Engines and Electrics

(381 part 2 including Applied Studies)

Editor Roy Brooks

Name.
College
Employer

[illegible]

Macmillan Motor Vehicle Craft Studies Series

Engines and Electrics

(381 part 2 including Applied Studies)

Editor	Roy Brooks Senior Lecturer in Motor Vehicle Subjects Bolton Institute of Higher Education
Author	Jack Hirst Lecturer in Motor Vehicle Subjects Burnley College of Arts and Technology Examiner in Motor Vehicle Subjects to the West Midlands Advisory Council for Further Education and to the Union of Educational Institutions

M

© Roy Brooks and Jack Hirst 1982
Softcover reprint of the hardcover 1st edition 1982 978-0-333-34643-3
All rights reserved. No part of this publication may be reproduced or transmitted,
in any form or by any means, without permission.

First published 1982 by
THE MACMILLAN PRESS LTD
London and Basingstoke
Companies and representatives throughout the world

ISBN 978-1-349-06642-1 ISBN 978-1-349-06640-7 (eBook)
DOI 10.1007/9781349066407

The paperback edition of this book is sold subject to the condition that it shall not, by way
of trade or otherwise, be lent, resold, hired out, or otherwise circulated without the
publisher's prior consent in any form of binding or cover other than that in which it is
published and without a similar condition including this condition being imposed on the
subsequent purchaser.

Contents

	<i>Technology</i>	<i>Applied Studies</i>
Preface		
Acknowledgements		
Engines	1	53
Lubrication	84	92
Fuel systems (petrol)	98	124
Fuel systems (compression-ignition)	126	152
Ignition	153	166
Emission control	169	174
Cooling	175	187
Electrical systems	190	221

The contents follow, as far as practicable, the order of the City and Guilds syllabus. This may not always be the best teaching/learning sequence, but it ensures a uniformly understandable order of presentation.

The publishers will be happy to suggest an effective scheme of work based on page numbers.

PREFACE

This book deals with the engines and vehicle electrical components as required by syllabus 381 part 2 Light and Heavy Vehicle Mechanics, 'Engines and Electrics'. The author has wide experience in these fields and was primarily responsible for covering the same topic areas in the earlier highly successful books in the Macmillan Motor Vehicle Craft Studies Series. He is also a well-known and respected examiner.

As before, the requirements of the City and Guilds syllabus have been faithfully followed, and the book's aim is to save both student and teacher time in coping with the demands of a necessarily full syllabus.

Obviously, the maximum benefit will be obtained from this book if it is used in conjunction with its companion volume, *Transmission, Chassis and Materials*, by John Whipp. Anyone conscientiously completing these two books should easily pass the examinations in these topic areas.

The book is suitable for both Light and Heavy vehicle mechanics, since substantial areas of their work overlap. Where divergences do occur, such sections can be omitted — each section has a precise syllabus reference in the margin.

While wishing every success to those who use the books in this series, the authors and editor realise that improvements are always possible. Constructive comments are welcome. Please send them via the publishers — they will be most carefully considered.

Roy Brooks

ACKNOWLEDGEMENTS

A—C Delco Division of General Motors Ltd	Honda UK Ltd
Audi NSU Auto Union AG	Lotus Group of Companies
BL Ltd	Joseph Lucas Ltd
Robert Bosch Ltd	Lumenition Ltd
The British Petroleum Company Ltd	Mobelec Ltd
The British Standards Institution	Mobil Oil Company Ltd
CAV Ltd	Perkins Engines Ltd
Champion Sparking Plug Company Ltd	Renault (UK) Ltd
Crypton-Triangle Ltd	Ripaults Ltd
Cummins Engine Company Ltd	Smiths Industries Ltd
Datsun UK Ltd	Solex UK Ltd
Alexander Duckham & Company Ltd	SU Butec
Fiat Auto (UK) Ltd	Suntester Ltd
Ford Motor Company Ltd	Talbot Motor Company Ltd
General Motors Ltd	VAG (United Kingdom) Ltd
Halls Gaskets Ltd	Vauxhall Motors Ltd
Leslie Hartridge Ltd	Villiers
Hepworth & Grandage Ltd	Weber Carburettors UK Ltd
Holset Engineering Company Ltd	

The motor vehicle staff of Burnley college