. Consumer Product Safety Commission (*United States District Court, District of Columbia, Civil Action No. 87-3525 GAG*), ATV manufacturer/distributors are precluded from marketing ATVs with engines larger than 90 cc for use by children under 16 years old. Children under 12 years of age may only ride ATVs with engines under 70 cc. Since many, if not most, entry level riders fall into these age groups, this segment of the market is important, as is providing them with machines of adequate performance to allow the learning of skills required to transition to the larger machines.

## DEFINITIONS

CARB staff has defined competition vehicles as those "...used exclusively for competition..." while MIC's member companies manufacture and market motorcycles for exclusive competition use, they have no control over their actual usage by the ultimate purchaser. MIC continues to object to any definition based on a vehicle's use. Competition vehicles should be defined as those "...manufactured and marketed exclusively for closed course competition..."

Also, the definitions for both ATV and Off-Road motorcycle include a sentence to the effect that an ATV or OfRM that is not used exclusively for competition is not defined as a competition vehicle. This is unnecessary. Since a competition vehicle definition is included

in the proposed regulations, there is no need to define what is not a competition vehicle.

MIC understands that CARB will use the American National Standards Institute (ANSI) definition for ATVs, but we object to staff's addition of load weight limits. We feel that such limits may prove design restrictive as the larger ATVs are already near the load carrying capacity in CARB staff's definition. MIC understands that staff's intention in adding the load limits was to preclude redefinition of specialty vehicles as ATVs. The very design specific aspects of the ANSI definition - astride seating, four wheels (only), and handlebar steering - make this very unlikely. Certainly no currently marketed specialty vehicles meet these criteria.

## VEHICLE IDENTIFICATION NUMBERS

During previous workshops, it has been agreed that the Air Resources Board, with Department of Motor Vehicles (DMV) cooperation, should initiate a system to preclude registration for recreational use (Green Sticker) of motorcycles intended for closed course, competition use. Preventing closed course machine registration for recreational use would effectively remove a significant number of currently manufactured 2 stroke off-highway motorcycles from eligibility for registration. This would have the effect of removing the most significant emission contributors from eligibility for registration.

In view of the smaller number of actual models of competition motorcycles and ATVs, and their lower sales volume - a volume that is anticipated to decline significantly once regulations are effective - it is more cost effective for industry to code the Vehicle Identification Numbers of competition machines, rather than recreational OfRMs and ATVs as proposed in the mail-out. The end result will be the same. It will achieve CARB staff's goal of precluding registration of competition motorcycles and ATVs for recreational use in California. An additional benefit of VIN coding only competition motorcycles is that it will preclude any confusion that might be caused at the DMV for an owner who wants to register a dual sport (useable on OR off highway) motorcycle exclusively for off-road use.

## CERTIFICATION TESTING

The proposed regulations require that all vehicles undergo a minimum of two tests for certification. MIC questions the need for this, since other equipment classifications, including on-highway vehicles, require only one test. The additional testing costs and time requirements are an unnecessary burden to the manufacturers, and will serve no useful purpose.

## REPORTING REQUIREMENTS

MIC continues to object to any reporting of competition vehicle sales. As specified in the California Health and Safety Code, CARB has no authority to regulate competition (racing) vehicles, and therefore should not require reporting of sales for them.. Further, the

provisions of the proposed regulations, which MIC agrees with, provide a means for precluding their registration for recreational use. Making their registration for recreational usage illegal should also negate any need for reporting of sales.

## SUMMARY

Again, I want to assure the Board, as well as CARB staff that our member Motorcycle and ATV manufacturers continue in their willingness to work with the Air Resources Board in the development of mutually acceptable regulations.

# *Comments of Honda Motor Co., Ltd. regarding the proposed Exhaust Emission Standards and Test Procedures for Off-Highway Recreational Vehicles and Engines*

*January 13, 1994*

We appreciate the opportunity to comment on this proposed rulemaking. We support the comments of the Motorcycle Industry Council. We would like to thank the staff for their efforts during the development of the proposal.

Our data show that approximately 21,500 off-road motorcycles and ATVs were sold in California in 1992. About half of these were equipped with 2-stroke engines. Approximately 1300 motorcycles with engines of less than 50cc were sold and about 1000 motorcycles and 920 ATVs with engines of larger than 50cc and less than 90cc. The rest were larger displacement motorcycles and ATVs and vehicles manufactured for use in competition.

From these numbers it is clear that this source is not a major contribution to air pollution. The main effectiveness of this proposal would be from the elimination of 2-stroke engined vehicles, as was the case with the on-road regulation.

The following are our specific comments on the proposal.

1. *Optional Standards for ATVs*

   Honda needs the option to use the test procedure for utility and lawn and garden equipment engines (SAE J1088) for certifying our ATV engines. Our facility for testing according to the FTP has been optimized for 2-wheeled motorcycles and cannot accommodate an ATV even if one rear wheel is removed.

In the proposal, engines tested under the SAE J1088 procedure must comply with exhaust emission standards equivalent to the standard for vehicles tested under the FTP. No explanation of how this equivalency will be determined has been provided in the proposal and our understanding is rather vague. However, as we understand it, the proposal seems to be impractical and might result in different manufacturers certifying to different standards for the same category of vehicle.

We very strongly believe that ARB must adopt a single specific numerical standard as has been done for all other mobile sources controlled by the ARB for these engines tested according to this procedure. We propose the following standards:

For engines of less than 225cc displacement:

| | |
|---|---|
| CO | 300 gms per bhp/hour |
| HC plus NOx | 12 gms per bhp/hour |

For engines of 225cc and greater displacement:

| | |
|---|---|
| CO | 300 gms per bhp/hour |
| HC plus NOx | 10 gms per bhp/hour |

2. *Exemptions*

We do not agree with the ARB staff that exemptions are unnecessary or that they will undermine the regulations. We believe that off-road motorcycles should not be treated more severely than on-road, therefore we request that exemption should be granted for motorcycles with engines of less than 50cc displacement as is allowed for on-road motorcycles. Also, we ask the Board to allow an exemption for vehicles with engines of less than 90cc displacement until the year 2000. This will allow manufacturers time to develop replacement products for this category.

These small displacement vehicles represent the means by which manufacturers introduce new riders to the sport. They accumulate less miles per year while being used on fewer days per year than larger displacement enthusiast machines so their contribution will not be great.

3. *Useful Life*

The proposed 5 years or 10,000 kilometers useful life is too much for this type of product. It is similar to the useful life requirement adopted for on-road motorcycles but it is not appropriate for vehicles used off-road.

This is because the conditions of use for on-road vehicles are relatively stable and those for off-road use are highly diversified. The operation of a vehicle in traffic results in a degree of similarity in vehicle speed, acceleration, etc., while off-road use has no similar limits. Additionally, a certain level of operator performance is implied for on-road driving which is absent in off-road use.

These differences in usage mean that it is impossible for the manufacturer to guarantee the performance of the product used off-road to the same degree as he can for the product used on-road, even if they are manufactured to the same specifications. Also, we believe that vehicle usage will vary according to the enthusiasm of the owner and will decrease year by year.

Therefore we propose that useful life be defined as follows:

| | | |
|---|---|---|
| . 280cc or greater | 2 years/ 4000km | 200 hours |
| . 170cc to 279cc | 2 years/ 2400km | 200 hours |
| . 91cc to 169cc | 2 years/ 1600km | 200 hours |

4. *Emission Testing*

Staff has proposed a requirement for each vehicle or engine to be tested twice for certification. This is not required for any other class of vehicles or engines controlled by ARB, and it is not necessary for this class. There is no emissions benefit from the additional testing burden. All it does is to increase costs and reduce test facility availability.

We request that the Board change this to require only one certification test.

5. *ATV Definition*

A payload limit is not appropriate for these vehicles. Honda believes that this is design restrictive. The load capacity does not matter as long as the standards are met. There should be no limit of the load capacity of these vehicles.

We think that the definition should follow the American National Standard Institute's definition which reads as follows:

- All Terrain Vehicle (ATV) - Any motorized off-highway vehicle 50 inches (1270mm) or less in overall width, with an unladen dry weight of 600 pounds (275 kg) or less, 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. Width and weight shall be exclusive of accessories and optional equipment.

6. *Competition/Racing Vehicles Definition*

The U.S. EPA has defined Competition/Racing Vehicles and their definition which reads: "any off-road motorcycle or ATV designed and marketed solely for use in closed course competition events." is appropriate for this category of vehicles.

7. *Off-Road Motorcycle Definition*

The definition of an off-road motorcycle should be consistent with the existing California Vehicle Code definition which reads as follows:

"Off Road Motorcycle: Any vehicle as described in the California Motor Vehicle Code, §400 having an internal combustion engine and which is not primarily designed for use on freeways, highways, and surfaced streets".

Additionally the staff's definition of an "Off-Road Motorcycle" and "All-Terrain Vehicle includes the sentence "An Off-Road Motorcycle/ATV that is not used exclusively in competition/racing events in a closed course is not a competition/racing vehicle for the purposes of these regulations." The use of these products can not be controlled by the manufacturer. This sentence should be deleted from the regulation.

8. *VIN Definition*

The definition of a "Vehicle Identification Number (VIN)" incorporates several parts of 49CFR. Part 567 contains the NHTSA certification requirements which include specific labeling requirements. We believe that these may have been incorporated by mistake. CARB needs only require a specific means of preventing the licensing of competition vehicles. We suggest that a specific requirement be adopted to identify the non-compliant competition OFRMs and ATVs, not the complying vehicles. This will be more economical since there are less models to change and will have the same effect.

9. *Corporate Average*

The standards should be applied as a corporate average regardless of which test procedure is used to determine compliance. CARB should allow a corporate average of the vehicles tested on the FTP and of the vehicles tested using the J1088 test procedure. For the latter the HC plus NOx values shall be averaged.

10. *Total Test Distance*

Total test distance is defined as the distance the vehicle should be driven to stabilize emissions. We request that ARB add the words, "as determined by the manufacturer" to clarify the responsibility.

11. *Reporting Sales of Competition Vehicles*

The staff report indicates that "True competition off-road motorcycles, ATVs, and go-karts are exempt from these standards." These vehicles are exempt and reporting should not be required. This reporting would provide no emissions benefit but would cause manufacturers and ARB staff additional workload. We recommend that this proposal be deleted.

12. *Cost Effectiveness*

Staff estimates the cost of improvements to meet the proposed standards for off-road motorcycles as approximately $25 per engine. This is fairly close for small engines, however we estimate an increase of $150 at retail for larger engines which need air injection.

The staff's estimate of annual miles driven does not consider the differences in performance and terrain which will limit average speed to well under 20 mph for small displacement vehicles. Also, the number of days used per year and the mileage accumulated will decrease year by year as with other classes of vehicles, so it is not reasonable to simply multiply the numbers.

These factors result in a decrease in the cost effectiveness of this proposal which could be offset to some degree by the changes recommended above.

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State of California
Business, Transportation and Housing Agency

Department of Motor Vehicles

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1/13/94

# Memorandum

**Date** : January 11, 1994

**To** : Board Secretary
Air Resources Board
P. O. Box 2815
Sacramento, CA 95812

**From** : **Department of Motor Vehicles**
2415 First Avenue
Sacramento, CA 95818

**Subject** : **Proposed Emission Control Regulations for Off-Highway Recreational Vehicles and Engines**

These comments are in response to the Board's regulatory proposal concerning off-highway recreational vehicles.

It is our understanding that through new certification, labeling, and registration procedures, the proposal will:

- Limit the exhaust emissions from (non-competitive) off-road motorcycles and all-terrain vehicles.
- Control the improper use of off-road motorcycles and all-terrain vehicles, that are ostensibly designed for competition.

It is further understood that the manufacturers would be required to encode the vehicle identification number in a manner which identifies the vehicle as a California certified off-road vehicle. This identification would provide the department with the necessary information to properly register the vehicle. Additionally, this identification would limit the number of competition vehicles that are inadvertently registered each year as non-competition vehicles.

Off-highway vehicles are issued one of two types of indicia:

- Off-highway identification plate
- Motorcycle transportation permit

To register an off-highway vehicle and issue an off-highway identification plate, the department requires the following:

- A New Dealer Report of Sale. Both frame and engine numbers must be shown for motorcycles and all-terrain vehicles.

or

The Manufacturer's Certificate of Origin (MCO) or Manufacturer's Statement of Origin (MSO) endorsed to the unlicensed dealer or the original or certified copy of the Factory Invoice to the unlicensed dealer.

A Bill of Sale from the nonlicensed dealer to the applicant (unless the MCO or MSO is endorsed to the applicant). If the Statement of Origin is endorsed to anyone other than the applicant, Bills of Sale must be submitted to complete the chain of ownership to the applicant.

or

A "business" invoice with the name and address of a California nondealer.

or

Usual nonresident documents for issuance of ownership or nontitle registration.

- Application for Registration (REG. 343) completed and signed (not required with a Dealer Report of Sale).

- A Statement of Facts (REG 256) may be accepted in lieu of MCO or Factory Invoice if the vehicle is valued at $2,000 or less as determined by the purchase price or value stated on the reverse of the application for registration. A motor vehicle bond and Statement of Facts are required if proof of ownership cannot be furnished for a vehicle valued over $2,000.

- **Verification of Vehicle.**

A Motorcycle Transportation Permit is issued for the purpose of transporting a racing motorcycle to and from racing events. The requirements for issuance are:

- Application for Special Motorcycle Transportation Permit (REG 712)

- Vehicle Identification Number

Evidence of ownership or vehicle verification is not required to purchase a permit.

To meet the requirements of the proposed regulations, as they affect the registration of off-road motorcycles, would require the department to establish procedures to:

- Require a physical inspection of the emission label on all applications for an off-highway identification plate without a Dealer Report of Sale.
- Identify California certified vehicles by the encoded vehicle identification number (VIN), the 12th character in the VIN being an "N", on the Dealer Report of Sale and other title documents.
- Establish a refund policy for those vehicles identified as not being California certified.

This regulation may impact the department's customer service at the time of initial registration (talk time explaining to the customer the new regulation). It is anticipated the impact will be minimal, and that the Board will have the ultimate responsibility of customer awareness.

Staff will coordinate the implementation of the registration procedures in conjunction with the effective date of the proposed regulations, and determine any interagency agreement impact.

If you have any questions, please contact staff member Maria M. Barajas, Vehicle Registration Policy Development, at (916) 657-8705.

Carole Bedwell
CAROLE WAGGONER BEDWELL, Chief
Program and Policy Administration

94-1-1
1/13/94

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**Statement**
**of the**
**Manufacturers of Emission Controls Association**
**on the**
**Air Resources Board's**
**Proposed Emission Control Regulations for Off-Highway Recreational Vehicles and Engines**

***January 13, 1994***

The Manufacturers of Emission Controls Association (MECA) is pleased to present written testimony in support of the Air Resources Board's proposed emission control regulations for off-highway recreational vehicles and engines. We wish to commend the Board and staff for their continuing efforts to develop and implement effective programs to reduce emissions from off-highway vehicles and engines.

MECA is a non-profit association of companies that manufacture various motor vehicle emission controls. Our membership includes companies with extensive experience in developing and manufacturing control technology such as the catalytic converter. Currently, these companies are developing and producing control technologies for a variety of off-road vehicles and engines.

Catalyst technology, which has a proven track record in highway motor vehicle application over the past 20 years, is an available control option for a number of the off-highway vehicles and engines covered by the proposed regulations. This technology, which can reduce exhaust emissions by up to 90% or more, not only lowers atmospheric pollution but also provides a cleaner "local breathing environment" for the operator of the recreational equipment.

**Off-Road Motorcycles and ATVs --** We concur with the ARB Staff's assessment that catalyst technology could be applied to two-stroke off-road motorcycles and ATVs to assist in meeting the proposed standards. Indeed, catalysts are currently being utilized on two-stroke on-highway motorcycles and mopeds in other parts of the world. While the operating environment of an off-road motorcycle can be more rigorous than highway operation, catalyst technology can be designed to withstand the more severe operating conditions.

The Staff in its Report notes that four-stroke motorcycles should be able achieve the required emission limits without the use of exhaust aftertreatment controls. We concur with this conclusion. Nevertheless, catalysts could readily be utilized on off-road, four-stroke motorcycles, if the manufacturers elected to apply this control strategy, to meet applicable standards.

**Specialty Vehicles Less than 25 Horsepower --** The Staff Report points out that specialty vehicles less than 25 horsepower are equipped with the same engines used in utility equipment. A number of our member companies are currently working with utility engine

manufacturers to optimize catalyst technology to help meet the utility engine emission standards previously adopted by the Board. We believe catalyst technology will be an available option for engines less than 25 horsepower used in off-road specialty vehicles.

**Specialty Vehicles and Go-Karts 25 Horsepower and Greater --** We concur with the ARB staff finding that control technology similar to that used in on-road engines such as the catalytic converter can be used on this class of off-road vehicles.

We hope our comments provided above are helpful to the Board in its consideration of the proposed emission regulations for off-highway recreational vehicles and engines.

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JB MSD

NGCMA National Golf Car Manufacturers Association

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Atlanta, GA 30346
(404) 394-7200
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# COMMENTS OF NATIONAL GOLF CAR MANUFACTURERS ASSOCIATION RELATING TO CALIFORNIA AIR RESOURCES BOARD MAIL OUT # 93-54 COMPRISED OF NOTICE OF PUBLIC HEARING TO CONSIDER THE ADOPTION OF EMISSION CONTROL REGULATIONS FOR OFF-HIGHWAY RECREATIONAL VEHICLES AND ENGINES, ACCOMPANYING STAFF REPORT AND PROPOSED REGULATION (ATTACHMENT 1)

## 1.0 Preamble.

The National Golf Car Manufacturers Association (NGCMA) is the national trade association comprised of original equipment manufacturers of golf cars manufactured and sold within the United States. Association members account for in excess of 95% of all golf cars manufactured and distributed within the state of California.

## 2.0 Background.

In December, 1990, the California Air Resources Board ("ARB") adopted regulations regarding exhaust emission standards for utility and lawn and garden equipment engines. The lawn and garden regulations were originally applicable to engines produced after December 31, 1993. Subsequently, the implementation of the engine regulations were delayed and are now proposed for implementation January 1, 1995. See ARB Mail Out 93-51. After that date, lawn and garden engines, e.g., riding lawn mowers, are required to comply with stringent exhaust emission (first tier) standards. These standards relate to hydro-carbon (HC) plus oxides of nitrogen ($NO_X$), Carbon Monoxide (CO) and particulate matter. No new lawn and garden engines are to be allowed to replace pre-1994 models after December 31, 1998. Thus, e.g., lawn mower manufacturers and consumers were given four full years of notice regarding the need to upgrade to cleaner engines, and eight full years to phase out pre-1994 units.[1]

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[1] *See Barclay's California Code of Regulations §2403.*

For several years, NGCMA has attempted to achieve similar treatment by ARB staff concerning gasoline-powered golf car regulation. In November 1991, NGCMA petitioned ARB to regulate golf cars by the same standards used for lawn and garden engine regulation. The premise behind this request was simple. Similar engines should be similarly regulated. Lawn and garden equipment utilize the same engines as golf cars, except that golf cars emit fewer pollutants over a comparable time period because they do not idle. Subsequently, ARB staff assured NGCMA golf cars would be entitled to meet first tier emission standards similar to lawn and garden requirements. Based on these assurances, the golf car industry spent in excess of $3,000,000 to research and develop gasoline-powered golf cars that would meet reduced emission standards, well aware that zero emissions standards were the ultimate ARB staff objective. However, abruptly, ARB staff recanted these assurances in August, 1992, originally proposing, by January 1, 1995, all golf cars operating in federal ozone non-attainment areas must be electrically powered.[2] Only after NGCMA filed its Position Statement dated August 3, 1993, strenuously objecting to this proposal, did ARB staff relent somewhat and revised the cut-off date to January 1, 1997.[3]

No additional time period is to be allowed for replacement engines as in the lawn and garden regulations. Thus, the ARB proposal gives California golf course and fleet operators of gasoline-powered golf cars less than thirty-six months to plan for and raise significant capital for conversion to battery-powered golf car fleets and construction of storage facilities in contrast to the eight years given landscapers and homeowners for lawn mowers for a substantially less significant capital outlay. Intensifying the problem, the underlying data allegedly supporting this proposal completely disregards extensive industry data and contradicts some EPA findings.

## 3.0 Primary Concerns.

The most harrowing effect of the regulation is the immediate adverse economic impact on California golf course operators. On a per course basis, the average golf course net revenue will be reduced by 8.5%, which leaves only 5.6% of net revenue remaining for capital expenditures.

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[2] *See proposed Regulation 86.410-90(b)(ii) [ARB Mail Out #93-38 Attachment 3, page 7]. Non-attainment areas account for an estimated 85% of California golf courses.*

[3] *See proposed Regulation 2412 [ARB Mail Out # 93-54 Attachment 1, page 7].*

Industry estimates revenue losses to be incurred by California golf course operators required to convert to all electric fleets will aggregate between $5,142,000 and $5,590,000 annually, depending on the type of course.[4] In addition, capital expenditures become significant considering that electric golf cars should not be stored with gasoline-powered golf cars because of fire hazard considerations. Thus, to build a new, or modify an existing, golf car barn to accommodate recharging electric golf cars and buy accompanying property on which to place the storage facility (which may be at a premium near the golf course), will cost the average golf course operator between $300,000 and $1,000,000, or between $63,600,000 and $341,000,000 in aggregate capital expenditures for the golf course industry in California. How ironic indeed if environmentally friendly golf courses are run out of business because of ill conceived regulations only to be replaced by less environmentally friendly commercial activity.

While the inequity behind this regulation is obvious, ARB staff has further disregarded numerous legal boundaries. For example, the California Health and Safety Code requires the establishment of uniform regulations that equitably distribute the reduction in emissions among various vehicle classes.[5] Not only are golf cars proposed not to be regulated in the same manner as other products which employ the same engine, but despite creating less than two-tenths of a percent of CO emissions and less than two one-hundredths of a percent of HC and $NO_X$ emission of all off-highway vehicles (OHV), golf cars must shoulder the near term hardship of complete elimination while most other off-highway vehicles are regulated more permissively.[6]

Other legal objections to the proposed regulation are set forth in the NGCMA 8/3/93 Position Statement incorporated herein by this express reference.

Despite NGCMA's avowed recognition of the importance of environmental protection, willingness to comply with stringent environmental standards, and history of working closely with ARB and EPA staff on issues of environmental regulation,

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[4] *See NGCMA 8/3/93 Position Statement, page 9.*

[5] *California Health and Safety Code §§ 43000 (c) and 43000.5 (c).*

[6] *See NGCMA 8/3/93 Position Statement, p.17 and Fred L. Somers, Jr. Letter to Ms. Jackie Lourenco dated 11/3/93 with enclosed (revised) Exhibit A to prior letter dated 3/26/93.*

the relevant data from the industry was ignored and the fair play of the administrative process was bypassed. ARB staff is apparently attempting to elbow these proposed regulations past the EPA Administrator and ARB itself by relying on undependable, inconsistent data to create mysteriously gerrymandered categories.

## 4.0 Specific Concerns.

The comments which follow are addressed to specific portions of Mail Out # 93-54. References to captions and page numbers correspond to the captions and page numbers of Mail Out # 93-54.

### NOTICE OF PUBLIC HEARING

Page 2, second paragraph under the caption "INFORMATIVE DIGEST OF PROPOSED ACTION" - The statement, "engines have been optimized primarily for performance rather than emissions," is false. Prior to now, the OEM small engine manufacturers have been addressing the need for compliance with the Utility Lawn and Garden emission standards already published. These same small engines are used in golf cars and specialty vehicles. Accordingly, the asserted optimization "primarily for performance rather than emissions" is disingenuous, particularly in the face of recent expenditures approximating $3,000,000 made by the golf car manufacturers themselves in connection with achieving cleaner engine and emission control.

Page 2, first paragraph under the caption "COST TO PUBLIC AGENCIES, etc." - The assertion that the "regulation will not create costs or savings... to any state agency...." may be false to the extent that any state parks or other state agencies utilize gasoline-powered golf cars. ARB staff admits that the operating costs (quoting NGCMA) for battery-driven cars are more expensive by $.62 per round than gasoline-powered cars. More recent estimates place the increased cost per round at 88¢ per round.[7] As noted above, this will cost California golf course operators an additional $5.1 to 5.6 million in operating costs and between $63 and 341 million in capital expenditures.

Page 3, first paragraph under the caption "COST TO PUBLIC AGENCIES, etc." - The finding "that the adoption of this regulation may have short term adverse

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[7] *See NGCMA 8/3/93 Position Statement, p.9.*

economic impact on California businesses (such as golf courses)" is misleading. There are obviously long-term adverse economic impacts when you consider the additional operating costs of a battery-driven car as opposed to a gasoline-driven car. Also, in accounting parlance, "short term" generally means one year as opposed to "long term" which means more than one year. The cost of a new golf car maintenance and storage facility will be required to be depreciated or amortized over a period well in excess of the short term, regardless of how "short term" is defined. Generally speaking, the IRS requires depreciation of real property improvements over a period of 19 years. This is hardly "short term"!

Page 3, second paragraph under the caption "COST TO PUBLIC AGENCIES, etc." - The invitation for proposals particularly as it relates to "the use of performance standards" rather than "prescriptive standards" is intriguing. Why are golf cars being treated differently than < 25 hp specialty vehicles when they utilize the same engines? Why particularly is this the case when the rationale for utilizing utility, lawn and garden standards for specialty vehicles is the very fact that specialty vehicles utilize the same engines as utility vehicles? NGCMA proposes golf cars (which also use the same engines as utility vehicles) be treated in all respects as "specialty" vehicles and be entitled to meet the same performance standards.

Most golf courses, especially daily fee courses, are small businesses.[8] Most courses employ both golf cars and specialty vehicles. Consolidation of the emission standards for these vehicles will simplify compliance requirements for these small businesses.

Page 3, third paragraph under the caption "COST TO PUBLIC AGENCIES, etc." - The requirement "the Board must determine that no alternative considered by the agency... would be as effective and less burdensome to affect private persons than the proposed action" constitutes a significant basis for the argument golf cars should be regulated as utility vehicles and not subjected to total eclipse. The NGCMA 8/93 Position Statement demonstrates the substantial burden to affected private golf course operators, which is much more economically detrimental than allowing them to continue using gasoline-driven cars meeting more stringent air quality standards.

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[8] *Median gross revenues for daily fee golf courses in Northern California in 1992 were $1,178,000 and for private courses, $1,416,000. Golf Course Operations and Maintenance Survey Report - Daily Fee Edition (National Golf Foundation August 1993) p.67 and - Private Edition (National Golf Foundation August 1993) p.60.*

STAFF REPORT

Page 1, second paragraph under the caption "INTRODUCTION" - In the eleventh line, the EPA emission control regulations for "certain preemptive farm and construction equipment" are referenced. However, no reference is made to the EPA sponsored Negotiated Rulemaking Advisory Committee agenda and mandated regulation of small non-road engines to include golf cars, anticipated to require golf car engines to comply with standards similar to California Utility, Lawn and Garden regulations.[9] This, NGCMA submits, is a significant and, hopefully, unintentional omission. ARB should be informed of the EPA small non-road engine FACA undertaking and the mischief ARB is creating if it adopts a standard for golf cars different from the likely EPA standard. It is known that New York and several other jurisdictions are looking at California and may well attempt to emulate California rather than wait for the EPA standard which is mandated by the Sierra Club settlement to be implemented in 1995.

Page 2, last two paragraphs under the caption "II. BACKGROUND" item B - Again, ARB staff is being disingenuous when it alludes to an alleged NGCMA reversal of position, but says nothing of its own reversal of position.[10] The Board is reminded that NGCMA's petition for classification of golf car engines as utility engines is still pending, has not been withdrawn and should be formally ruled upon before proceeding to consider this regulation.

Page 3, first full paragraph under the caption "II. BACKGROUND" - NGCMA's representatives' recollections of the 8/92 meeting are not that ARB staff "presented a proposal which would require zero emissions by 1/1/93," but that they merely postulated the possibility admittedly as a "posturing position" and invited NGCMA members to suggest reasons why such an early sunset would be non-feasible. Staff is apparently trying to show they graciously gave the golf car industry an additional four years, which NGCMA views as a cover-up for staff's abrupt change of position at the 8/6/92 meeting.

Page 3, under Item C, Table 1 - Again, staff ignores industry analysis showing there are only 14,000 not 40,000 gasoline golf cars, in California. Presumably, the 40,000 number is derived from the EPA study which estimated that total U.S. gasoline golf car population at 122,670. ARB postulates 40,000 gasoline golf cars,

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[9] *See 58 Federal Register 55033-55035 (10/25/93).*

[10] *See NGCMA 8/3/93 Position Statement, pp.3-4.*

thus, representing an incredible 33% of the total U.S. gasoline golf car population, whereas California's golf course census is only 6% of the U.S. golf course census. Industry estimates a total combined golf car fleet in California of gas and electric cars of 40,000.

Page 4, Table 2 - ARB staff continues to inflate the emissions even considering their use of a 40,000 gasoline golf car population. Using NGCMA calculations which it submitted to ARB[6], for example, the CO emissions would be 17.6 tons per day, not the 38.5 postulated by staff; HC would be .42 tons per day, not 2.5; and $NO_x$ would be .18, not .3 tons per day.

Further, the Table 2 emissions do not comport with the emissions previously claimed by K.D. Drachand in his Mail Out transmittal letter dated 3/11/93, which claimed 11.5 tons per day HC, and 82 tons per day CO. NGCMA refers the Board also to other ARB staff claimed emissions referenced in NGCMA's 8/3/93 Position Statement at page 7, which differ from Table 2. While ARB staff has, obviously, reduced its prior emission claims, they still are grossly inflated, the population of gasoline golf cars being closer to 14,000 than the 40,000 claimed. Apparently, ARB staff fails or refuses to recognize industry's significant efforts to achieve cleaner emissions and engine improvements.

Page 8, item 2, under the caption "IV. DISCUSSION, A. EMISSION STANDARDS" first paragraph, second sentence - "Starting in 1997, this requirement will apply to all new golf carts produced after December 31, 1996...." Does this mean that if you produce a golf car before December 31, that you can still distribute or sell it in California after December 31, 1996?

Page 10, under the caption "B. TECHNICAL FEASIBILITY" item 2, first paragraph - The assertion that most golf courses "have already, or soon will be, converted to an all electric golf car fleet because of increasing pressure from golfers for cleaner and quieter vehicles..." disregards the fact that many small daily fee operators enjoy a significantly higher operating margin because of the lower cost of operating a gasoline-powered fleet, as opposed to a battery-operated fleet. NGCMA disputes the quoted assertion by ARB staff and challenges staff to produce tangible evidence in its support. It is non-sensical to assume golfers at a daily fee or municipal golf course have any leverage to force an expensive conversion to electric golf cars requiring the golf course owner to incur not only substantial capital outlay but also reduced operating margin. Also, current production model gasoline golf cars are sufficiently quiet so as to ensure elimination of undesirable engine noise at

private golf courses where member/users may indirectly have some influence on golf car selection.[11]

Page 10, item 2, second paragraph, under the caption "B. TECHNICAL FEASIBILITY" - NGCMA challenges the staff assertions concerning "new recharging technologies" and "improved charger/battery and motor/electronics combinations." There have been no significant changes in recent years that have dramatically affected the driving range of electric golf cars. The solid state controller to the motor is the only change made in recent years. While the solid state controller may assist with battery life, depending on manufacturer design, most manufacturers concur it is difficult to quantify. Also, NGCMA questions what is meant by "hilly" terrain as expressed by staff. It is well-established, that depending upon the number and steepness of slopes on a golf course, the electric golf car battery life may be severely or modestly reduced.

Page 11, item C.2., under the caption "LEAD TIME" - Staff asserts "golf car(t) manufacturers will need little or no lead time since compliance requires no new technology and complying electric golf car(t)s are already being produced." Staff's argument is also applicable to electric mowers, trimmers and almost all lawn and garden products. Why then, are these lawn and garden products being given the opportunity to comply with lst tier emission standards and golf cars are not? NGCMA submits the proposed treatment of golf cars vis-a-vis lawn and garden and utility vehicles is thus discriminatory and contrary to express legislative findings and declarations.[12] Why is there no mention of the need to amortize the investment in cleaner engines already made by a number of the manufacturers, at least two of whom are based in California?

Page 18, item B, under the caption "V. ISSUES OF CONTROVERSY" second paragraph - Staff asserts, inter alia, "...[G]olf courses would not be required to replace their entire fleet at one time. This would reduce the demand for large capital expenditures for buildings and equipment and amortize this cost over a much greater period of time." NGCMA submits this paragraph is based upon a false premise, i.e., it is safe to store gasoline cars with battery cars. The spark from a DC motor pulling high amperage at start up could be enough to ignite the gas vapors

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[11] *See article entitled "Road Test" 72 CLUB MANAGEMENT p.70 (Sept./Oct. 1993). However, even at member-owned, private golf clubs, the decision concerning what golf car to purchase or lease rests primarily with professional management. id. at p.74.*

[12] *See NGCMA 8/3/93 Position Statement, p.12.*

of a gasoline powered golf car. There are reported incidents, e.g., of vapors from stored gasoline in a garage being ignited when a gas water heater is ignited. Further, it is infeasible to construct a battery car storage and maintenance facility piecemeal. The staff position also ignores the savings in construction and installation and volume discount available if the conversion is done at one time as opposed to piecemeal.

Page 19, item B, under the caption "VI. REGULATORY ALTERNATIVES" - Staff asserts it "considered many alternative regulatory proposals for golf cars and specialty vehicles." NGCMA questions whether staff sufficiently addressed alternative fuel sources other than electric. Industry has established the feasibility of using propane or natural gas as a fuel source concomitant with a dramatic reduction of pollutant emissions. Should not CARB encourage innovative and practical solutions to a national health and environmental issue consistent with maintenance of a vigorous economy and protection of existing small business enterprises, i.e., California golf course operators?

Pages 22-23, item B, under the caption "VII. ENVIRONMENTAL IMPACT AND COST EFFECTIVENESS" - Staff persists in its assertion of fictional emissions. Staff asserts a totally fictional $100,000 capital investment for storage facilities and necessary wiring, notwithstanding NGCMA's prior admonition to staff in its 3/26/93 letter[13] expenditure could range between $300,000 and $400,000. Staff also unduly minimizes the increased operating costs and only alludes to a quoted .62 per round per car increase and ignores the .88 increase, which is the more recent number. On page 9 of its 8/3/93 Position Statement, NGCMA pointed out the collective annual increased operating expenses for all California golf course operations ranges between $5,000,000 and $9,000,000 and the aggregate, immediate capital expenditure was a minimum of $63,600,000.[14]

Page 23, Cost Effectiveness Calculations - These calculations again are based on the fictional $100,000 capital expenditure and not on the more likely $300,000 to $1,000,000 capital expenditure. Further, the emissions reductions are grossly overstated.

Page 23, item C, under the caption "SPECIALTY VEHICLES" - Staff estimates emission reductions for specialty vehicles and states: "Because the majority

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[13] *Fred L. Somers, Jr. 3/26/93 LT Jackie Lourenco, p.6.*

[14] *See NGCMA 8/3/93 Position Statement, p.9 and citations therein.*

of these vehicles utilize engines which are identical to those used in the previously regulated utility engine category, most of the design and engineering has already been successfully completed. In fact, a few utility engines under 25 horsepower, which may be used in these vehicles, have already been certified for sale." The same may be said for golf car engines but hasn't been said. Why not? Why are golf cars not being afforded the same opportunity to meet utility engine standards when they use the same engine? NGCMA submits singling out gasoline powered golf cars for extinction is arbitrary and capricious in violation of 42 U.S.C. § 7543(e).[15]

**ATTACHMENT 1.**

[The comments which follow were previously submitted to ARB staff by letter dated 11/18/93 in response to staff's request for review and comments to a preliminary draft. However, none of these comments were adopted in the final draft.]

Article 2. § 2410(a)(1) - In the third line, NGCMA recommends ARB insert the word "new" between "other" and "off-highway." While the drafter used the word "new" preceding "specialty vehicle engines" in the first line of this section, it is not clear that the word "new" also applies to "all other off-highway recreational vehicles" as we assume but don't know to be the case.

§ 2411.(a)(13) - The definition the drafter postulates for "golf cart" does not comply with the definitions in either American National Standards Institute Safety Standard for Golf Cars Z130.1 nor California Vehicle Code § 345. Further, NGCMA is mystified as to the origin of the second sentence which recites, inter alia, "Golf carts are designed to carry not more than 100 lbs., excluding passengers...." Most golf cars are designed to carry two golf bags and in some instances with a bag attachment are capable of carrying up to four golf bags. The weight of these golf bags may well exceed 100 lbs.

NGCMA submits it is most important from a safety viewpoint to include in the definition the phrase "designed to be and is operated at not more than 15 miles per hour" as is contained in the California Motor Vehicle Code § 345 definition and in the ANSI Z-130.1 definition.

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[15] *See NGCMA 8/3/93 Position Statement, pp.13 et seq.*

§ 2411(a)(15) - While the drafter carefully defines "Off-Highway Recreational Vehicle Engines" we do not find a definition for the term "Recreational Vehicles." Nor do we find a definition for this term in the "Words and Phrases" section of the California Vehicle Code, nor in the definition section of Section 1900(b) of the California Code of Regulations. We submit that a definition of "Recreational Vehicles" would be most helpful to clarify the proposed regulations and their applicability to various types of vehicles otherwise defined in the California Vehicle Code or as commonly thought of as "recreational vehicles" but which may not be intended to be included within the meaning of the proposed regulations.

§ 2411(a)(16) - The definition of "Off-Highway Road Vehicle" recites, inter alia, that it is "used primarily off the highways...." As ARB may be undoubtedly aware, California has adopted pilot program legislation providing for the use of golf cars on highways subject to various restrictions. See Assembly Bill No. 1229 adding a new Chapter 5 to Division 2.5 of the California Streets and Highways Code. While we recognize that this pilot legislation is merely that, it is our understanding the state of California intends for this pilot legislation to be subsequently amplified if the pilot program proves successful.

Accordingly, NGCMA questions whether the phrase "used primarily" as it might relate to golf cars being "used primarily" for personal transportation utilizing local streets and highways is appropriate. ARB may want to consider in place of the phrase "used primarily" the phrase "used or designed for use." This will make it clear that golf cars, regardless of their ultimate use, are to be regulated as off-highway vehicles and not as on-highway vehicles or not regulated at all. Alternatively, you could utilize the same language you postulate under subsection (19) with respect to "specialty vehicles." That is, "specialty vehicles" are mainly used off of highways and residential streets. [Emphasis added.]

§ 2411(19) - The definition of "specialty vehicles" more or less tracks the definition of "golf cart" in the California Vehicle Code, with the exception that the unladen weight and speed has been increased. We submit the definition is ambiguous inasmuch as it speaks in terms of generalities and not defined limits.

§ 2411(a)(20) - Would the definition of "Ultimate Purchaser" include a fleet operator who is in the business of leasing golf car fleets on a spot basis to golf courses for temporary use in tournaments?

§ 2412(b) - We note the standards do not include golf cars in federal ozone attainment areas. Does this mean that golf cars are not to be regulated by ARB in attainment areas but will be only subject to EPA regulations when and as issued?

Footnote 6 (page 7) recites that golf cart manufacturers are not required to perform emissions testing. However, Attachment 3, § 86.408-78(b), appears to state to the contrary. (See page 6).

**ATTACHMENT 2.**

No comments.

**ATTACHMENT 3.**

§ 86.402-78 - NGCMA has the same difficulties with the definition of "Golf Cart" as set forth above under ATTACHMENT 1 and with the definition of "Specialty Vehicles" as set forth in its comments above.

§ 86.408-78(b) - If a golf car manufacturer does not manufacture its own engines and the engine manufacturers are themselves required to test the engines, we see no reason why the golf car vehicle manufacturer should be required to test the engine as obviously recognized by your staff in Footnote 6 to Attachment 1. (See page 6). Also, if electric, no testing should be required.

§ 86.416-80(b)(4) includes reporting "projected number of vehicles produced and delivered for sale or use in California, and projected California sales (for new 1997 and subsequent model golf cars)." If only electric (zero emission) golf cars are to be sanctioned after January 1, 1997, what justification exists for requiring certification and reporting?

§ 86.416-80(b)(6) requires the owners manual be submitted for approval by ARB to include the "safety and refueling/recharging information as required by the subsections above." Is this a reference to CFR 86.411-78, or, if not, to what other "information" is this reference applicable?

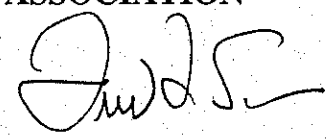
CONCLUSION

In summary, while NGCMA believes ARB staff to be well-intentioned in proposing this regulation, as it applies to golf cars, NGCMA also believes the

proposed regulation is fraught with false premises and a lack of comprehension of the basic economics of the golf car and golf course industries. NGCMA submits the appropriate regulatory response is to treat golf cars the same as specialty vehicles are treated under the proposed regulation. This would achieve parity and fairness among all vehicles using the same engines whether classified as recreational or utility, lawn and garden. In view of EPA's announced intention to adopt the California utility, lawn and garden standards for its pending small non-road engine categories, this recommendation would also assist in achieving regulatory uniformity.

Sincerely,

NATIONAL GOLF CAR MANUFACTURERS ASSOCIATION



Fred L. Somers, Jr.
Secretary/Treasurer and
General Counsel

FLS/mfw
ngc\comments.arb

cc: NGCMA Board of Directors
Mr. Jim Grinde
Mr. Chuck Fain
Ms. Jackie Lourenco
Mr. Michael Carter

NGCMA National Golf Car Manufacturers Association

Two Ravinia Drive
Suite 310
Atlanta, GA 30346
(404) 394-7200
Fax (404) 395-7698

December 30, 1993

**FEDERAL EXPRESS**
Board Secretary
Air Resources Board
2020 L Street
Sacramento, California 95814

RE: Public Hearing to consider the adoption of emission control regulations for off-highway recreational vehicles and engines: ARB Mail Out # 93-54; Our File No. 4786.870125

Dear Sir or Madam:

Enclosed find twenty copies of written statement to be filed with respect to the above-referenced matter on behalf of the undersigned Association.

In addition to the comments contained in the enclosed, written statement, it is anticipated Messrs. Charles A. Fain and James Grinde will present oral comments at the Hearing on behalf of the undersigned Association.

Thank you for the opportunity of presenting these comments.

Sincerely,

NATIONAL GOLF CAR MANUFACTURERS ASSOCIATION

Fred L. Somers, Jr.
Secretary/Treasurer and
General Counsel

FLS/mfw
ngc\arb.d28
cc: NGCMA Board of Directors
Mr. Charles A. Fain
Mr. James Grinde
Ms. Jackie Lourenco, Manager, Off-Highway
Road Control Section, Mobile Source Division
Air Resources Board
Mr. Michael Carter, Chief, Off-Highway
Road Control Regulations Branch, Air
Resources Board

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805 687-4410

Fred Rice
625 LAS PALMAS DRIVE · SANTA BARBARA, CALIF. 93110 · TELEPHONE 687-4410

964 7861

94-1-1
1/13/94

STATE OF CALIFORNIA
AIR RESOURCES BOARD
RECEIVED 1/7/94
BY BOARD SECRETARY
JS TAC
JB Legal
MSD

December 29, 1993

RECEIVED
DEC 31 1993
Office of the Chairwoman
Air Resources Board

California State Air Resources
P.O. Box 2815
Sacramento, CA 95812

Attn: Jacqueline Schafer, Chairwoman

→ TAC
Kaffont refer

Dear Ms. Schafer,

I am writing to urge that your committee exclude Avalon, Catalina Island, Los Angeles County, from phasing out gasoline-powered golf carts in Avalon.

I am a homeowner approximately one-half mile from the downtown area. It is virtually impossible to obtain permission to have an automobile on Catalina Island. Our only transportation in Avalon is by golf cart, duly licensed by the state for travel on Avalon streets.

Avalon has no problem with air contamination, nor is any anticipated, due to the limitations on construction and the prevailing wind conditions. Converting to electric power would be extremely difficult in our condominium project, which has over 200 dwelling units with no electric services to the cart parking areas.

Thank you for your consideration.

Yours truly,

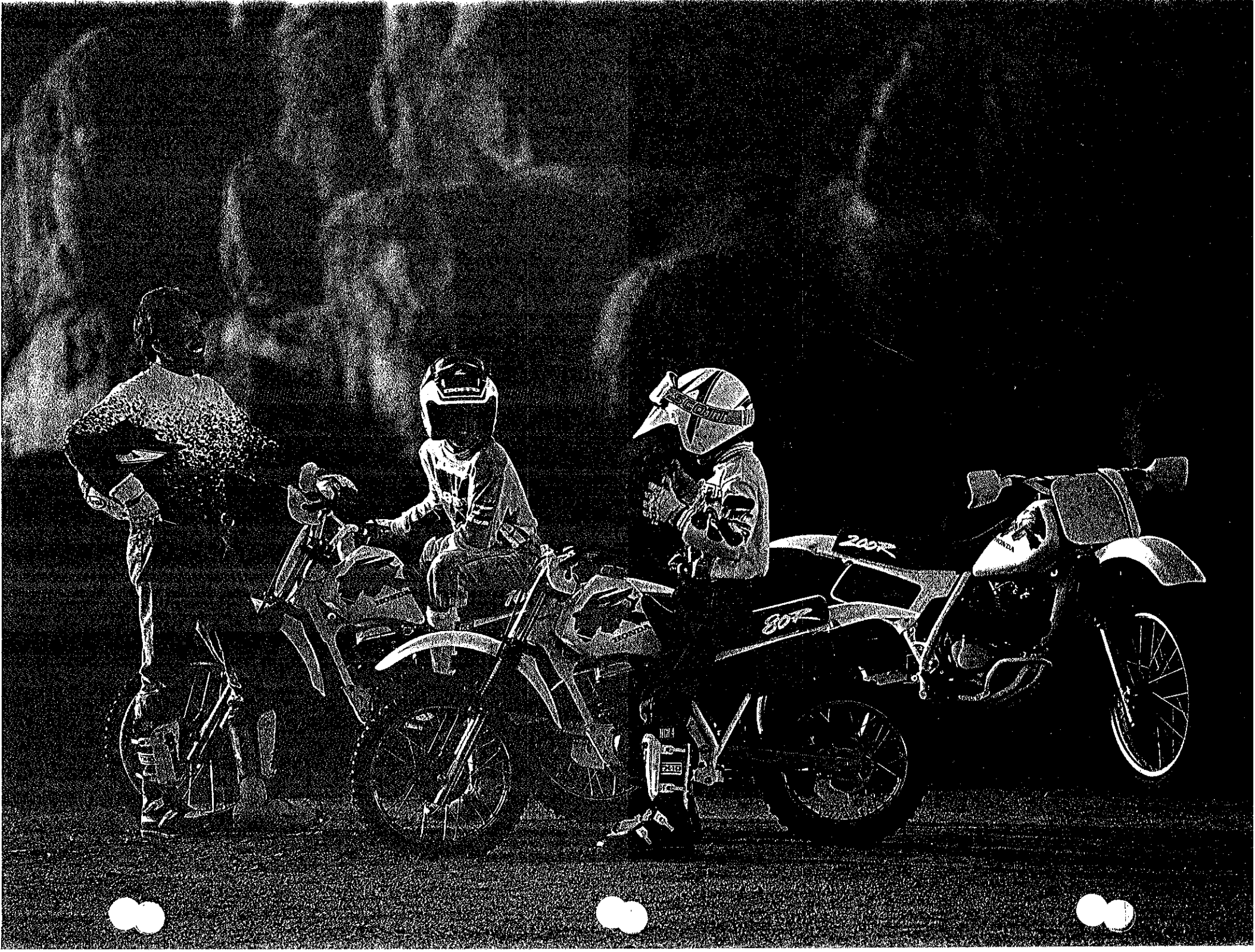
Fred Rice

Fred Rice

TAC - appropriate action
JB

FR:KT

# 1993 XR SERIES/CUB


200R
80R

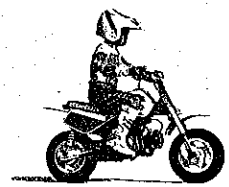
Honda's 1993 line of XR™200R, XR100R, XR80R, Cub® and Z50R off-road motorcycles lets the whole family enjoy the great outdoors on two wheels. They're all strong, reliable bikes backed by Honda's years of manufacturing expertise. And with five models to choose from, there's a perfect Honda for anyone who's ready to experience just how much fun off-road riding can be.

TAKE YOUR PICK. Our XR200R is a great choice for almost anyone. It's got the ground clearance of a full-bore off-road machine, yet for 1993 a new, lower 33-inch seat height lets it fit a wider range of riders.

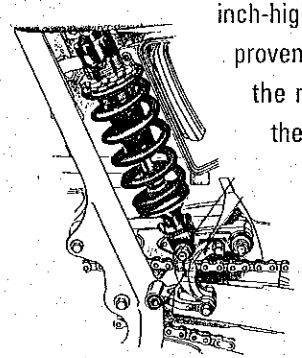
Teenagers or smaller riders will find our XR100R a natural choice. Slightly smaller wheels and a 30-inch-high seat team up to inspire confidence.

Our XR80R is the best bet for younger riders. And its light weight makes it easy for parents to load into a truck or trailer.

*"I remember how much fun I had on my old Z50 20 years ago. Now my kid's doing the same thing."*



And even the smaller members of the family can get in on the fun with the Z50R. Eight-inch wheels and a 22-inch-high seat, along with an engine that's proven itself for the last 25 years, make it the most valuable teaching aid since the blackboard.



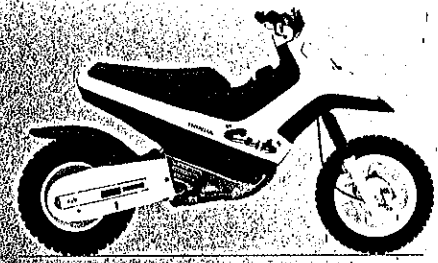
**Pro-Link rear suspensions on all three XRs feature single shock absorbers just like our biggest off-road bikes.**

But the best things about these Hondas never change. All three XR models and the Z50R share the features that have made Honda's off-road bikes legendary, and the choice of both beginning and experienced riders everywhere. They all offer rugged, four-stroke air-cooled single-cylinder engines, famous for their torque and easy-to-use powerbands. They sip gas, don't require any oil/gas premixing, and seem to run forever.

They all have strong steel chassis and comfortable seating. All the XR models use Honda's Pro-Link® single-shock rear suspensions for a smooth, compliant ride. In addition, all XRs, the Cub and the Z50R are built with durability in mind. Most offer features like maintenance-free CD ignitions, flexible plastic bodywork, skid plates, fork gaiters and steel sprockets to ensure that you spend your time riding, not wrenching.

JOIN THE CLUB. Best of all, when you choose a Honda XR, Cub, or the Z50R, you become part of the Honda family. This means you can join the Honda Rider's Club of America (call 1-800-847-4722 for information). Qualified buyers can also finance their purchase through the American Honda Finance Corporation. Naturally, every XR, Cub and Z50R comes with a six-month, unlimited mileage warranty, and Honda's unmatched reputation for quality and engineering. But the HondaCare® Protection Plan lets you extend virtually all of that warranty up to an additional three years. Just ask your dealer for details on any of these programs as well as advice on which Honda off-road bike is best for you.

Once you've made your choice, we're sure you'll find your new Honda the perfect outdoor companion. And you'll understand what XR and Z50R riders for the last two decades have known all along, and what more and more Cub riders are discovering every day: that there's simply no better motorcycle made—nor has there ever been—for experiencing the great outdoors.



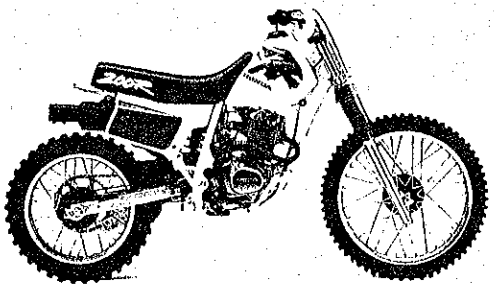
## A NEW KIND OF FUN

HONDA'S CUB IS THE SLICKEST, MOST INNOVATIVE AND FUN IDEA TO COME ALONG IN OFF-ROAD RIDING IN MORE THAN A GENERATION. YOU CAN USE IT TO RUN CAMPGROUND ERRANDS, TO EXPLORE TRAILS, OR TO JUST GET OUT IN THE FRESH AIR AND HAVE A LAUGH.

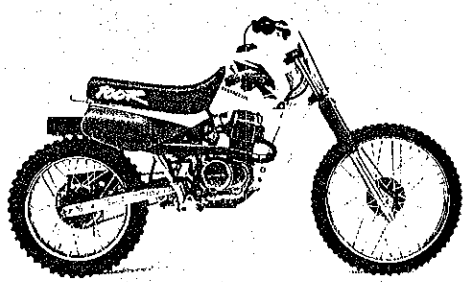
TO KEEP YOUR MIND ON RIDING AND NOT SHIFTING, THE CUB HAS A VARIABLE-RATIO AUTOMATIC TRANSMISSION. AND IT STARTS WITH THE PUSH OF A BUTTON.

SINCE WE KNOW YOU'D RATHER SPEND TIME ON THE TRAIL THAN IN THE GARAGE, WE'VE MADE THE CUB EASY TO MAINTAIN. AUTOMATIC OIL INJECTION ELIMINATES PRE-MIXING, AND A LOW-OIL WARNING LIGHT LETS YOU KNOW WHEN YOU NEED TO FILL UP.

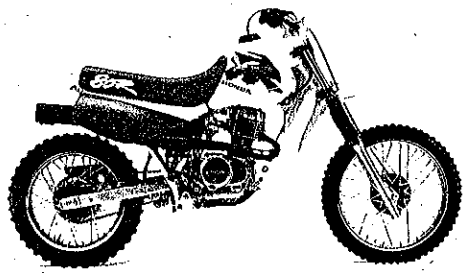
FOR YOUNGSTERS, OR JUST THOSE WHO ARE YOUNG AT HEART, IF YOU'VE EVER WANTED TO GET OUT ON THE TRAIL AND IN ON THE FUN, NOW YOU KNOW WHERE TO BEGIN—WITH A HONDA CUB.



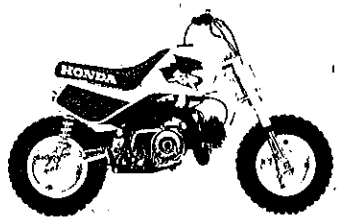
XR200R



XR100R

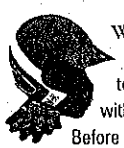


XR80R




Z50R

| SPECIFICATIONS | XR200R | XR100R | XR80R | Z50R | CUB |
|---|---|---|---|---|---|
| Engine | 195cc OHC single-cylinder four-stroke | 99cc OHC single-cylinder four-stroke | 80cc OHC single-cylinder four-stroke | 49cc OHC single-cylinder four-stroke | 90cc single-cylinder two-stroke |
| Bore and Stroke | 65.5mm x 57.8mm | 53.0mm x 45.0mm | 47.5mm x 45.0mm | 39.0mm x 41.4mm | 48.0mm x 49.6mm |
| Compression Ratio | 10.0:1 | 9.4:1 | 9.7:1 | 10.0:1 | 5.8:1 |
| Ignition | Maintenance-free CD | Maintenance-free CD | Maintenance-free CD | Maintenance-free CD | Maintenance-free CD |
| Transmission | Six-speed | Five-speed | Five-speed | Three-speed with automatic clutch | Variable-ratio automatic |
| Final Drive | O-ring sealed chain; 13/47 | Chain; 14/50 | Chain; 14/46 | Chain; 14/37 | Enclosed chain; 14/35 |
| Front Suspension | 36mm leading-axle, air-adjustable Kayaba™ fork; 8.2-inch travel | 27mm leading-axle fork; 5.5-inch travel | 27mm leading-axle fork; 5.5-inch travel | 21.7mm telescopic fork; 2.4-inch travel | 27mm leading-axle fork; 3.9-inch travel |
| Rear Suspension | Pro-Link with fully adjustable Kayaba shock; 8.3-inch travel | Pro-Link single-shock; 4.7-inch travel | Pro-Link single-shock; 4.3-inch travel | Hydraulic shock absorbers; 2.4-inch travel | Single shock; 4.3-inch travel |
| Front Tire | 80/100-21 | 2.50-19 | 2.50-16 | 3.50-8 | 100/90-12 |
| Rear Tire | 100/100-17 | 3.00-16 | 3.60-14 | 3.50-8 | 130/90-10 |
| Ground Clearance | 10.9 inches | 10.4 inches | 8.3 inches | 6.1 inches | 8.3 inches |
| Wheelbase | 53.5 inches | 49.4 inches | 47.0 inches | 35.2 inches | 47.2 inches |
| Seat Height | 33.5 inches | 30.3 inches | 28.5 inches | 22.6 inches | 29.5 inches |
| Fuel Capacity | 2.4 gallons, including 0.4-gallon reserve | 1.7 gallons, including 0.2-gallon reserve | 1.7 gallons, including 0.2-gallon reserve | 1.1 gallons, including 0.2-gallon reserve | 1.0 gallon, including 0.3-gallon reserve |
| Dry Weight | 223.0 pounds | 149.9 pounds | 140.8 pounds | 109.1pounds | 182.3 pounds |
| Color | White | White | White | White | Red |



WHAT'S IN A NAME For more than a generation, motorcyclists have come to associate one name more than any other with life on two wheels: Honda.

Before Honda built them, motorcycles were loud, temperamental machines that leaked oil. But we changed all that, and changed the entire industry along the way.

Year after year, we build performance, innovation, quality, and value into all our motorcycles—qualities rare in themselves, and almost impossible to find together.

On the track, in the dirt, and on the street, Honda keeps showing the rest of the world how to do it right. Because of Honda, it's hard to buy a bad motorcycle today. But it's also easy to find a great one.

Just look for the Honda name. When you find it, you'll be looking at the most influential company in the history of motorcycling. And the most important name in its future.

BE A RESPONSIBLE RIDER Riding a motorcycle is an exercise in responsibility—to yourself, to others, to the environment, and to the sport. So wear a helmet, eye protection, and protective clothing whenever you ride. Never ride under the influence of drugs or alcohol. Read your owner's manual and inspect your motorcycle before riding. Parents need to consider their youngster's age, size, ability, and maturity before allowing them to ride. Remember, Honda's XRs, Z50R and Cub are designed for off-road operator use only.

Whenever you ride off-road, follow the U.S. Forest Service's "Tread Lightly" guidelines, and always stay on established trails in approved riding areas. Keep your riding area clean and respect the rights of others. Never modify your silencer or spark arrestor.

Always obtain written permission before riding on private land, and obey all the laws and regulations governing your riding area.

HONDA
*Come ride with us.*

Specifications and availability subject to change without notice. ...lable on approved credit. ISee your Honda Dealer for complete details.
Cub® HondaCare® XR™ and Pro-Link® are Hon... Kayaba™ is a trademark of Kayaba Industry Co., Inc.
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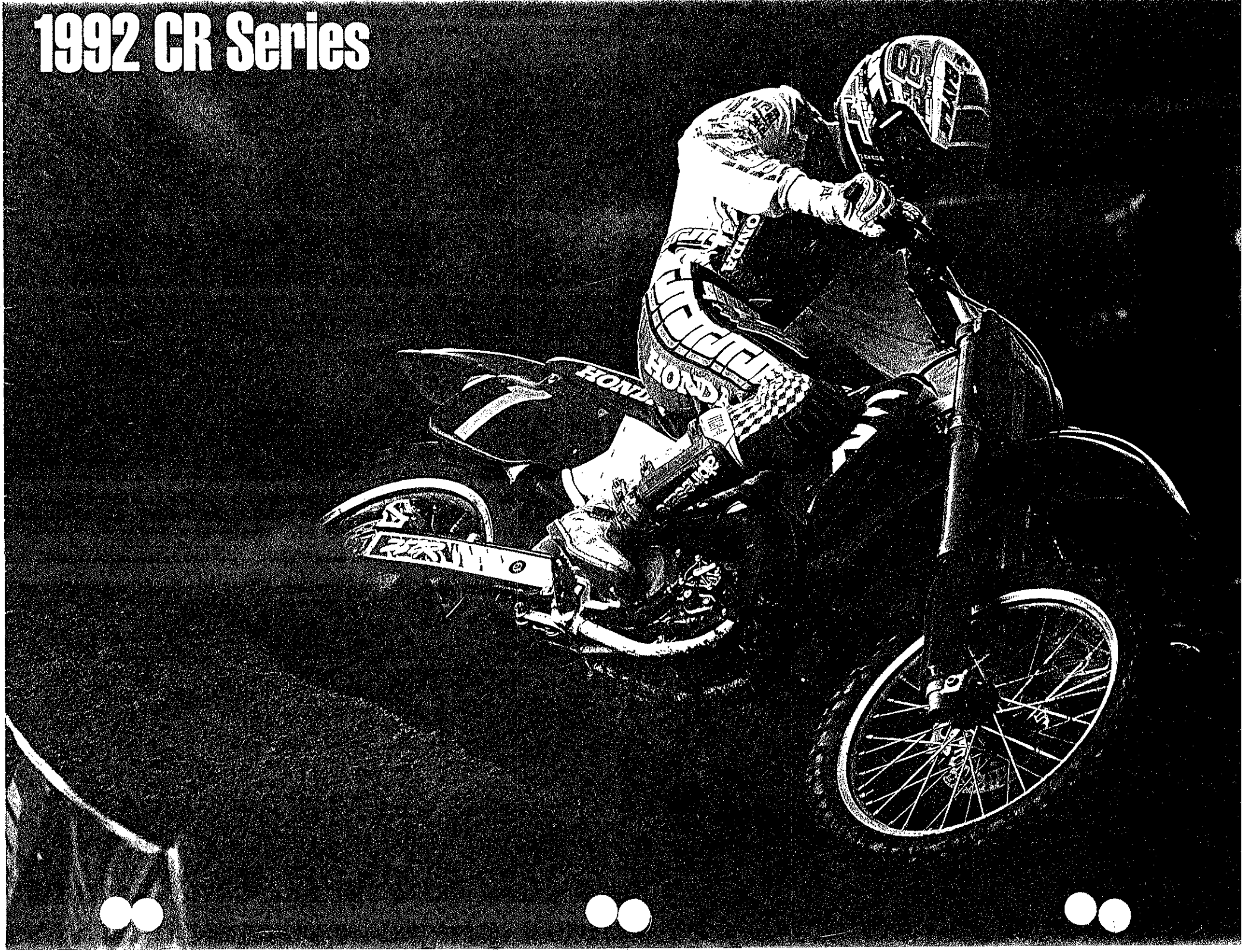
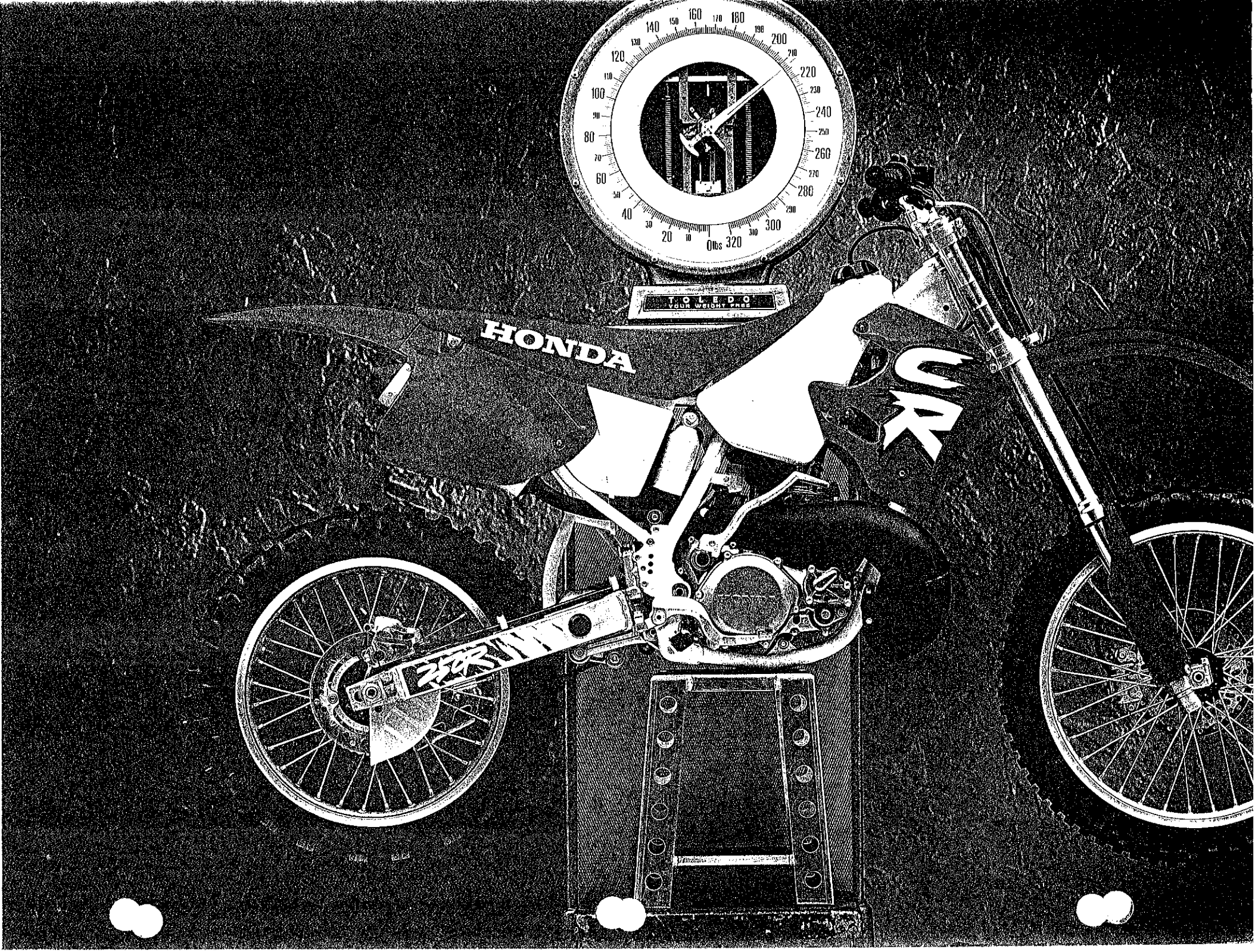
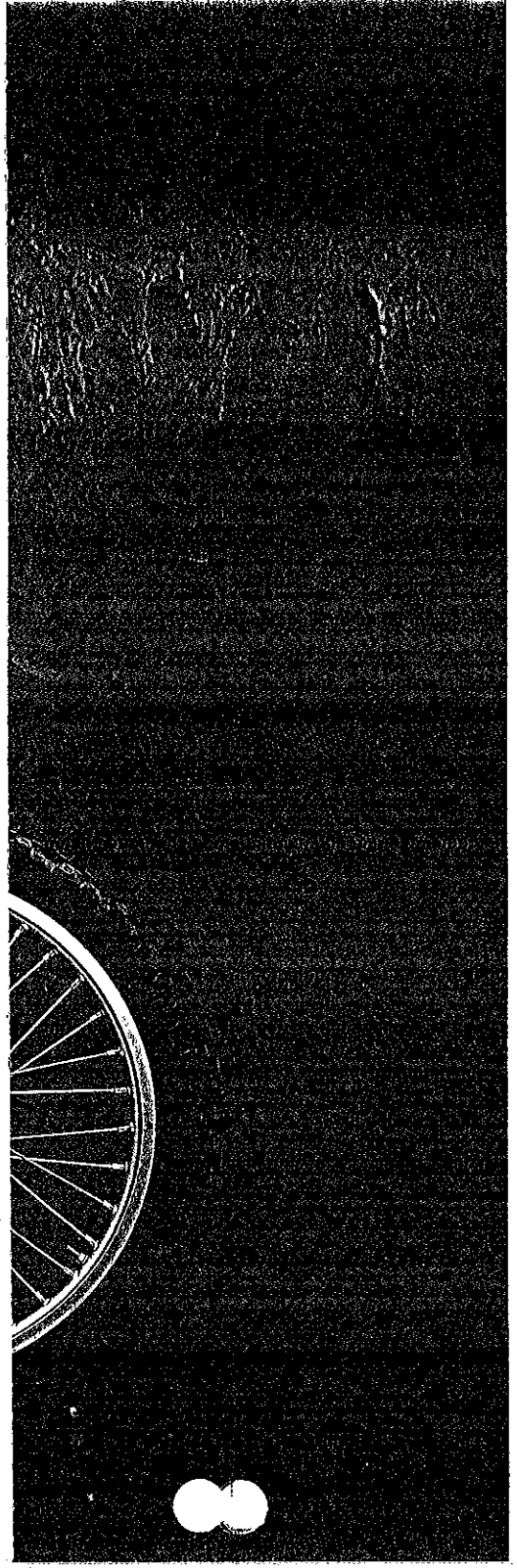
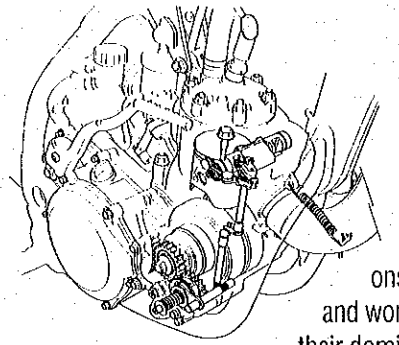
# 1992 CR Series




HONDA
CR
250R





*The CR250R's all-new power valve design eliminates 50 percent of the system's parts and simplifies maintenance.*

There's hot. There's red hot. And then there's CR™ hot.

For the last 19 years, Honda's CRs have been the hottest motocrossers you can ride. On every kind of track, CRs have proven over and over that they not only win races, but championships–more than 43 national and world titles in all. The CRs continued their dominance in 1991, winning the Supercross title as well as the Western and Eastern 125 Regional Supercross crowns.

With a record like that, you might think our engineers and riders would relax. But that's hardly the case. In fact, for 1992 they've been working overtime to make every CR faster, stronger, more powerful and better handling than ever.

## THE MACHINE CHAMPIONSHIPS ARE MADE OF.

Honda's totally new 1992 CR250R is a perfect example. The CR250R is a completely new machine–right down to its rad new fluorescent bodywork.

CR engines–especially the 250–have always set the standard on the track. Yet for 1992 we took the best engine in the business and made it even better.

For starters, we trimmed engine weight. That let our engineers reduce the CR250R's dry weight to a feathery 212.8 pounds. We followed with a new power valve system. It's the most advanced two-stroke variable exhaust port design available, providing a tremendous boost in mid-range power, yet flowing better wide-open for more top-end and improved overrev power.

Anyone who's prepped a bike between motos knows CRs are a breeze to work on. The new power valve system–with its simplified design–even helps here too, making routine maintenance easier than ever.

All that means the CR250R is certain to be the most powerful, most *ridable* 250 on the track.

*Jean Michel Bayle clinched Honda's fourth consecutive Supercross championship on a CR250R this year.*

## BUT THAT'S JUST THE BEGINNING.

Because the 250's engine cases are narrower, our designers could tuck the chassis in tighter too, making the CR250R more maneuverable.

Up front, a combination of a new triple-clamp offset and a new steering head angle yield even more responsive handling. Those triple clamps hold a new inverted 43mm Showa™ fork, a perfect match for the new chassis. The fork's spring-above-cartridge design, 14-position compression damping, lighter spring rate and this year's new 17-position rebound damping adjustability allow you to tune the suspension for an incredible range of track conditions.

## VICTORY LOVES COMPANY.

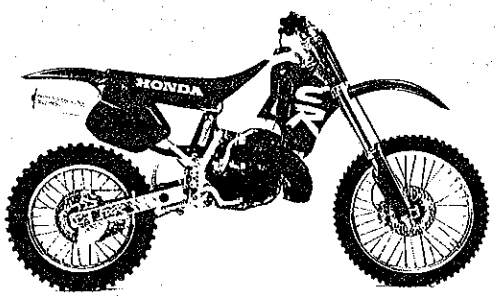
Honda engineers didn't spend all their time on the CR250R, though. Our open-class CR500R shares the CR250R's new front suspension, including its 17-position rebound damping adjustability. It also has a new silencer for better midrange and top-end power. And, like the 250, the CR500R features an entirely new front brake system with a redesigned caliper to resist flexing, a revised master-cylinder, and a shorter, works-type brake lever for more powerful stops and better brake feel.

Our class-ruling CR125R features a new combustion-chamber shape and a flat-top piston which pump out a higher compression ratio and even more horsepower. New triple clamps increase fork offset from 20mm to 22mm for better tracking over whoops and stutter bumps. Like the 500 and the 250, the 125 gets an all-new front brake system for more stopping power and better feel. And the 125 boasts Showa's new 43mm inverted fork with 14-position compression damping and 17-position rebound damping adjustability for even better handling.

Then there's our mighty mini, the CR80R. For 1992 it gets a new rear disc brake, an improvement sure to make it the dominant bike in its class. Which means you can start your racing career right and have your best shot at bringing home the gold every time you compete.

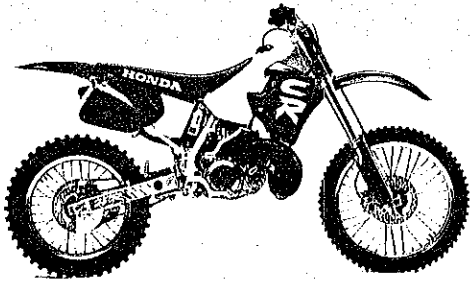
Isn't *that* a pleasant thought.

Honda's 1992 CR line. We've really turned up the heat this year. But the only riders who'll get burned are the ones on some other brand.



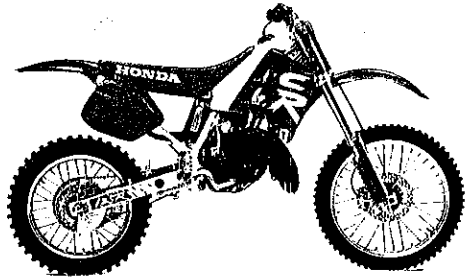
## CR500R

| | |
|---|---|
| **Model** | CR500R |
| **Engine** | 491cc single-cylinder liquid-cooled two-stroke |
| **Bore and Stroke** | 89mm x 79mm |
| **Induction** | Eight-petal reed valve |
| **Carburetion** | 38mm flat-slide |
| **Ignition** | Solid-state CD with electronic advance |
| **Transmission** | Five-speed |
| **Final Drive** | #520 chain; 14/49 |
| **Suspension Front** | 43mm Showa™ inverted, cartridge-type adjustable fork with 14-position compression damping and 17-position rebound damping adjustability, 12.2-inch travel |
| **Rear** | Pro-Link® with fully adjustable Kayaba™ reservoir shock with 22-position compression damping and 20-position rebound damping adjustability, 12.6-inch travel |
| **Brakes Front** | Single-disc with twin-piston caliper |
| **Rear** | Single-disc |
| **Wheelbase** | 58.5 inches |
| **Seat Height** | 38.0 inches |
| **Ground Clearance** | 13.5 inches |
| **Dry Weight** | 222.7 pounds |
| **Fuel Capacity** | 2.4 gallons |



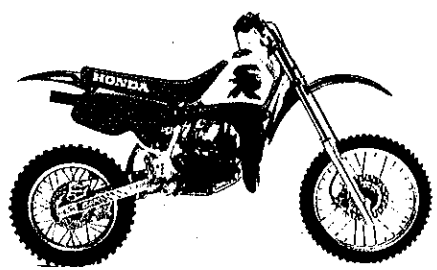
## CR250R

| | |
|---|---|
| **Model** | CR250R |
| **Engine** | 249cc Nikasil®-plated single-cylinder liquid-cooled two-stroke |
| **Bore and Stroke** | 66.4mm x 72mm |
| **Induction** | Four-petal reed valve |
| **Carburetion** | 38mm flat-slide |
| **Ignition** | Solid-state CD with electronic advance |
| **Transmission** | Close-ratio five-speed |
| **Final Drive** | #520 chain; 13/49 |
| **Suspension Front** | 43mm Showa inverted, cartridge-type adjustable fork with 14-position compression damping and 17-position rebound damping adjustability, 12.2-inch travel |
| **Rear** | Pro-Link with fully adjustable Showa reservoir shock with 22-position compression damping and 18-position rebound damping adjustability, 12.6-inch travel |
| **Brakes Front** | Single-disc with twin-piston caliper |
| **Rear** | Single-disc |
| **Wheelbase** | 57.6 inches |
| **Seat Height** | 38.2 inches |
| **Ground Clearance** | 13.8 inches |
| **Dry Weight** | 212.8 pounds |
| **Fuel Capacity** | 2.0 gallons |



## CR125R

| | |
|---|---|
| **Model** | CR125R |
| **Engine** | 125cc Nikasil-plated single-cylinder liquid-cooled two-stroke |
| **Bore and Stroke** | 54mm x 54.5mm |
| **Induction** | Crankcase reed valve |
| **Carburetion** | 36mm flat-slide |
| **Ignition** | Solid-state CD with electronic advance |
| **Transmission** | Close-ratio six-speed |
| **Final Drive** | #520 chain; 13/51 |
| **Suspension Front** | 43mm Showa inverted, cartridge-type adjustable fork with 14-position compression damping and 17-position rebound damping adjustability, 12.2-inch travel |
| **Rear** | Pro-Link with fully adjustable Kayaba reservoir shock with 22-position compression damping and 20-position rebound damping adjustability, 12.6-inch travel |
| **Brakes Front** | Single-disc with twin-piston caliper |
| **Rear** | Single-disc |
| **Wheelbase** | 56.8 inches |
| **Seat Height** | 38.6 inches |
| **Ground Clearance** | 14.5 inches |
| **Dry Weight** | 191.8 pounds |
| **Fuel Capacity** | 2.0 gallons |



## CR80R

| | |
|---|---|
| **Model** | CR80R |
| **Engine** | 83cc Nikasil-plated single-cylinder liquid-cooled two-stroke |
| **Bore and Stroke** | 47mm x 47.8mm |
| **Induction** | Reed valve |
| **Carburetion** | 28mm piston valve |
| **Ignition** | Solid-state CD with electronic advance |
| **Transmission** | Close-ratio six-speed |
| **Final Drive** | #420 chain; 15/49 |
| **Suspension Front** | 35mm air-adjustable Showa fork, 10.8-inch travel |
| **Rear** | Pro-Link with fully adjustable Showa shock, 11-inch travel |
| **Brakes Front** | Single-disc |
| **Rear** | Single-disc |
| **Wheelbase** | 49.4 inches |
| **Seat Height** | 31.9 inches |
| **Ground Clearance** | 12.2 inches |
| **Dry Weight** | 138.9 pounds |
| **Fuel Capacity** | 1.3 gallons |

**What's In A Name** For more than a generation, motorcyclists have come to associate one name more than any other with life on two wheels: Honda.

Before Honda built them, motorcycles were loud, temperamental machines that leaked oil. But we changed all that, and changed the entire industry along the way.

Year after year, we build performance, innovation, quality and value into all our motorcycles–qualities rare in themselves, and almost impossible to find together.

On the track, in the dirt, and on the street, Honda keeps showing the rest of the world how to do it right. Because of Honda, it's hard to buy a bad motorcycle today. But it's also easy to find a great one.

Just look for the Honda name. When you find it, you'll be looking at the most influential company in the history of motorcycling. And the most important name in its future.

**Be A Responsible Rider** Riding a motorcycle is an exercise in responsibility–to yourself, to others, to the environment and to the sport. So wear a helmet, eye protection, and protective clothing whenever you ride. Never ride under the influence of drugs or alcohol. Read your owner's manual, and inspect your motorcycle before riding.

Whenever you ride off-road, follow the U.S. Forest Service's "TREAD LIGHTLY" guidelines, and always stay on established trails in approved riding areas. Keep your riding area clean, and respect the rights of others. Never modify your silencer or spark arrestor.

Always obtain written permission before riding on private land, and obey the laws and regulations governing your riding area. Remember, CRs are designed for off-road operator use only in organized, closed-course racing events.

**TREAD LIGHTLY!**
ON PUBLIC AND PRIVATE LAND

Specifications and availability subject to change without notice. CRs [illegible] "AS IS" without warranty. CR,™HPP,™ and Pro-Link™are Honda trademarks. Showa™ is a trademark of Showa Mfg. Inc. Nikasil™ is a registered [illegible]hle Gesellschaft. Kayaba™ is a trademark of Kayaba Industry Co., Inc.
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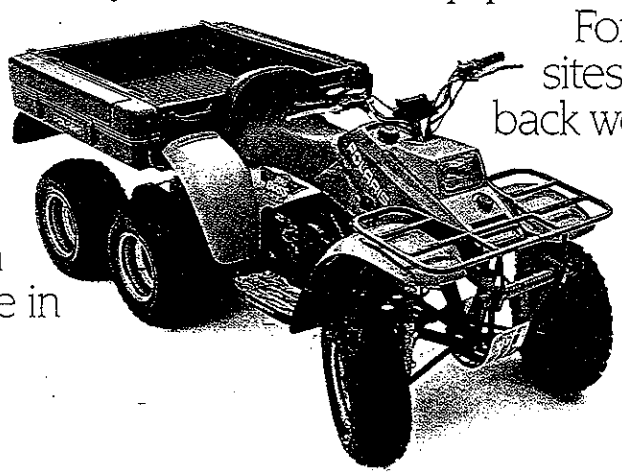
**HONDA**
*Come ride with us.*

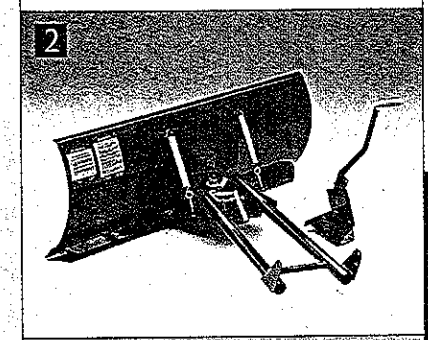
# FORCE, GET A BIG BOSS 4x6.

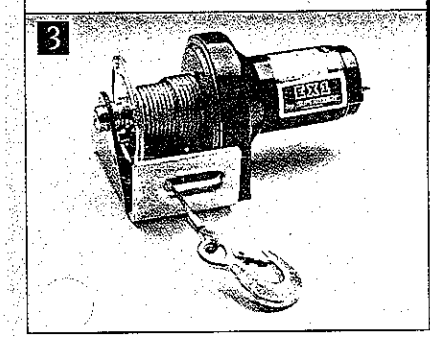
speed if the throttle sticks. And, of course, the PVT (Polaris Variable Transmission) means you never have to shift gears.

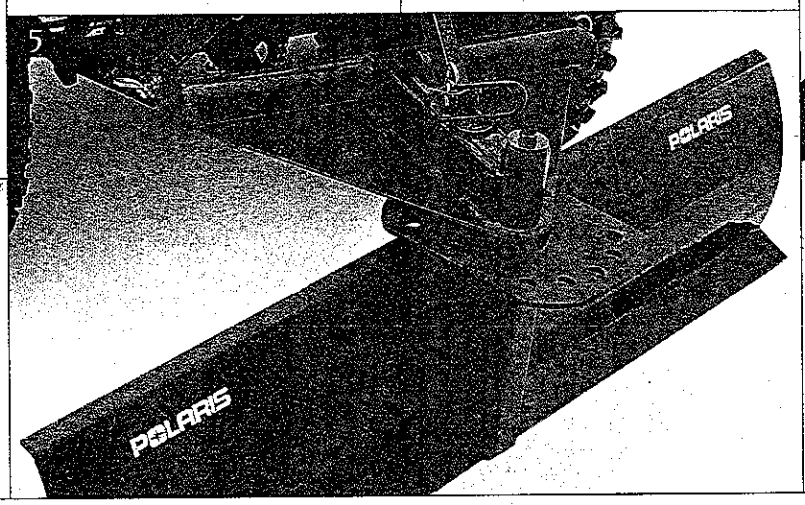
The Big Boss is a recreational v[illegible]cle as well, [illegible]e to haul an entire campsite in a single trip, or supply a remote hunting cabin with food and equipment for a week.

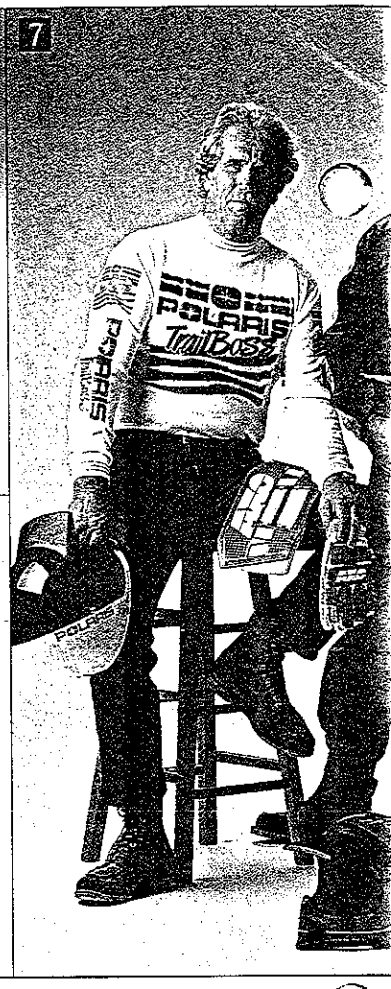


For farms, construction sites, back yards or the back woods, a Big Boss 4x6 gives you the extra strength you need to do what needs to be done.



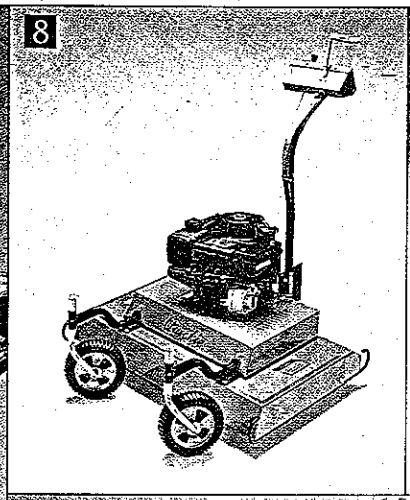


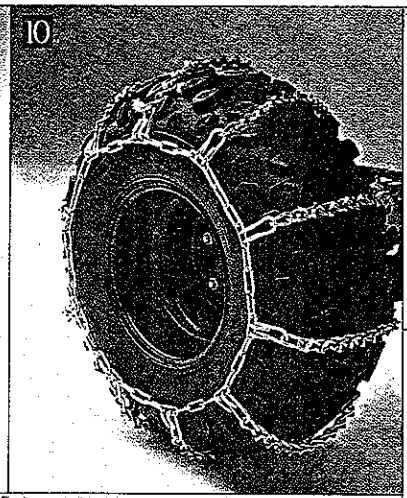


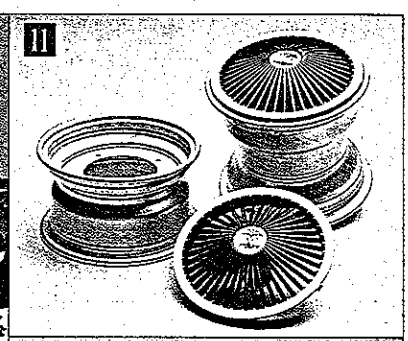

# WE HAVE THE PERFECT ACCESS

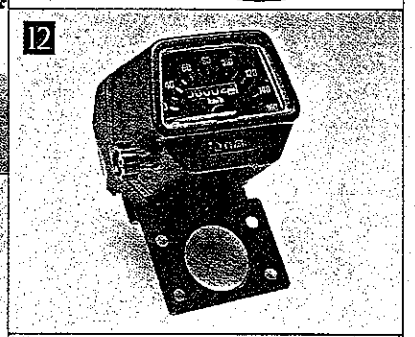
**1** Oil **2** Optional front plow **3** Optional winch **4** Gun scabbard **5** Adjustable 3-point hitch with hydraulic lift and rear blade **6** Seeder/spreader **7** Riding jerseys, riding suit, helmets to match your machine, gloves, kidney bel

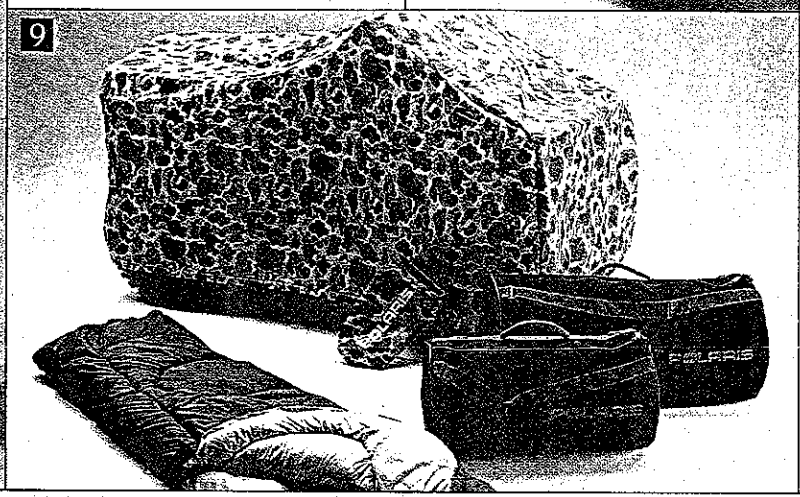
| | TRAIL BOSS | TRAIL BOSS 2x4 |
|---|---|---|
| STANDARD EQUIPMENT | Floorboards, rear rack, hitch, tool kit, ETC Electronic Throttle Control, hi/lo beam headlight, storage compartment, parking brake, heavy-duty chain guard. | Floorboards, front and rear racks, hitch, tool kit, ETC Electronic Throttle Control, hi/lo beam headlight, storage compartment, parking brake, heavy-duty chain guard. |
| OPTIONAL EQUIPMENT | Windshield, front rack, aluminum rims, tire chains, whip flag, hub caps, speedometer, seeder/spreader, winch, front blade, 3-point hitch with rear blade. | Windshield, aluminum rims, winch, tire chains, whip flag, hub caps, speedometer, seeder/spreader, 10 and 7 hp mower units, front blade, 3-point hitch with rear blade. |
| ENGINE/LUBRICATION | 244cc air-cooled 2-stroke/Oil-injection | 244cc air-cooled 2-stroke/Oil-injection |
| FUEL/OIL CAPACITY | 4 gals./2 qts. | 4 gals./2 qts. |
| CARBURETION | 30mm Mikuni | 30mm Mikuni |
| STARTING | Electric with recoil backup | Electric with recoil backup |
| ELECTRICAL | 150-watt alternator | 150-watt alternator |
| TRANSMISSION | Automatic PVT (Polaris Variable Transmission) with reverse | Automatic PVT (Polaris Variable Transmission) with high, low and reverse |
| WHEELBASE | 49.5" | 49.75" |
| TURNING RADIUS | 89" (unloaded) | 89" (unloaded) |
| DRY WEIGHT | 400 lbs. | 440 lbs. |
| LENGTH/WIDTH/HEIGHT | 73.2"/44"/44" | 73.2"/44"/44" |
| FRONT SUSPENSION | MacPherson strut with 6.25" travel | MacPherson strut with 6.25" travel |
| REAR SUSPENSION | Single shock with 8.5" travel | Single shock with 8.5" travel |
| FRONT/REAR BRAKES | Single-control hydraulic disc with mechanical aux. foot brake | Single-control hydraulic disc with mechanical aux. foot brake |
| FRONT TIRE SIZE (PSI) | 22x8x10 (3) | 22x8x10 (3) |
| REAR TIRE SIZE (PSI) | 22x11x10 (3) | 24x11x10 (3) |
| LOAD CAPACITY F/R | 125 lbs. rear rack | 75 lbs. front rack/125 lbs. rear rack |
| CARGO BOX | — | — |
| HITCH | 30 lb. tongue capacity, 850 lb. towing capacity | 30 lb. tongue capacity, 850 lb. towing capacity |

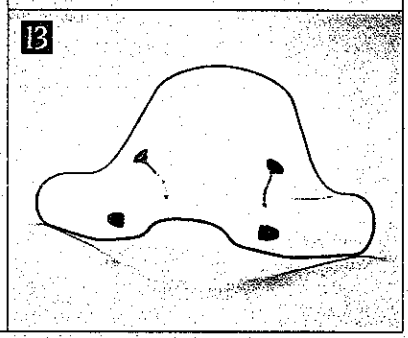


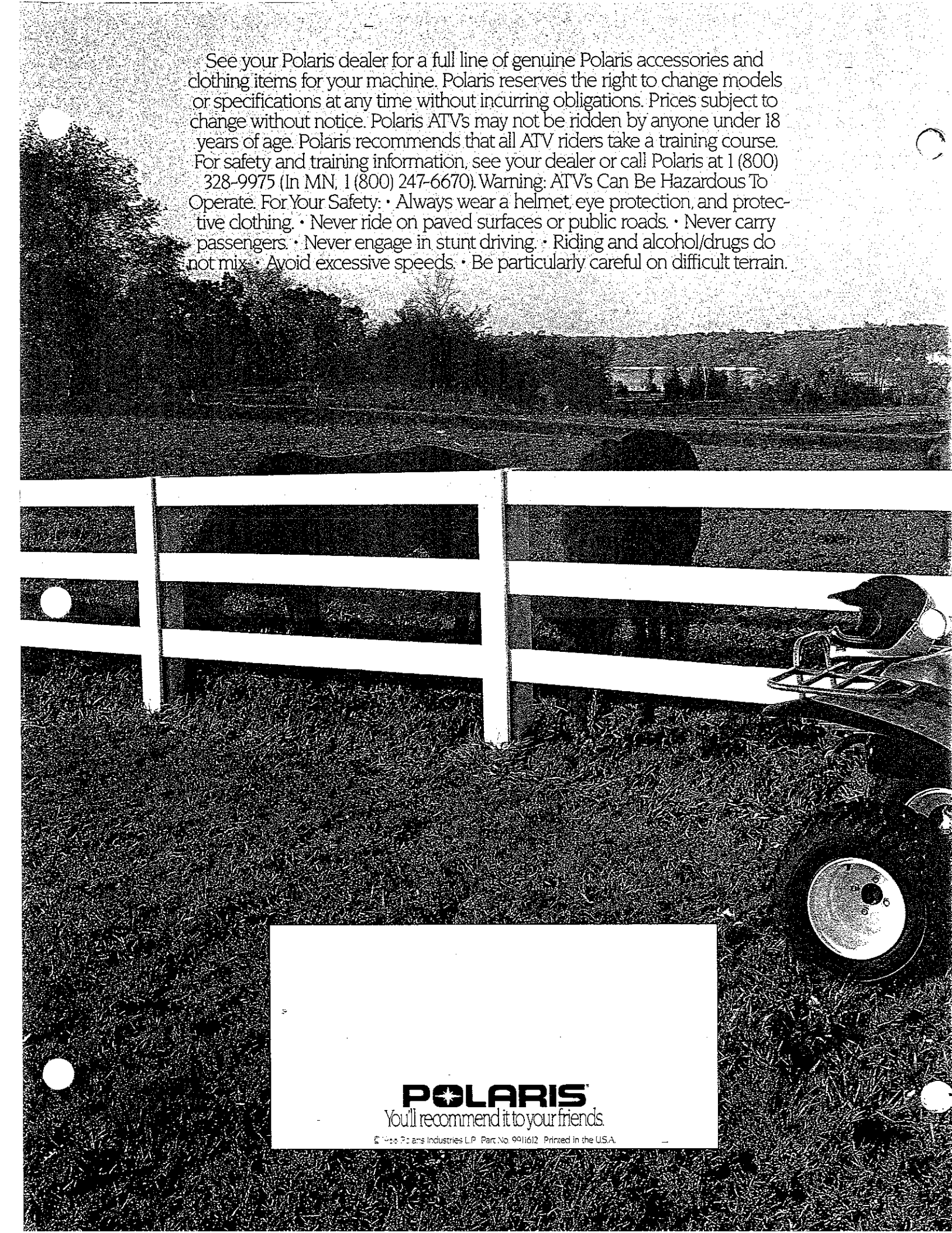




# RIES TO COMPLETE ANY OUTFIT.

8 Optional front mower kit 9 Cover, in black or camouflage; sleeping bag; duffle bags 10 Optional tire chain kits 11 Aluminum rims and hubcaps 12 Handlebar-mounted speedometer with trip meter 13 Windshield

| TRAIL BOSS 4x4 | BIG BOSS 4x6 |
|---|---|
| Floorboards, front and rear racks, hitch, tool kit. ETC Electronic Throttle Control, hi/lo beam headlight, storage compartment, parking brake, heavy-duty chain guard. Windshield, aluminum rims, winch, front and rear tire chains, whip flag, hub caps, speedometer, 10 and 7 hp mower units, seeder/spreader, front blade, 3-point hitch with rear blade. | Articulated rear wheels, backrest, floorboards, front rack, hitch, tool kit, ETC Electronic Throttle Control, hi/lo beam headlight, two cargo box storage compartments, parking brake, heavy-duty chain guard. Windshield, aluminum rims, winch, rear tire chains, hub caps, speedometer, 10 and 7 hp mower units, seeder/spreader, front blade. |
| 244cc air-cooled 2-stroke/Oil-injection<br>4 gals./2 qts.<br>30mm Mikuni<br>Electric with recoil backup<br>150-watt alternator<br>Automatic PVT (Polaris Variable Transmission) with high/low reverse and electro-mechanical shift-on-the-fly 4WD | 244cc air-cooled 2-stroke with fan assist/Oil-injection<br>4 gals./2qts.<br>30mm Mikuni<br>Electric with recoil backup<br>150-watt alternator<br>Automatic PVT (Polaris Variable Transmission) with high/low and reverse |
| 49.75"<br>89" (unloaded)<br>4[illegible]<br>7[illegible] 4.5"/46" | 75"<br>162" (unloaded)<br>650 lbs.<br>97.5"/44.5"/44" |
| [illegible]Pherson strut with 6.25" travel<br>Single shock with 8.5" travel<br>Single-control hydraulic disc with mechanical aux. foot brake<br>22x8x10 (4)<br>24x11x10 (3)<br>75 lbs. front rack/125 lbs. rear rack<br>30 lb. tongue capacity, 850 lb. towing capacity | MacPherson strut with 6.25" travel<br>Single shock with 5.25" travel<br>Dual-control hydraulic disc<br>22x8x10 (4)<br>22x11x10 (3)<br>75 lbs. front rack/650 lbs. cargo bed<br>41"x34"x8". Capacity: 6.4 ft³ (13.68 ft³ with optional stake sides)<br>30 lb. tongue capacity, 850 lb. towing capacity |



See your Polaris dealer for a full line of genuine Polaris accessories and clothing items for your machine. Polaris reserves the right to change models or specifications at any time without incurring obligations. Prices subject to change without notice. Polaris ATV's may not be ridden by anyone under 18 years of age. Polaris recommends that all ATV riders take a training course. For safety and training information, see your dealer or call Polaris at 1 (800) 328-9975 (In MN, 1 (800) 247-6670). Warning: ATV's Can Be Hazardous To Operate. For Your Safety: • Always wear a helmet, eye protection, and protective clothing. • Never ride on paved surfaces or public roads. • Never carry passengers. • Never engage in stunt driving. • Riding and alcohol/drugs do not mix. • Avoid excessive speeds. • Be particularly careful on difficult terrain.

POLARIS

You'll recommend it to your friends.

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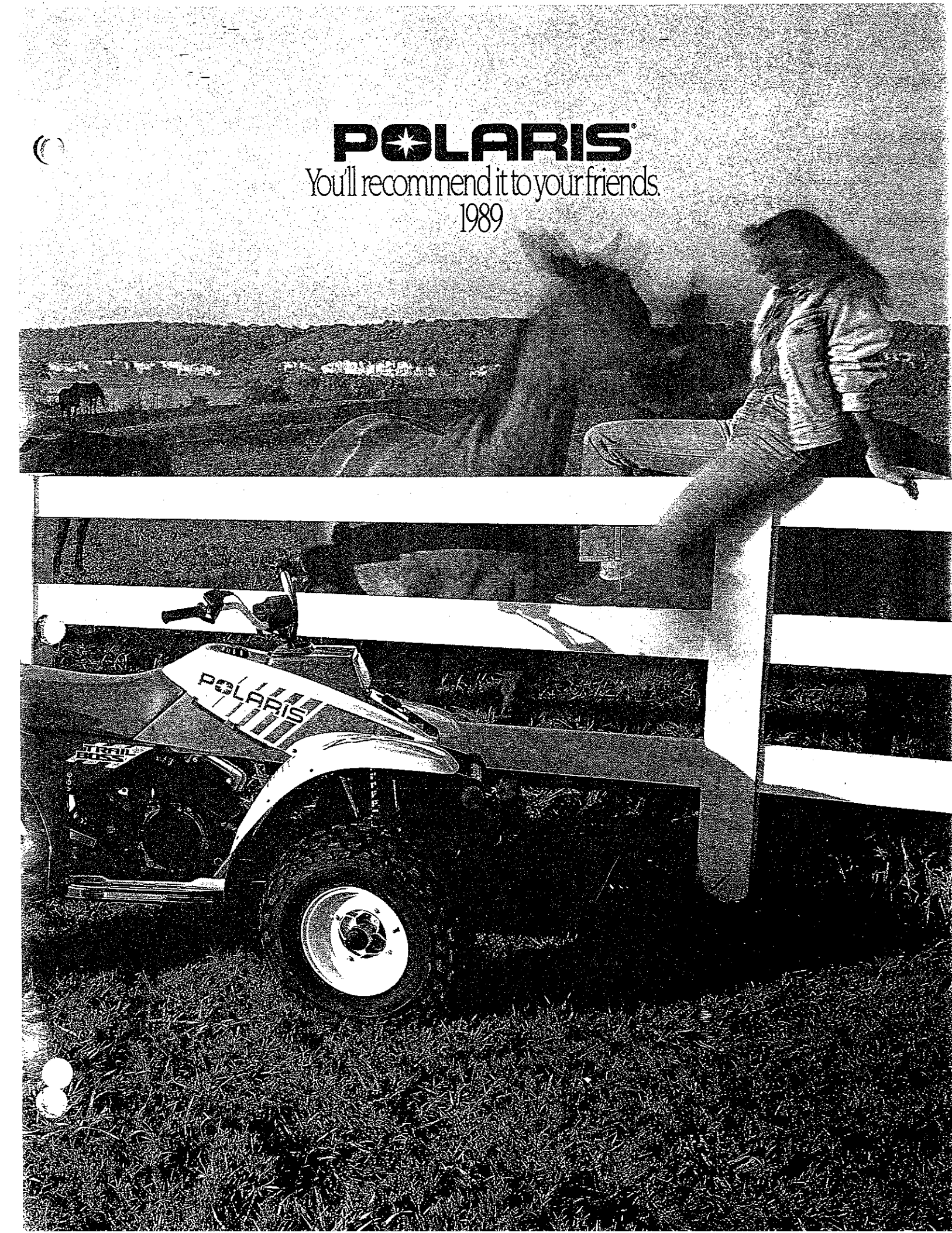
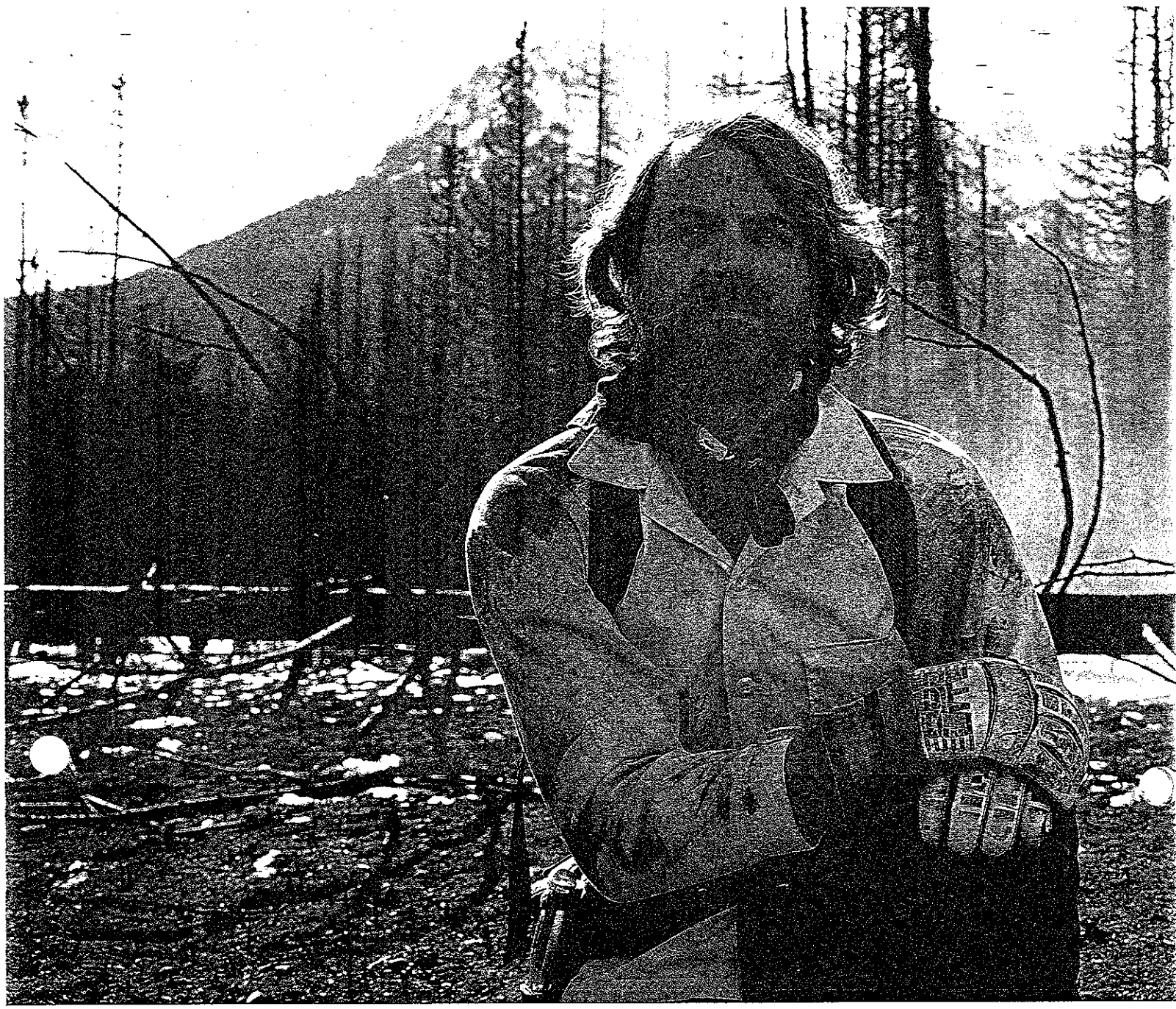

POLARIS
You'll recommend it to your friends.
1989
TRAIL BOSS

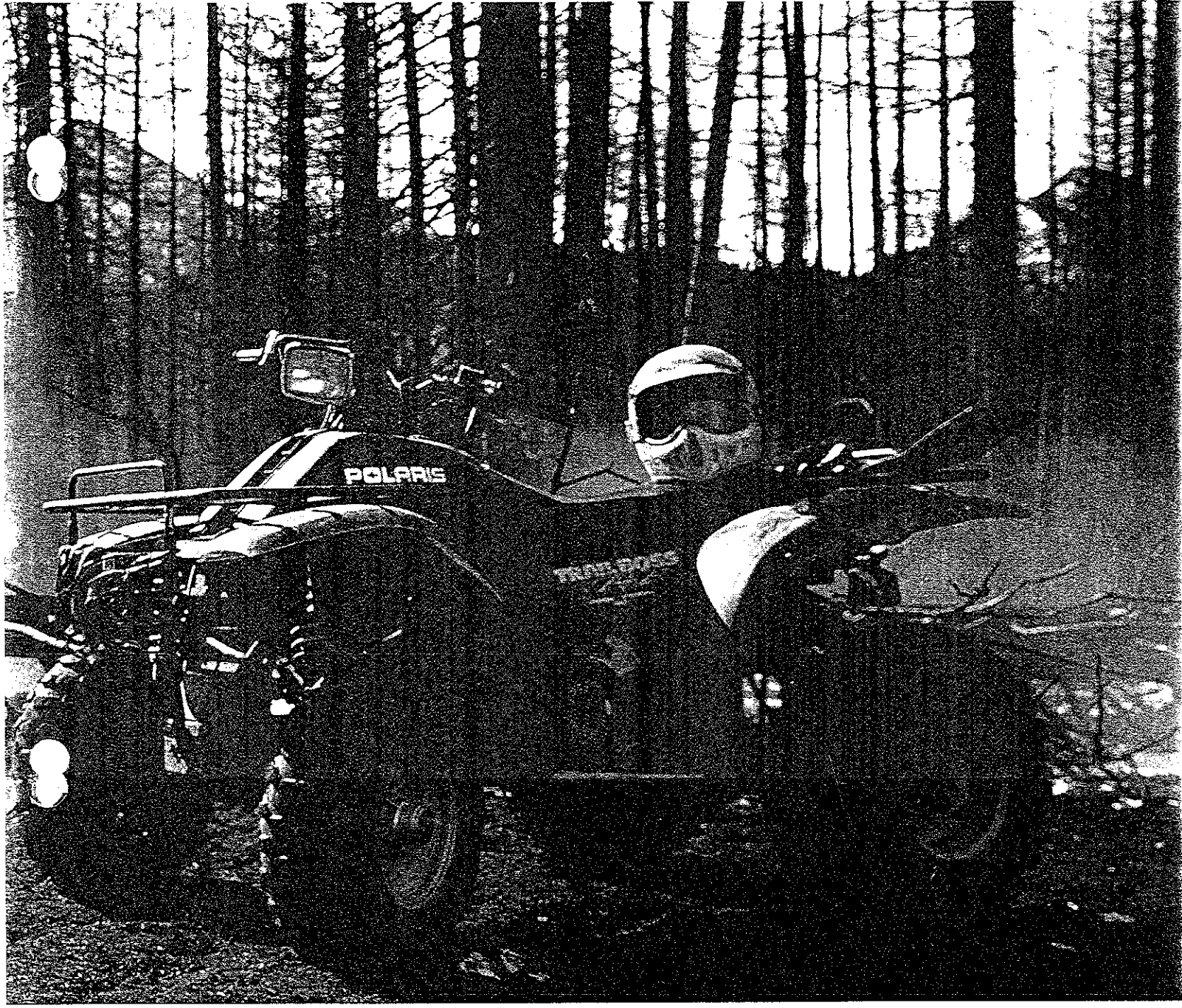


# POLARIS ATV's: BUILT WITH THE KNOWLE

Ever since we made our first ATV in 1984, we at Polaris have forged a different trail from other manufacturers.

While they concentrated on the young, sport-performance market, with shots of candy-colored vehicles rocketing over sand dunes or blasting through rock-strewn streams, we concentrated on building the best ATV's for the real world of pastures, construction sites and deer stands.

(Not that Polaris ATV's aren't up to the occasional just-for-the-heck-of-it spin: we've won our share of enthusiast




## GE THAT THE WORLD IS NOT A PLAYGROUND.

magazine "shoot-outs.")

We build ATV's that you'd be proud to recommend to your friends.

From the beginning, every Polaris ATV has featured our automatic PVT (Polaris Variable Transmission), so you don't have to mess around with shifting when you should be concentrating on the task at hand.

And we put full, solid floorboards under your feet, instead of the competition's motorcycle pegs.

Because Polaris ATV's are made with the recognition that, in the real world, play time has to wait until the work is done.

# NO ONE THING MAKES A P

New ETC (Electronic Thr e Control) limits engine speed i throttle becomes stuck, and can be used to maintain con- stant throttle position

4 gal. (U.S.) fuel capacity with sight gauge

Automatic PVT (Polaris Variable Transmission)

Polaris-designed 244cc two-stroke engine

New 150-watt alternator lets you power more accessories

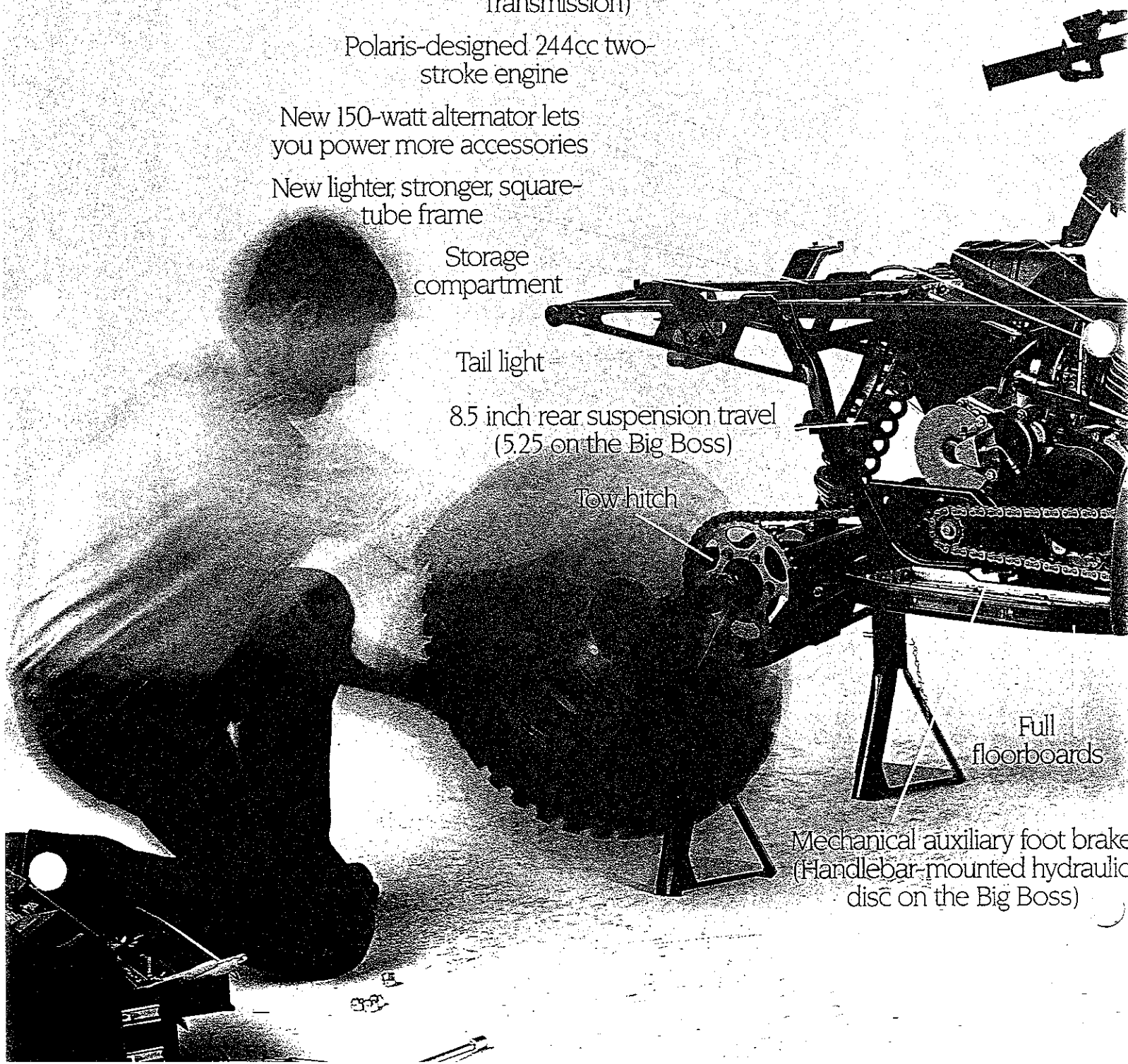
New lighter, stronger, square-tube frame

Storage compartment

Tail light

8.5 inch rear suspension travel (5.25 on the Big Boss)

Tow hitch



Full floorboards

Mechanical auxiliary foot brake (Handlebar-mounted hydraulic disc on the Big Boss)

# LARIS THE RIGHT CHOICE.

Gas fill cap with overflow to prevent seat spills

Electric start with recoil back-up

Parking brake

Single-lever all-wheel hydraulic disc brakes

Tight turning radius

Choke

On/off key switch

High-low beam integrated headlight

High/low/reverse gear control (No low in Trail Boss model)

Oil fill

Fully-enclosed high-impact plastic fenders

Made in the U.S.A.

Air intake with triple dust protection

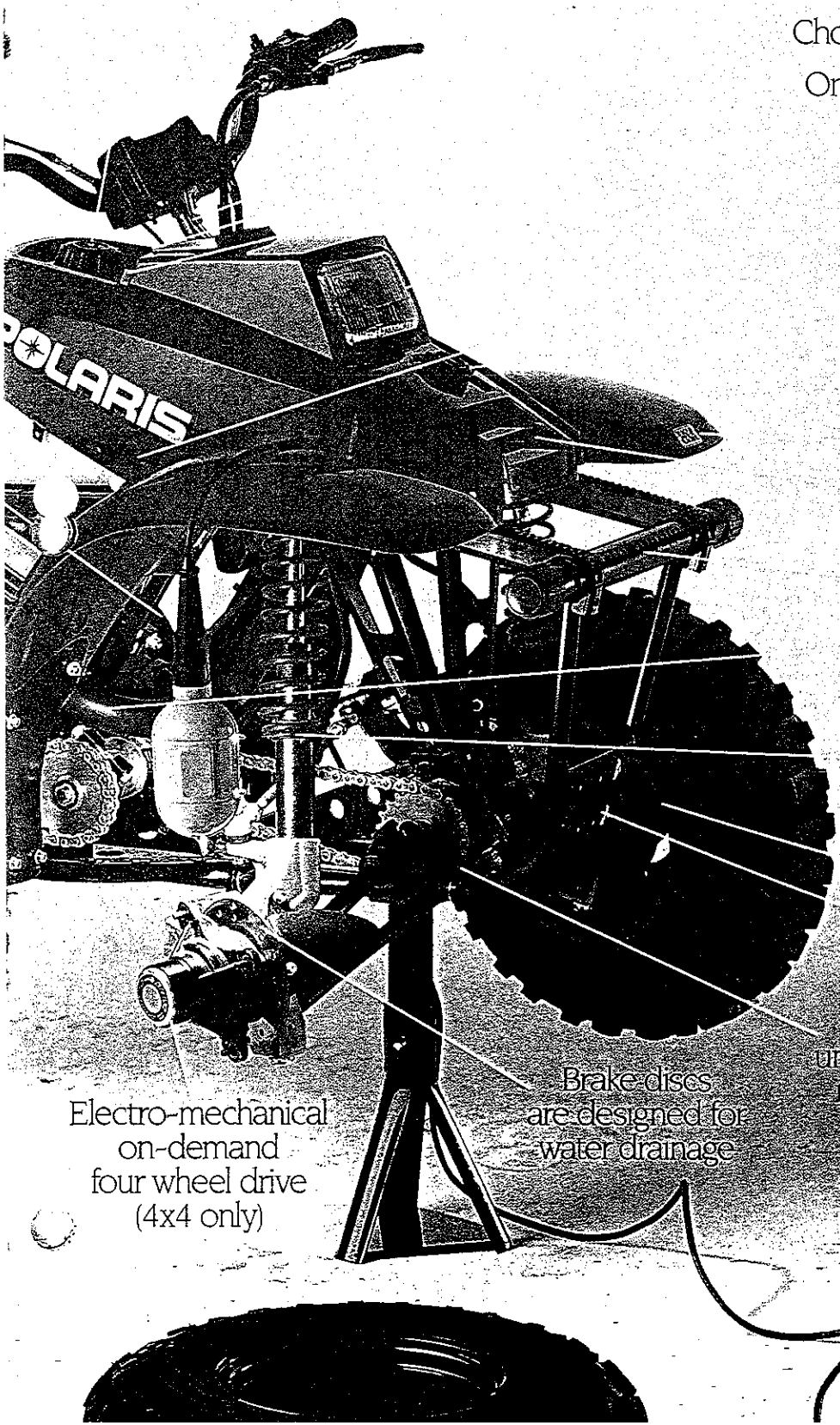
Front bumper

Tuned, USDA-approved exhaust system

MacPherson strut front suspension with 6.25 inches of travel

Steel rims

Steel brush guard (4x4 only)




Full steel undercarriage rockguard (4x4 only)

Brake discs are designed for water drainage

Electro-mechanical on-demand four wheel drive (4x4 only)

## COUNT ON THE TRAIL BOSS TO

When you need to be someplace other than where you are, the quickest, easiest, most-fun way to get there is the Trail Boss: the best-performing ATV we've ever made. The front end rides on MacPherson struts. The rear suspension gives you 8½ inches of wheel travel, the most of any non-racing ATV.

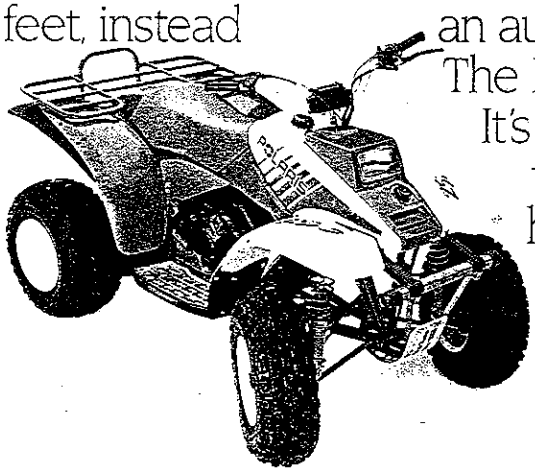
And the Trail Boss is as adept at work as it is at play. It boasts a 244cc engine. It will take you places previously accessible only by foot, and get you there a lot faster. And it will carry payloads your back will be more than happy to relinquish.

## :T YOU WHERE YOU'RE NEEDED.

All Trail Bosses are driven by automatic PVT (Polaris Variable Transmission), and put full floorboards under your feet, instead of pegs.

New this year are E[illegible] (Electronic T[illegible]ottle Control, which limits engine speed if the throttle sticks, and can be used to maintain a constant throttle position), and an auxiliary foot brake.

The Polaris Trail Boss: It's one hard worker that really knows how to show you a good time.



# WITH A TRAIL BOSS 2x4, YOU'LL NEVER BE LI

It's a quite indisputable fact that an ATV can get you further, faster, than your own two feet can. And shoulder a heavier load while doing it.

But even after the superiority of ATV over feet has been established, the question remains: Which ATV?

For a growing number of people, the answer to that questio is an easy one: the Polaris Trail Boss 2x4.

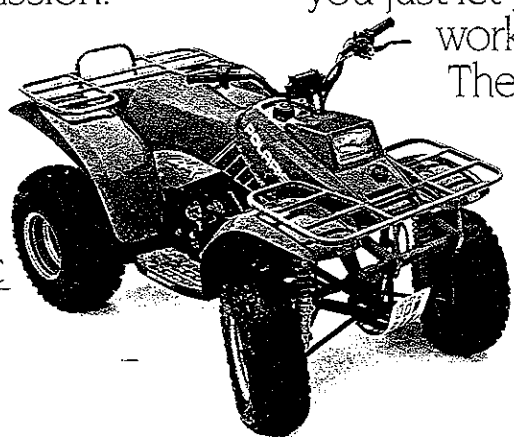
Whether you're hunting, checking a fence line, tracking down some wayward cattle, or if you just have a hankering for horizon-chasing, the Trail Boss 2x4's versatility and ease of use make it your vehicle of choice.

# WONDERING WHAT LIES OVER THE NEXT HILL.

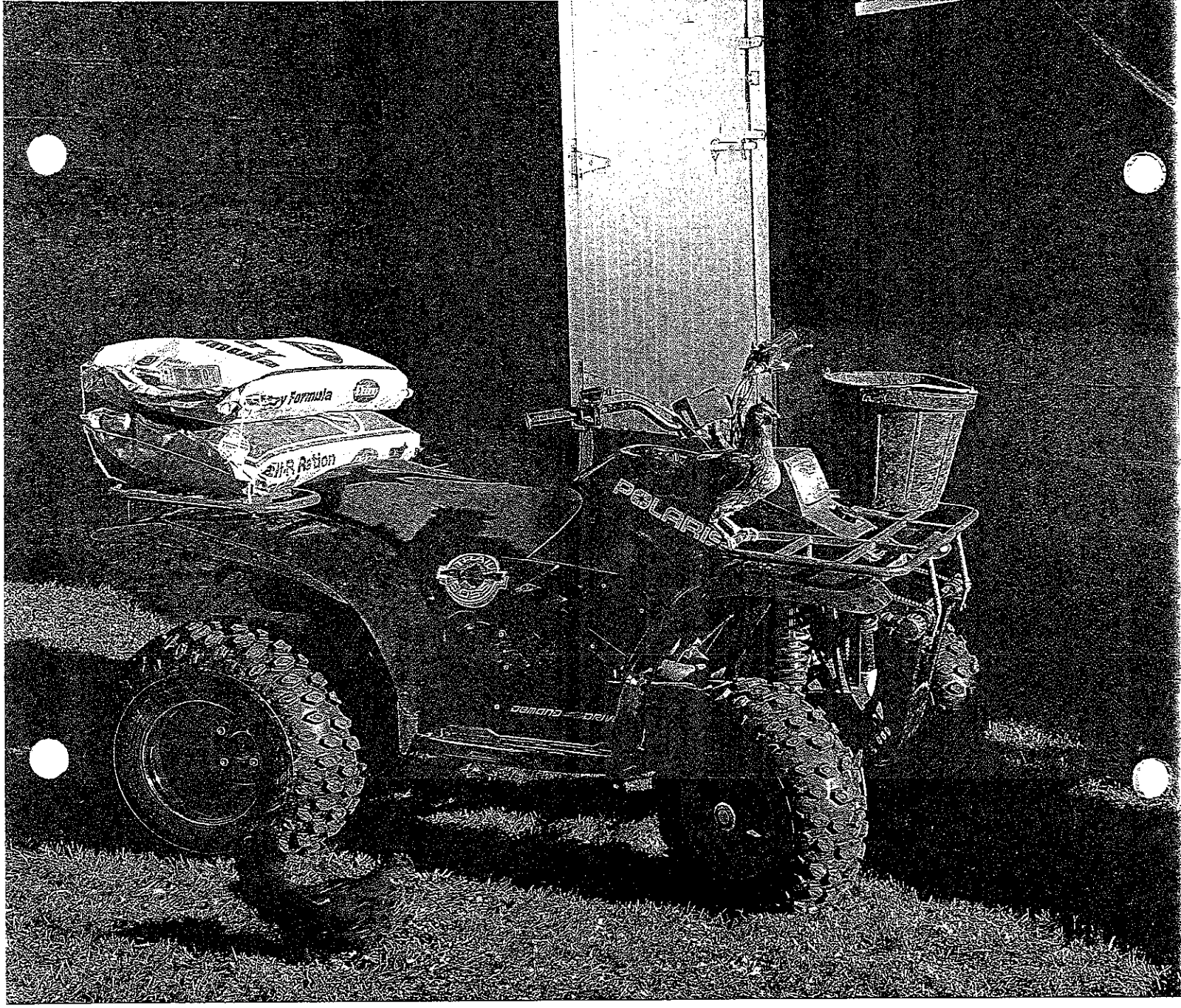
The Trail Boss 2x4 is a worker, with a 200-lb. payload, and 244cc's of oil-injected power delivered by a dual-range transmission.

This year, the Trail Boss 2x4 gets ETC (Electronic Throttle Control), and an auxiliary foot brake.

And its automatic PVT (Polaris Variable Transmission) and single-lever braking mean that, when you want to get someplace, you just let your hands do the work, instead of your feet.



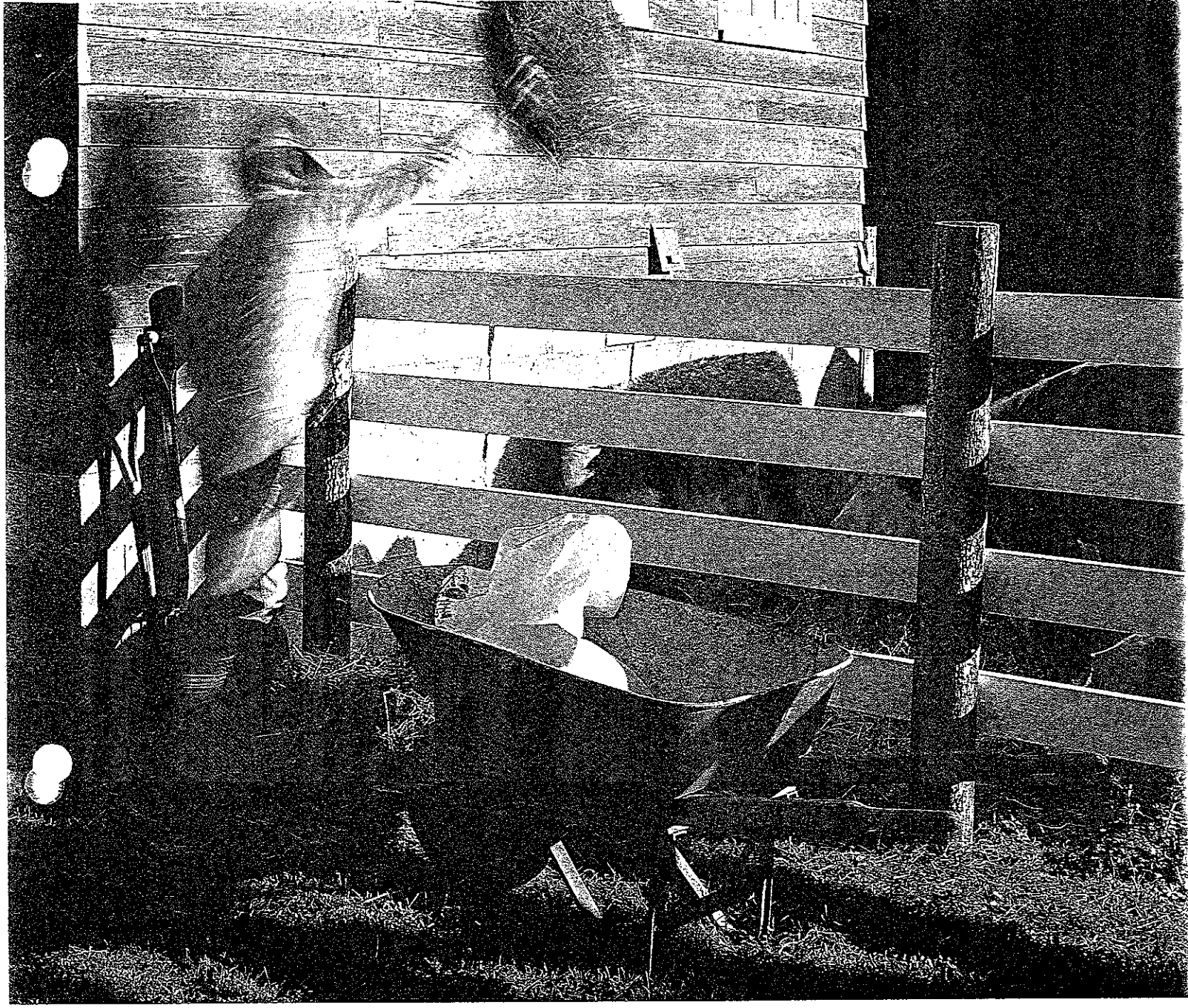
The Trail Boss 2x4 from Polaris: If the decision were up to your feet, you would have had one a long time ago.




# YOU'LL NEVER HEAR A TRAIL BOSS 4x4 COMPL

The Trail Boss 4x4 was designed with the needs of real-world adults like yourself in mind.

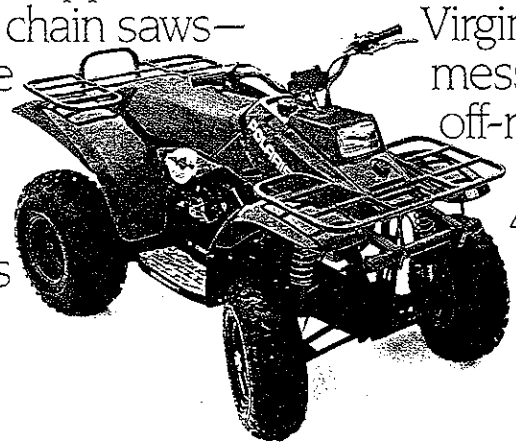
The Trail Boss 4x4 features a new electro-mechanical on-demand four-wheel drive system (flipping a switch takes you from full-time two-wheel to on-demand four-wheel drive), driven by a powerful 244cc engine. New this year are an auxiliary foot brake and ETC (Electronic Throttle Control). And of course the 4x4 features Polaris standards like automatic PVT (Polaris Variable Transmission), single-lever braking, and full floorboards



# I ABOUT HAVING TO WORK THROUGH LUNCH.

Can a Trail Boss 4x4 handle your work load? Ask the guy who used his to run supplies—pumps, water, hose, chain saws—up mountains to the front lines of the Great Yellowstone F...

And the Trail Boss 4x4 can play as hard as it works. Ask the farmer who entered himself and his Trail Boss 4x4 in West Virginia's legendary (and messy) Blackwater 100 off-road race—and won.



The Trail Boss 4x4: a real workhorse, for the real world.

## ADD MUSCLE TO YOUR WORK

The Polaris Big Boss 4x6 is your worker of choice when human hands, arms and backs aren't quite enough, but a pickup or dump truck is too much.

The Big Boss's cargo bed and four rear drive wheels make it the hardest-working utility vehicle you can buy. It carries up to 650 pounds, or 6.4 cubic feet, of cargo (13.68 cubic feet with the optional stake box sides). Two storage boxes can be removed for additional cargo space. The 244cc engine gives it an 850 lb. towing capacity. Dual front and triple rear hydraulic brakes make stopping a breeze. A backrest gives superior rider ergonomics. ETC (Electro. Throttle Control) limits engine

CO $2.5 \times 10^4 \frac{\#}{day} \times 3.65 \times 10^2 \frac{day}{yr} = 30 \times 10^3 \#/yr.$

Current

$2 \times 10^5 \cancel{veh} \times 200 \frac{\cancel{hr}}{yr} \times \frac{10 \cancel{hp}}{\cancel{veh}} \times 1 \frac{lb\text{-}fuel}{\cancel{hp\,hr}} \times \frac{16 \times lb\text{-}exh}{lb\ fuel} =$

$2 \times 10^7 \times 10 \times 16 = 3 \times 10^9 \frac{\#\text{-}exh}{yr}$

CO $\frac{10}{10^3} = 1\%$

$100\ g/hp\,hr = \frac{100}{450} \frac{lb\ CO}{hp\,hr}$

$\frac{1\ lb}{hp\,hr} \times \frac{16\ lb\ exh}{lb\ fuel} = \frac{16\ lb\text{-}exh}{hp\,hr}$

New reg $\frac{100/450\ lb\ CO}{16\ lb\ ex} = \frac{100}{7200} \sim$

OFRM

CO burden 10,000

HC burden 3000

NOx 3000

$.34/\#$

Motorcycle road tests - ?

Calculations by Dr. Wortman discussed with Bob Cross