

Environment Canada's *Gasoline Regulations*:
**A discussion paper on the potential extension of the exemption for leaded gasoline used
in competition vehicles**

May 2007

Introduction

Canada's *Gasoline Regulations* have prohibited the production, import and sale of leaded gasoline since 1990. Gasoline for use in competition vehicles has been provided an exemption under the regulations. The current exemption expires on January 1, 2008.

This discussion paper provides background information and seeks the views of parties regarding this issue. Specifically, Environment Canada is seeing comments on the following questions:

1. Should the present exemption for leaded gasoline used in competition vehicles be extended, and if it were to be extended, how long should it be for?
2. Do competition vehicles racing in Canada still need leaded gasoline?
3. What are the barriers to voluntary removal of leaded gasoline from the racing industry and are there any activities currently underway in this regard?
4. Should the existing exemption for farm equipment, boats and trucks over 3856 kg be removed?

The *Gasoline Regulations*

The *Gasoline Regulations*, promulgated under the Canadian Environmental Protection Act (CEPA), came into effect December 1, 1990. The Regulations, which assured the use of virtually lead-free gasoline in Canada, were enacted to address health concerns associated with low level exposure to lead.

Prior to the enactment of the Regulations, vehicular lead emissions, resulting from the combustion of lead-containing anti-knock agents, were the largest source of lead particulates in the Canadian atmosphere. The controls on lead in gasoline have significantly decreased airborne lead concentrations which, in turn, are thought to have resulted in reduced uptake and blood lead levels of Canadians.

The *Gasoline Regulations* prohibit the production, import or sale of leaded gasoline. There are exemptions allowing for leaded gasoline to be used in:

- competition vehicles (until January 1, 2008),
- aircraft, and
- engines designed to use leaded gasoline that power
 - tractors, combines, swathers or other farm machinery,
 - boats, or
 - trucks with a gross weight rating greater than 3856 kg.

A copy of the current regulations can be downloaded from the CEPA registry at <http://www.ec.gc.ca/CEPARegistry/regulations/detailReg.cfm?intReg=11>.

Exemption for Gasoline Used in Competition Vehicles

At the request of the racing industry, the Gasoline Regulations were amended in 1994, to alleviate adverse economic impacts of the Regulations on the industry. The amendments allowed for certain racing engines to use leaded gasoline. The original exemption expired on December 31, 1996.

Since then, further amendments were made as follows to extend the exemption:

- March 1997, the exemption was extended until December 31, 1997;
- March 1998, the exemption was extended for five years; and
- March 2003, the exemption was extended for another five years. (The current exemption expires January 1, 2008.)

Leaded gasoline used in competition vehicles

Gasoline is the most common fuel used in racing. Both leaded and unleaded gasoline formulations are used in Canadian racing. For engines with high compression ratios, a very high octane gasoline is required to prevent engine knock (and resulting engine damage) and to maximize power output. Lead additives are used to achieve this high octane. Leaded gasoline that is imported for use in Canada has reported lead contents ranging from 0.1 to 4.23 g/L.

The *Gasoline Regulations* have reporting requirements for anyone producing or importing leaded gasoline. The reports indicate that there is no Canadian production of leaded gasoline for use in competition vehicles. In 2005, 1,160 cubic meters of leaded gasoline was reported as imported for use in competition vehicles. This represents 1.1% of the leaded gasoline pool in Canada (the remaining is used for aviation purposes) or 0.003% of all gasoline produced or imported into Canada.

The estimated breakdown of leaded gasoline sales for racing in Canada is as follows:

- stock cars – 15 to 40%;
- dragsters – 40 to 50%;
- motorcycles – 10 to 20%; and
- others (boats, personal water craft, snowmobiles and go karts) – 5 to 10%.

During consultations on the 2003 amendments to the *Gasoline Regulations*, the racing industry explained that leaded gasoline was required for racing vehicles. For example, the President of the Valcourt Grand Prix pointed out that 35-40% of racers use leaded fuel. The Canadian Boating Federation indicated that approximately “15% of the classes use leaded fuels” and that “some of the very high compression engines can only use leaded fuels as in racecars”.

Racing Industry in Canada

There are a variety of different racing activities in Canada involving various vehicles such as autos, motorcycles, snowmobiles and boats. Associations representing the racing industry are varied and represent racing at many levels – regional, provincial, national and international. Auto racing events include such vehicles as stock cars, dragsters, go-cart, Indy and Formula One and take place on various types of racetracks and road courses. Stock car and go-cart races take place on oval tracks or road courses, of varying length and surface type with a varying number of cars participating. Road courses typically are used for big event races such as the Molson Indy in Montreal and Toronto. Drag races take place on drag strips which are straight line tracks, usually a quarter mile in length, and with varying width and surface type.

The type of fuel used at various racing events is normally dictated by the rules of the sponsoring race association. Most race associations specify the fuel composition and compliance requirements for their various race classes in their rule books. All types of racing (drag, stock, road, motorcycle, snowmobile) have some leaded gasoline use. Road races such as the Indy and Formula One do not use leaded gasoline (Indy cars run on ethanol, while Formula One cars run on gasoline). Examples of associations that permit leaded gasoline use are National Hot Rod Association (NHRA), the International Hot Rod Association (IHRA), Sports Car Club of America, and some motorcycle, boat and snowmobile associations.

Participation in racing events can vary. Large scale competitions that involve national or international racing association, such as the NHRA and IHRA, can draw in international competitors. Smaller scale, local competitions may have only regional involvement and if the track is located near the U.S. border, U.S. drivers may participate.

The number of Canadian racing facilities and tracks has remained relatively constant in Canada.¹ According to the National Speedway Directory's - Speedways Online², there are 116 oval track facilities and 42 drag strips distributed throughout Canada.

It is estimated that in 2001, racing events in Canada generated close to \$200 million in direct revenues and around 900 full-time equivalent jobs. In addition, the racing industry attracted approximately \$600 million in direct expenditures by non-local people to areas with racing facilities and events, including more than \$90 million from non-Canadian visitors. Total spending generated by the racing industry in Canada is estimated at \$1.15 billion per year.³

Leaded gasoline for Aviation use

Leaded aviation gasoline (avgas) has an ongoing exemption under the *Gasoline Regulations*. Avgas is used in small general aviation aircraft, specifically only in internal combustion aircraft engines with spark ignition (piston) engines. Jet and turboprop planes do not use this fuel. In 2005, imports and production of avgas totaled 104,134 cubic meters. This represents 98.9% of the leaded gasoline pool in Canada.

Aircraft engines using leaded avgas require high octane fuel, currently achievable only with lead additives. In the United States, research into an unleaded aviation gasoline blend has been ongoing since 1995 in coordination with the Federal Aviation Authority and the

¹ Personal correspondence with Allan E. Brown, editor and publisher of Speedways Online

² www.speedwaysonline.com

³ Economic Impacts of Eliminating the Exemption for Lead in Racing Fuels, ARC Applied Research Consultants, July 2002

Coordinating Research Council. It is uncertain whether a formulation will be found and certified for use before 2015.⁴ As such, Environment Canada is not proposing any changes to the provisions exempting aviation gasoline from the Regulations.

Leaded gasoline for use in farm equipment, boats and trucks over 3856 kg

The Regulations have an ongoing exemption for gasoline used in engines that power farm equipment (tractors, combines, swathers or other farm machinery), boats or trucks with a gross weight rating greater than 3856 kg that are designed to use leaded gasoline. However, there has been no reported use of leaded gasoline in recent years for these uses.

Health Considerations

The Gasoline Regulations were put in place to minimize the risks of exposure to lead. Health Canada advises that lead can cause neurocognitive effects in sensitive populations (infants and children) at blood levels below 10 µg/dL⁵. The controls on lead in gasoline have decreased airborne lead concentrations which, in turn, are thought to have resulted in reduced uptake and blood lead levels of Canadians.

In 1997, Environment Canada carried out a monitoring study for lead in ambient air and in soil at a drag strip and an oval racetrack. The data obtained were used by Health Canada to perform a risk assessment on exposure of spectators to lead. Health Canada found that the estimated lead intake for sensitive segments of the population (toddlers, adolescents, and pregnant women) was less than 50% of the World Health Organization's (WHO) Provisional Tolerable Weekly Intake (PTWI) and concluded that weekly lead exposures at both the drag and oval tracks were acceptable.

In 2003, Health Canada updated its 1997 assessment of the estimated weekly lead intake for a toddler as a spectator.⁶ Volume data gathered under the regulations had indicated a 37 percent increase in the volume of leaded fuels imported for competition vehicles from 1998 to 2002. The reassessment assumed an equivalent 37 percent increase in lead emissions. Health Canada concluded that the risk was acceptable since the estimated weekly lead exposures remained within the tolerable intakes developed by the WHO.

Health Canada remains concerned over the exposure of spectators and nearby residents to lead emitted at race tracks. Recent health studies have led to increased concern about the effects of lead exposures, especially among children. Intellectual and neurobehavioral effects are being detected at lower body lead burdens than were previously thought to be detrimental.

Import volume data received by Environment Canada under the regulations have shown increased volumes of leaded gasoline being imported for use in competition vehicles. Since the number of tracks has remained essentially constant over this period, it is likely that more

⁴ Personal communication with Dr. Tom Flournoy, Manager of Propulsion and Fuels Systems Branch, Federal Aviation Authority, February 2006.

⁵ This is the current blood-lead intervention level, a benchmark level, used by Canadian physicians to determine when action should be taken to mitigate risk or harm in individuals once exposure has occurred (under review by Health Canada).

⁶ Toddlers were assessed since they were identified as the most susceptible receptors.

events per tracks are taking place or more competitors are taking part in each event. In either case, the amount of lead being emitted at racetracks has increased in proportion to the increased in fuel being burned.

In 2006, Health Canada reviewed available information on the current use of leaded fuel in race cars including the US EPA's Air Quality Criteria for Lead (October 2006)⁷.

Health Canada concluded that current research suggests that even low-level exposures to lead resulting in blood lead levels below 10 µg/dL can affect neurobehavioral development in children, and given that the Canadian race car industry continues to grow, exposure to lead from competition vehicle emissions is deemed a significant contributor to overall lead exposure for people who live near to and/or attend racing car event, and is thus a cause for concern.

Controls on lead in gasoline for competition vehicles in other jurisdictions

Canada has an approach of generally aligning environmental fuel requirements with those of the United States, while taking into consideration environmental standards developed by the European Union.⁸

United States

The U.S. 1990 Clean Air Act Amendments (CAAA) prohibit the use of leaded gasoline in on-road vehicles. The CAAA includes an on-going exemption from the restriction for fuels for competition use vehicles.

The U.S. Environmental Protection Agency (EPA) has worked in a voluntary partnership with the National Association for Stock Car Automobile Racing (NASCAR) to remove alkyl-lead from their racing fuels. NASCAR has announced that it will use unleaded racing fuel starting in the spring, 2007. NASCAR has also just recently bought the Canadian Association for Stock Car Automobile Racing (CASCAR). Beginning in 2007, NASCAR will launch a racing series in Canada, using current CASCAR teams and drivers. Due to the differences in engine design (non NASCAR stock engines may have higher compression ratios) it is expected that stock cars in Canada will continue running on leaded gasoline.

European Union

The European Union prohibits the marketing of leaded petrol as outlined in EU Directive 98/70/EC. The Directive does not provide an exemption for leaded gasoline to be used in competition vehicles, but does allow small quantities (up to 0.5% of total sales) to be marketed for use in "old vehicles of a characteristic nature".

The United Kingdom's (UK) Motor Fuel Regulations 1999, which implements the EU directive, allows up to 100,000 tonnes (equivalent to approximately 139 million litres) of leaded gasoline to be distributed or sold. Leaded gasoline continues to be used in competition vehicles in the UK.

⁷ United States Environmental Protection Agency (2006) *Air Quality Criteria for Lead* Available at <http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=158823>

⁸ *Federal Agenda on Cleaner Vehicles, Engines and Fuels*, Canada Gazette, Part I, Vol. 135, No. 7, February 17, 2001.

Summary of Issues

Environment Canada is seeking the views of parties regarding potentially extending the exemption for leaded gasoline used in competition vehicles. Specifically, Environment Canada is seeing comments on the following questions:

1. Should the present exemption for leaded gasoline used in competition vehicles be extended, and if it were to be extended, how long should it be for?
2. Do competition vehicles racing in Canada still need leaded gasoline?
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Path forward

Parties are requested to provide their views in writing on the issues addressed in this discussion document to Environment Canada by June 11, 2007. Written comments should be mailed to:

Gasoline Regulations – Competition Vehicle Exemption
c/o Lorri Thompson
Fuels Section
Oil, Gas and Energy Division
Environment Canada
20th floor, 351 St. Joseph Blvd.
Gatineau, QC
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Comments may also be provided by e-mail to Lorri.Thompson@ec.gc.ca.