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Annotated Bibliography

The following resource materials provide information that may be of interest to those contemplating or implementing a lead in gasoline phase out. ILMC welcomes suggestions for additional materials to be included in the bibliography.

Overviews	
Title	"Costs and Benefits of Reducing Lead in Gasoline"
Author	Joel Schwartz, Hugh Pitcher, Ronnie Levin, Bart Ostro and Albert L. Nichols
Institution	US Environmental Protection Agency
Pages	387
Date	February 1985
Abstract	In conjunction with the US EPA rulemaking to reduce the amount of lead in gasoline to 0.10 gplg, this study assessed the overall costs and monetized benefits of reducing lead.
Title	"Phasing Out Lead from Gasoline: World-Wide Experience and Policy Implications"
Author	Lovei, Magda
Institution	World Bank
Pages	44
Date	August 1996
Abstract	This report reviews the current experience with lead phase out and the policy implications. It highlights the six elements of an effective phase out strategy.
Title	"The Benefits of Unleaded Petrol"
Author	Mowle, Michael G.
Institution	New South Wales State Pollution Control Commission
Pages	14 plus Figures and Tables
Date	September 1981
Abstract	This paper thoroughly reviews the benefits of a switch to unleaded fuel on emissions, fuel economy and maintenance. It concludes that significant net cost savings will result from the switch.

Title	"Role of Lead Antiknocks in Modern Gasolines"
Author	Bettoney, Pahnke &
Institution	Society of Automotive Engineers
Pages	23
Date	1971
Abstract	The role of lead antiknocks is discussed with particular emphasis on exhaust emissions, engine cleanliness, valve seat recession, octane requirements and octane requirement increase.
Title	"The Elimination of Lead From Gasoline"
Author	Thomas, V.M
Journal	Annual Review of Energy and the Environment
Volume	20
Pages	24
Date	1995
Abstract	This paper reviews the reasons for phasing lead out of gasoline, the then current status, the costs and the concerns with vehicles with soft valve seats.
Title	"The Advantages of Removing Lead From Gasoline and Using Catalytic Converters to Control Vehicle Exhaust Pollution"
Author	Walsh, M.P.
Pages	44
Date	October 1983
Abstract	This paper reviews the impact of unleaded gasoline and catalytic converters on vehicle emissions.
Title	"Global Opportunities for Reducing The Use of Leaded Gasoline"
Author	(IOMC), Inter-Organization Programme For The Sound Management of Chemicals
Pages	59
Date	September 1998
Abstract	This report provides a brief overview of the health consequences of lead exposure, the importance of leaded gasoline as a source of this exposure, and how to overcome the potential barriers to eliminating its use.
How To Phase Out Lead In Gasoline	
Title	"Issue Paper: Phasing Lead Out Of Gasoline – The Experience With Different Policy Approaches in Different Countries"
Author	Walsh, Michael P.

Institution	United Nations Environment Program/Organization For Economic Cooperation & Development
Date	1999
Abstract	Various approaches to phasing out the use of leaded gasoline are reviewed and conclusions drawn regarding the respective merits of each.
Title	"Harmonization of Fuels Specifications in Latin America and the Caribbean"
Author	Alconsult
Institution	World Bank
Pages	51 plus Annexes
Date	January 1998
Abstract	Specifications of key parameters for gasoline, diesel, LPG and light fuel oils are proposed. Issues considered when developing the specifications include investment requirements, effects on current vehicle fleet, current inter regional trade, and on air quality, as well as sensitive geopolitical issues such as national supply security and the perspective of smaller/older refineries in some countries.
Energy Impacts	
Title	"The rational utilization of fuels in private transport (rufit) - extrapolation to unleaded gasoline case"
Author	CONCAWE
Institution	CONCAWE
Pages	23
Date	August 1980
Abstract	The purpose of the RUFIT study was to look at the gasoline engined motor vehicle and European refineries as a single integrated system with the Research Octane Number as the link, taking into account the range of possible restrictions on the use of lead additives.
Title	"Assessment of the energy balances and economic consequences of the reduction and elimination of lead in gasoline"
Author	CONCAWE
Institution	CONCAWE
Pages	49
Date	December 1983
Abstract	This report gives details of a study carried out at the request of the EEC Working Group: Evolution of Regulations - Global Approach (ERGA) to predict the optimum octane number for unleaded gasoline which will minimize total energy consumption.

Title	"A Before and After Study of the Change to Unleaded Gasoline - Test Results from EPA and Other Cycles"
Author	Harry C. Watson, Eric E. Milkins, Steve Lansell and Ken Challenger
Institution	University of Melbourne
Report Number	SAE # 900150
Pages	23
Date	February 26, 1990
Abstract	This report reviews the real world impact of a switch to unleaded fuel on emissions and fuel consumption under a variety of driving conditions.
Health Concerns With Lead	
Title	Lead In the Americas: A Call for Action
Pages	210
Date	1996
Publisher	Committee to Reduce Lead Exposure In The Americas, Board of International Health Institute of Medicine, in collaboration with The National Institute of Public Health, Cuernavaca, Morelos, Mexico
Editor	C. P. Howson, Mauricio Hernandez-Avila and David P. Rall
Series Editor	Christopher P. Howson; Hernandez-Avila, Mauricio; Rall, David P.
Abstract	This report summarizes a three day conference which was held in Washington, DC during the period from 8-10 May, 1995. Chapter 1 summarizes the findings, conclusions and recommendations of the symposium participants for the prevention of lead poisoning in the Americas. Chapter 2 describes the history of public health concerns about lead poisoning and the voluntary and regulatory steps taken to reduce human lead exposures. Chapter 3 provides summaries of the plenary sessions presentations and Chapter 4 summarizes the findings of the six working groups.
Title	"Preventing Lead Poisoning in Young Children
Author	Center for Disease Control, US
Institution	US department of Health and Human Services, Centers for Disease Control
Pages	105
Date	October 1991
Abstract	This is the fourth revision of the statement on Preventing Lead Poisoning in Young Children by the Centers for Disease Control.

Title	Human Exposure to Lead (Series Title: Human Exposure Assessment Series)
Author	WHO
Pages	216
Date	1992
Publisher	United Nations Environment Programme, United States Environmental Protection Agency and the World Health Organization
Abstract	This text was prepared under the WHO/UNEP Human Exposure Assessment Location (HEAL) Programme and forms the report on the HEAL Coordinators meeting held in Bangkok, Thailand from 16 to 20 November 1992.
Title	"Risk Reduction Monograph No. 1: Lead"
Author	Development, Organization for Economic Cooperation and
Institution	Organization for Economic Cooperation and Development
Pages	277
Date	1993
Abstract	The main purposes of this document on lead risk reduction are: (1) to provide a summary of information regarding releases of lead to the environment, the ensuing environmental and human exposures, and the way OECD member countries and countries with observer status perceive the risks associated with exposure to lead; (2) to describe the actions those countries and industry have taken, or contemplate taking, to reduce risks associated with exposure to lead, and (3) to identify the benefits, in terms of protection of human health and the environment, that could result from taking such actions, to the extent that information is available.
Title	Environmental Health Criteria 165: Inorganic Lead
Volume	165
Pages	300
Publisher	United Nations Environment Programme, International Labour Organization and the World Health Organization
Editor	Safety, International Programme on Chemical
Abstract	This monograph focuses on the risks to human health associated with exposure to lead and inorganic lead compounds.
Title	"Automotive Emissions of Ethylene Dibromide"
Author	Sigsby, Dropkin, Bradow and Lang

Institution	US EPA & Northrop Services
Pages	17
Date	June 1982
Abstract	Ethylene dibromide (EDB) is commonly used as a scavenger to prevent lead deposit build up on spark plugs. This paper presents test data from vehicles operating on leaded gasoline with EDB. Health effects of EDB are also reviewed.
Gasoline As A Source of Lead Exposure	
Title	"Isotopic Lead Experiment: A Dynamic Analysis of the Isotopic Lead Experiment Results"
Author	Fantechi, A. Colombo and R.
Institution	Commission of the European Communities, General Directorate XII
Pages	26
Date	October 1983
Abstract	This report studies by mathematical modeling the dynamic evolution of the blood lead isotopic ratio ($^{206}\text{Pb}/^{207}\text{Pb}$) of three groups of subjects from Turin and from near and far countries. Through the comparison of the experimental evolutions with those given by the model, it aims at ascertaining whether an analysis of all the blood lead isotopic ratio data covering the 1975-1979 ILER period could support the percentages of local petrol lead impacting on blood estimated in the ILE report.
Title	"The Relationship Between Gasoline Lead Usage and Blood Lead Levels in Americans: A Statistical Analysis of the NHANES II Data"
Author	ICF Incorporated, under contract to the US EPA
Institution	US EPA
Pages	53
Date	December 1982
Abstract	The results presented in this report were obtained by applying sophisticated statistical techniques to extensive sets of data. Several regression models were fit to the more than 10,000 observations on blood lead levels gathered during the Second National Health and Nutrition Examination Survey (NHANES II).
Valve Seat Recession	
Title	"Effect of Low Levels of Lead and Alternative Additives To Lead On Engines Designed To Operate on Leaded Gasoline"

Author	Allsup, Jerry R.
Institution	United States Environmental Protection Agency, Office of Mobile Sources
Pages	190
Date	March 1987
Abstract	This report describes testing operations to determine the effect of using leaded gasoline, low-lead gasoline, unleaded gasoline and gasoline with additives in engines designed for leaded gasoline.
Title	"Report to the President and Congress on the Need for Leaded Gasoline on the Farm"
Author	Agency, United States Environmental Protection
Pages	52 Plus Appendices
Date	October 1988
Abstract	This report carefully reviews the need for leaded gasoline to prevent valve seat recession in farm equipment operating under sustained heavy loads. It also review alternative strategies to minimize or prevent any valve damage risk.
Title	Fourth Meeting of the Task Force on the Phase-out of Lead in Gasoline - Final Report Presenting the Results of the Car Park Study"
Author	Agency, Danish Environmental Protection
Institution	Danish EPA
Pages	26 plus Appendix
Date	January 1998
Abstract	This report focuses on the question of whether vehicles produced in the Central and Eastern European countries can operate satisfactorily on unleaded gasoline.
Title	"Prevention of Valve-Seat Recession in European Markets"
Author	J.S. McArragher, L.J. Clarke and H. Paesler
Institution	Shell
Pages	9 plus Tables & Figures
Date	May 1993
Abstract	This report reviews both published and in house data on valve seat recession to examine the effect of engine operating conditions, the minimum lead content necessary to prevent valve seat recession and the effectiveness of alternative additives.
Title	"Effects of Using Unleaded and Low Lead Gasoline, and Non Lead Additives on Agricultural Engines Designed For

	Leaded Gasoline"
Author	Agriculture, US Environmental Protection Agency & US Department of
Pages	80
Date	April 1987
Abstract	This report assesses the need for lead or other additives to protect valves in engines with a heavy duty cycle and which had been designed for use with leaded gasoline.
Title	"Durability test of catalyst vehicles run on unleaded gasoline with sodium additive."
Author	Laveskog, Anders
Institution	Motortestcenter
Pages	10 plus Appendices
Date	June 1992
Abstract	This report reviews the experience with the use of a sodium based additive, designed to prevent valve seat recession with unleaded fuel. The particular focus is the impact on catalyst deterioration over extended mileage.
Title	"An Engine's Definition of Unleaded Gasoline"
Author	Doelling, Ralph P.
Institution	Society of Automotive Engineers
Pages	8
Date	October 26-29, 1971
Abstract	An engine program designed to investigate the effect of varying gasoline lead levels upon changes in hydrocarbon exhaust emissions levels resulting from combustion chamber deposits and valve recession was extended to very low lead levels. The results of this program, define the amount of lead a fuel may contain before lead deposit effects on emissions are observed and valve recession problems are eliminated as falling between 0.04-0.07 gm/gal.
Title	"A Review of Worldwide Approaches to the Use of Additives to prevent Exhaust Valve Seat Recession"
Author	Russell, M.W. Vincent and T.J.
Institution	Associated Octel Company Limited
Pages	17 plus Figures and Tables
Date	January 1998
Abstract	This report reviews the problem of valve seat recession and the use of fuel additives to control it.
Older Vehicle Emissions Control Options	
	Issue Paper: Older Gasoline Fueled

Title	Vehicles in Developing Countries or in Economies in Transition – Their Importance and the Policy Options For Addressing Them
Author	Walsh, Michael P.
Institution	United Nations Environment Program/Organization For Economic Cooperation and Development
Date	1999
Abstract	Older vehicles are a disproportionate source of vehicle related air pollution in many countries. This study reviews the potential of many strategies, such as Inspection and Maintenance, Mandatory Scrappage, Retrofit, Fuel Conversion, etc., to reduce this excess pollution.

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