LIGHT VEHICLE
DIESEL ENGINES

James D. Halderman
Curt Ward
This new title is designed to meet the needs of a semester course in light vehicle diesel engines. This title is designed to be the “keystone” course for an automotive program because it includes all of the advanced technology in on-board diagnosis and up-to-date diesel technology all in one title.

DEPTH OF CONTENT AND FORMAT
Scope: The scope of this title is intended to meet the needs of a textbook that covers light vehicle diesel engines to supplement and enhance an automotive two-year curriculum. The first 9 chapters are designed to introduce diesel engine construction and engine mechanical systems. Chapters 10 through 21 cover the emission control and service procedures that every technician needs to know when servicing a light vehicle diesel engine. Chapters 22 through 25 cover each of the most commonly used diesel engines in detail.

Organization: The content includes the basics needed by all service technicians and also covers the following organization for most systems:

- Purpose and function of the system
- Parts involved and operational description
- Diagnosis and service

ASE A9 CORRELATED This text material meets all of the tasks specified by ASE for the Light Diesel (A9) test content area. The correlation to both the text pages and the task sheet are found in appendix 2.

A COMPLETE INSTRUCTOR AND STUDENT SUPPLEMENTS PACKAGE All Professional Technician textbooks are accompanied by a full set of instructor and student supplements. Please see page vi for a detailed list of supplements.

A FOCUS ON DIAGNOSIS AND PROBLEM SOLVING The Professional Technician Series has been developed to satisfy the need for a greater emphasis on problem diagnosis. Automotive instructors and service managers agree that students and beginning technicians need more training in diagnostic procedures and skill development. To meet this need and demonstrate how real-world problems are solved, Case Studies features are included throughout and highlight how real-life problems are diagnosed and repaired.

The following pages highlight the unique core features that set the Professional Technician Series book apart from other automotive textbooks.
The Case of Erratic Electrical Symptoms

The owner of a 2010 Dodge Truck with a 6.7-liter Cummins engine complained of a noticeable change in the level of the interior or exterior lighting, as well as the speed of the blower motor.

The owner stated that this situation occurred just after starting the truck. The service technician was able to verify the customer concern and monitored the battery voltage using a scan tool to confirm what the technician thought was happening. The intake heaters on the Cummins 6.7 draw so much current that the battery voltage is reduced, causing the dimming of the interior lights and the blower motor to turn slower than normal. The intake manifold heaters may continue to run for several minutes after the vehicle has started. No repairs were made and the customer was informed as to why this situation was occurring.

Summary:
Complaint – Customer complained that the interior lights were dimmer than normal shortly after starting the engine.
Cause – The battery voltage was reduced by the high amperage draw of the intake heaters.
Correction – No repairs were needed and the customer was informed that this was a normal condition on this diesel pickup.

FREQUENTLY ASKED QUESTIONS

Why Check DTCs before Checking TSBs?
DTCs must be known before searching for service bulletins because bulletins often include information on solving problems that involve a stored diagnostic trouble code (DTC).
NOTE: Push on the rubber (elastomer sleeve) of the vibration damper with your fingers or a pencil. If the rubber does not spring back, replace the damper.

NOTES Notes are included to point out a fact or situation that will help the reader better understand a specific task or procedure.

CAUTION: Some bearings may have oil holes in the top shell only. If these are installed incorrectly, no oil will flow to the connecting or main rods, resulting in instant engine failure. To help the oil spread across the entire bearing, some bearings use an oil groove.

CAUTIONS Cautions are stated whenever there is a possibility that the service being performed could result in damage to the vehicle or property if not done according to the procedure published in the service information.

WARNING The cast-iron Cummins inline six-cylinder head is very heavy, requiring an engine hoist to remove it from the block. Attempting to lift the head without help or a hoist could result in personal injury.

WARNINGS Warnings are stated when there is a possibility that personal injury could result if the service work is not done according to the procedure published in the service information.

THE SUMMARY, REVIEW QUESTIONS, AND CHAPTER QUIZ at the end of each chapter help students review the material presented in the chapter and test themselves to see how much they’ve learned.

STEP BY STEP These photo sequences show the breakdown of the Duramax diesel engine (Chapter 23), the Cummins 6.7 liter six cylinder engine (Chapter 24), and the 3.0 liter Fiat Chrysler V-6 diesel engine (Chapter 25).
# RESOURCES IN PRINT AND ONLINE

*Light Vehicle Diesel Engines*

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All online resources can be downloaded from the Instructor's Resource Center: www.pearsonighered.com/irc
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