



# Precision Truck Training

Technical & Product Training  
for the Ford Sales Consultant

## Course I Ford Light Trucks

By James E. Godfrey  
and Robert J. Godfrey

Second Edition — June, 2004

**TMI**

Career-builder training by  
Truck Marketing Institute

100 ft

**First Edition – 2001**  
**Second Edition – 2004**

PREVIOUSLY PUBLISHED AS  
*Precision Truck Selling*  
*Course I*  
*Ford Light Trucks*

Copyright © 2004

by

**Truck Marketing Institute**  
1090 Eugenia Place  
Carpinteria, California 93013-2011  
Phone: 1-805-684-4558  
Fax: 1-805-684-2868  
Web: <http://www.TruckMarketingInstitute.com>

All Rights Reserved

Printed in the U.S.A.

# Contents

<b>Introduction</b>	<b>3</b>	Foreword
	<b>4-6</b>	Contents
	<b>7</b>	Objective: Being a Truck Professional
	<b>7</b>	Summary of Lessons
	<b>8</b>	Truck Marketing Institute: Mission Statement
	<b>9</b>	How to Study Effectively
	<b>10</b>	“What if I Get Stumped?”
	<b>11</b>	Taking the Tests
	<b>11</b>	Grading Policy: What is a Good Score?
	<b>12</b>	Six Month Enrollment Term
	<b>12</b>	Employer Follow-Up
	<b>12</b>	To Mail or to Fax?
	<b>13</b>	Group Study Policy
	<b>14</b>	Score Card
	<b>15-16</b>	Course Evaluation Survey
<hr/>		
<b>Lesson: 1</b>	<b>17</b>	The Light Truck Market
	<b>18</b>	Truck Popularity: Why?
	<b>19-23</b>	Light Truck Categories
	<b>23</b>	Incomplete or Special Models
	<b>24</b>	Chassis Drive Types
	<b>25</b>	“Just Give Me a Half-Ton Truck!”
	<b>25</b>	Getting Acquainted: The Ford Truck Source Books
	<b>27</b>	Source Book Review: Rangers
	<b>27</b>	Cabs, Bodies and Wheelbases
	<b>28</b>	Ford Trucks: A Profile

---

<b>Lesson: 2</b>	<b>29</b>	The Source Books: Phase II
	<b>30</b>	Reference: From Audio to Tech-Specs
	<b>31</b>	Competitive Truck Comparisons
	<b>31</b>	Interior and Exterior Trim
	<b>32</b>	Truck Weight Ratings
	<b>34</b>	Put to the Test: GAWRs and GVWR
	<b>35</b>	Curb Weight Information
	<b>35</b>	Calculating Equipped Curb Weights
	<b>37</b>	Maximum Payload: GVW Equals GVWR
	<b>38</b>	Coming Attractions: Weight Distribution
	<b>38</b>	Basic Truck Dimensions
	<b>39</b>	Electrical System Basics
	<b>41</b>	Source Book Review: F-150 to Super Duty F-550

---

<b>Lesson: 3</b>	<b>43</b>	Introduction to Truck Weight Distribution
	<b>44</b>	Weight Distribution and the Tippy Bench
	<b>47</b>	Weight Distribution Simplified
	<b>48</b>	Chassis-Cabs: Guide to Body Combinations
	<b>50</b>	Matching Truck to Payload Weight
	<b>51</b>	Weight Distribution: The Loaded Truck
	<b>52</b>	Understanding Load Capacity
	<b>52</b>	Frame Strength Means Truck Strength
	<b>53</b>	Section Modulus
	<b>54</b>	Yield Strength
	<b>54</b>	Resisting Bending Moment
	<b>55</b>	Frames and Special Bodies
	<b>56</b>	Axles and Axle Systems
	<b>57</b>	Rear Axle Information
	<b>58</b>	Springs and Spring Ratings
	<b>59</b>	Shock Absorbers and Stabilizer Bars
	<b>60</b>	Tires and Wheels
	<b>63</b>	Brake Systems
	<b>63</b>	Gross Axle Weight Ratings
	<b>64</b>	Source Book Review
	<b>65</b>	Equipment Add-On Weights

---

<b>Lesson: 4</b>	<b>68</b>	Truck Owners: The Performance X-Factor
	<b>68</b>	Introduction to Light Truck Engines
	<b>69</b>	Alternative Fuel Vehicles: The Basics
	<b>70</b>	Available Engines—SUVs and Light Trucks
	<b>70</b>	Fuel Injection versus Carburetion
	<b>71</b>	Naturally Aspirated versus Turbocharged
	<b>71</b>	Diesel versus Gasoline Types
	<b>72</b>	Back to Basics: Torque
	<b>72</b>	Engine Power Depends on Torque
	<b>73</b>	More Basics: Horsepower
	<b>74</b>	Axle Ratios and Performance
	<b>75</b>	Low versus High Axle Ratios
	<b>76</b>	Transmissions: Making it Happen
	<b>77</b>	Manual Transmissions
	<b>78</b>	Automatic Transmissions
	<b>79</b>	Power: Where Does it Go?
	<b>81</b>	Truck Performance: Trailer Towing
	<b>86</b>	Harnessing the Horsepower
	<b>87</b>	The Power Robbers: Heat and Altitude
	<b>87</b>	Source Book Review: Powertrains

---

<b>Lesson: 5</b>	<b>89</b>	Sport Utilities: Another Look
	<b>91</b>	All-Wheel Drive: Explorer
	<b>91</b>	4x4 Basics
	<b>91</b>	Locking Hubs and Differentials
	<b>92</b>	Trailer with Trucks
	<b>92</b>	GVW, GTW and GCW
	<b>93</b>	Trailer Tongue Weight Distribution
	<b>93</b>	Load Distribution: Dead Weight Hitch
	<b>95</b>	Weight Distributing Hitches
	<b>96</b>	The Four Trailer and Hitch Classes
	<b>97</b>	What About Towing Capacity?
	<b>97</b>	Trailer Power Demands and the X-Factor
	<b>97</b>	Fifth Wheel Trailer Hitches
	<b>98</b>	Towing Fifth Wheelers: Gross Weight Factors
	<b>99</b>	PTO: What is it?
	<b>100</b>	Dump Trucks: Defining the Limits
	<b>102</b>	Diesel Engines: Power for Tough Jobs
	<b>102</b>	Diesels: They Don't Perform Miracles
	<b>103</b>	How Much Will a Diesel Save ?
	<b>103</b>	Vocations for Diesel Power
	<b>104</b>	Trucks, Safety and the Environment
	<b>105</b>	Source Book Review
	<b>106</b>	It's Cross Roads Time

# Introduction

## Objective: Being a Truck Professional

Whether you sell trucks or operate trucks for a living, you will be more successful if you can listen to your customers, find out what their needs are, and then give them choices that reflect your professional experience.

Helping to establish your credibility as a truck professional is the objective of Precision Truck Training: Course I. Through this course, you will find that your confidence has increased because you've got a good dose of truck fundamentals filed away for use when you need it.

The light truck market is huge and the buyers are many and different. Overall, however, they buy trucks because they perceive trucks will do something for them that cars can't. So, selling professionally means that YOU can recommend the right truck for the right buyer, the first time, and every time!

## Summary of Lessons

The objective of Precision Truck Training: Course I is summarized by the previous paragraph. To achieve that overall objective, we have split the course into five lessons, covering a variety of subjects, each with its own objectives. Here is a summary of what each lesson is about:

**Lesson 1.** Understanding the light truck market. Why is there value in trucks? What are the basic truck model types and where do Ford truck models fit in. How are Ford truck models identified? Do “ton ratings” mean anything? What's a 4x4, 4x2, or an AWD? Where is what in the product Source Books.

**Lesson 2.** More in-depth training on the Truck Source Book. Why GAWR, GVWR and payload capacities are important. How to find chassis weights and calculate payloads. Preferred Equipment and Payload Packages? What are the significant truck dimensions?

**Lesson 3.** How to distribute payloads to the front and rear axles. What are the important frame types and ratings? What are the different types of front and rear axles and their suspensions? How are axle weight ratings calculated and why are they important? What are the different types of tires and how much can they carry?

**Lesson 4.** Describe the basic types of engines used and the different fuels they operate on. What is a turbocharger? Explain the difference between torque and horsepower and be able to figure how much power is needed. How do axle ratios affect performance? How to express performance in gradeability terms.

**Lesson 5.** The sport utilities: Escape, Explorer, Expedition, Excursion. What is a 4x4 and how does it compare to all wheel drive? Trailing: What do the trailing terms GCW, GTW, and tongue weight mean? What are load distributing and ball hitches? Where do you find recreational vehicle information? Diesel power: What are the markets for diesels? How fast can the extra investment pay off.

## Truck Marketing Institute: Mission Statement

Truck Marketing Institute was founded in 1964 to write specialized training courses for those who sell and operate trucks. Our mission is to deliver up-to-date training programs that will substantially increase the sales engineering skills of not only truck sales representatives, but also those personnel in related fields of fleet purchasing, finance, leasing and operations.

The seal identifies Truck Marketing Institute as an accredited member of the Distance Education and Training Council. As an accredited member, you can be assured that we meet these rigid guidelines: Qualified faculty and staff. Careful admission screening. Reasonable tuition. Courses that have educational value. Honest advertising practices.



In using the three step study method, your first scanning will pick up paragraph headings, illustrations and subject highlights. Next, in reading for understanding, go as quickly as you can but with the purpose of trying to understand what is being written. In the third reading, you can hit the points that gave you some trouble. If you put a question mark next to some topic during your second reading, be sure to go back and figure it out.

## “What if I Get Stumped?”

There are going to be times when you just don’t understand something. You may find yourself questioning something in the Source Book that doesn’t look right. If that happens, give us a call to see if we can help.

Our Monday to Friday hours are 8:00 am to 4:30 pm Pacific time. We normally close on Post Office holidays. If your instructor is not in when you call, please leave your name, your student number and your question. We’ll get back to you as soon as possible.

We’ll try to clear up your confusion and point you in the right direction. But when it comes to test questions, don’t expect us to give you the answers! Rather, we will explain the method to reach the answer. There are a few students who would rather call us than read the lesson. When we sense that, we try to be gentle and encourage them to read first and call us later.

If you need to call, just remember that we’re in California, so there may be a time difference. If you want to pay a visit and see the Pacific Ocean from Carpinteria, come on out! We are located 85 miles up the coast from Los Angeles, on U.S. Highway 101 between the cities of Ventura and Santa Barbara.

***TMI Headquarters  
1090 Eugenia Place  
Carpinteria, CA  
Ph. (805) 684-4558  
Fax (805) 684-2868***

---



## Taking the Tests

You're not finished with a lesson until you have taken the test prepared for that lesson. Each test is designed to review material covered in this textbook as well as referenced material in your Source Book. A test for each lesson is placed in the pocket of each textbook binder.

We are a school, and as such, a test is a test! But that does not mean that we expect you to remember all facts and figures. That is why the test is set up so that you are expected to refer to your Source Book and textbook to arrive at the answers.

Do your studying before taking the test. That sounds basic, but we know a small number of students would like to take the quick way out by starting the other way around. That's an easy way to receive an unsatisfactory test grade.

## Grading Policy

Our requirements for completion are simple. First, you must successfully complete all five tests. Second, you have to score at least 75% on each test. Third, your overall average must be 80% or better.

If you score below 75% on a test, it will be returned to you so you may rework it. If the instructor feels you were probably just too rushed, you will be instructed to take a bit more time and reread the lesson. You may also be given some suggestions about specific references to review before completing the test.

Your maximum score on a reworked test is 90%. If you fail it twice, we may ask you to try a third and final time and we will award you a score of 75% for passing work.

## What is a Good Score?

Since the tests are open book and the material is relatively easy, you should expect fairly high scores. On the other hand, point values on individual questions can vary from two to five or more points, so you can also lose them in a hurry!

If you can score 95% or better, we would call that an "A" score. Down to 90% would be a "B" while a "C" effort could hit 85%. Below that, you really are in the "danger zone" and should think about working just a little harder!

## Six Month Enrollment Term

While you may be able to study at your own pace, that doesn't mean we're going to let you take ten years to finish this course! We have assigned a six month enrollment term for this course and that has been plenty of time for most students. After all, it is only five lessons and can be finished in under 25 hours. If you run out of time, we can grant additional time to finish.

## Employer Follow-Up

The vast majority of enrollments are paid for by employers, and they consider these materials to be their property. As such, if you leave, they have the right to transfer the course to another employee for a fee that consists of a registration fee plus charges for completed tests, textbook, etc.

Because this is employer paid training, most of them want to be notified when you don't send in a test for more than 30 days. Normally, we'll send you a note at the 30 day point. After that, we have to notify your employer. As your course expiration date approaches, we do forward a notice advising the employer of the available options (extension, transfer, etc.)

## What is a Good Study Pace?

For this course, a good pace would be a goal of submitting at least one test each week. That way, you keep sharp and don't forget material from the last lesson. There are a few students who will sit down with this course and knock it out over a long weekend. It's really a matter of your commitment to time management.

## To Mail or to Fax?

When you've finished a test, you can either put it in the postpaid envelope and mail it or slip it into the fax machine for quicker service. (Keep the originals if you fax.) We try to grade all tests the same day they are received. Faxes coming in after the instructor's work day will be graded the next working day.

# LESSON 1

## Lesson Objectives

This is the place to start your foundation of knowledge about how to spec light duty trucks, and it really doesn't matter if you've ever worked with trucks before!

The objectives of this lesson are quite basic. You need to appreciate the huge size of the light truck market, know the different types of trucks, and understand the Ford offerings in this market place. By the time you have completed this lesson and worked through the open book test, you should have achieved these objectives:

- Understand the size of the light truck market
- Appreciate the value people see in trucks
- Identify the basic categories of truck models
- Match Ford truck models with the categories
- Understand Ford models, options and package codes
- Explain why ton ratings have little significance
- Tell the difference between two-wheel, four-wheel, and all-wheel drive
- Identify the basic parts of your Source Books

Before reading any further, round up your Truck and SUV Source Books, to be ready when we make and references. You'll find them especially helpful once we get into explaining the different vehicle types.

## The Light Truck Market

In Ford dealerships where cars and trucks are sold side-by-side, trucks often account for about 50% of sales. And of course, in some parts of the country, trucks outsell cars by a wide margin. What it all means is that light truck sales are a big business!

According to *Automotive News*, the 2003 calendar year shows there were over 8.8 million light trucks sold in the U.S alone. Here

In summary, here are the quick facts on why there are so many light trucks sold in the U.S. and Canada:

- Relatively low purchase price
- Perceived truck toughness and durability
- Larger load or passenger carrying capacity
- Continued high resale value
- A consistent commercial buyers market
- A good price and value relationship.

Having touched on some of the market characteristics, let's take a more in-depth look at the wide range of light-duty trucks, and see what Ford offers in each of the size categories.

## Light Truck Categories

If you look at the ranks of completed, ready to sell and use vehicles, there are seven industry accepted categories. We also have partially completed vehicles, which we will cover shortly. Here's a breakdown of each category, except for the small sport utility.

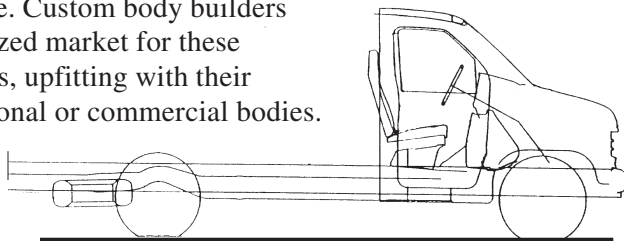
**Full size pickups** represent the largest market and consist of a regular type of cab (engine ahead of driver) with a cargo box length of 6.5 to 8.0 feet. Regular cabs seat up to three on a bench seat. Extended cabs, with a second bench seat can accommodate up to six adults. F-series are full size pickups, available in regular cab, SuperCab and SuperCrew cab versions. Available pickup boxes are the nominal 6.5 and 8.0 foot full width Styleside or exposed fender Flareside bodies. Or—a 5.5-foot Styleside box as standard on the F-150 SuperCrew. Yet another choice comes: two-wheel or four-wheel drive (4x2 or 4x4).

*F-150  
SuperCab*

1-1

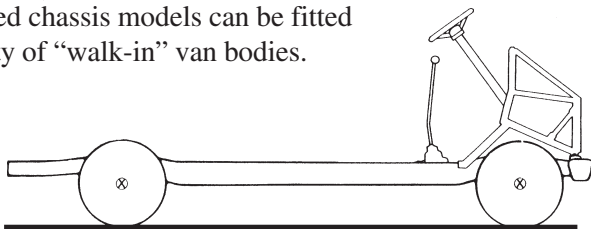


**Cutaway type vans** would be an accurate way of describing the Econoline RV cutaway or commercial cutaway. Take an Econoline Van, “chop” behind the cab, and you have an RV or commercial cutaway Econoline. Custom body builders are the specialized market for these cutaway models, upfitting with their unique recreational or commercial bodies.



*E-350  
Cutaway 1-10*

**Commercial stripped chassis** is the most specialized of Ford light-duty truck model line. Forward control is the industry term for this type of chassis: move the driver and passenger seats forward, beside the engine, and you have a forward control chassis. Ford’s E-350/450 commercial stripped chassis models can be fitted with a broad variety of “walk-in” van bodies.



*E-350 Super Duty  
Commercial  
Stripped Chassis  
1-11*

## Chassis Drive Types

If you’ve done any kind of reading at all about trucks (like in a couple of the truck descriptions above!), you will have come across terms like “two-wheel drive” and “four-wheel drive.” This is a basic reference to the number of wheels that are putting power down on the ground. Let’s assume the truck has four wheels so we can examine the various types of drive configurations on chassis.

**Two-wheel drive** assumes that power is transmitted to either the two rear or two front wheels. For trucks, rear wheel drive is the most common although some minivans go the front wheel route. In truck talk, we call this a “4x2” drive arrangement meaning four wheels, two of which are driven.

# LESSON 2

## Lesson Objectives

Much as Lesson 1 made you aware of the different types of Ford trucks, this lesson will take you deeper into your Source Books in search of more detailed information.

Here is a list of the objectives we have set forth in Lesson 2. Once you have read this lesson and have completed Test 2, you should have a clear understanding of:

- Source Book format, and contents
- What the terms GVW and GVWR mean
- What is meant by the term GAWR
- Where to find curb weights in the Source Books
- How equipped curb weight is determined
- How to calculate payload capacity
- Where to find standard and optional specifications
- Determining interior/exterior trim content
- Common vehicle dimensions and abbreviations.
- Electrical systems basics

## The Source Books: Phase II

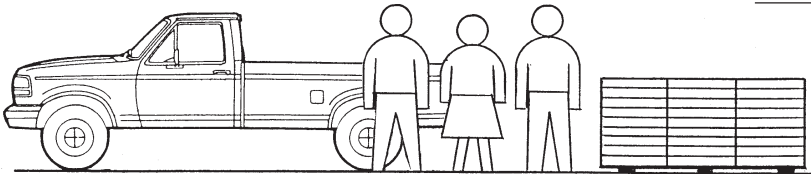
Through your studies in Lesson 1, you gained a basic familiarity with the Truck Source Book. In particular, the Ranger pickup section was chosen to demonstrate what and how the product data is presented. In Lesson 2, we'll get into more detail. Also, your studies will concentrate on the F-Series sections. In contrast with the limited scope of Ranger models, Ford's F-Series encompasses scores of truck models. As a reminder, your light-duty focus will take in the F-150 through the Super Duty F-550 series.

That comes to 550 lbs over the GVWR, so what does that indicate? It means that you cannot load this vehicle to the maximum front and rear GAWRs without exceeding the maximum GVWR. It is a built-in safety measure on most light trucks where the maximum GVWR accounts not only for component capacities, but also vehicle handling, braking and performance characteristics.

## Curb Weight Information

The weight of a vehicle without payload or cargo is the *curb weight*. Another way to look at curb weight is that it is the unloaded weight of a vehicle. Your Source Book contains the curb weight for each model, which is an estimated weight for the vehicle with standard specifications, a full tank of fuel, but no occupants, optional equipment, add-on bodies, etc.

2-2



Curb Weight **plus** Occupants **plus** Cargo **equals** GVW.

## Calculating Equipped Curb Weights

Heavy-duty trucks use a term “tare weight” to mean the weight of a truck when it runs over the scales without any payload. In a similar fashion, the equipped curb weight of your light trucks consists of the base curb weight plus “add-on” weights of options and special equipment (like a utility body on a cab-chassis).

To be able to explain to a customer how much payload can be carried by the truck, you need to know the equipped curb weight as well as the GVWR.

Here’s a sample problem that starts with option weights, then adds the curb weight, resulting in an equipped curb weight. Like the previous example of GAWRs and GVWRs, these weights were taken from your Source Book when this lesson was prepared.

# LESSON 3

## Lesson Objectives

Lesson 2 provided insights into vehicle and axle weight ratings, as well as an understanding of payload and cargo capacities. Lesson 3 takes a different approach as we look at the truck from a mechanical standpoint of the springs, axles, tires, wheels and brakes. We also get into distributing payloads and option weights using percentages. Completion of this lesson and the test will enable you to:

- Distribute weights using percentages
- Use load CGAs to calculate distribution percentages
- Know your chassis-cab models and their potentials
- Compare the terms yield strength and section modulus
- Look up section modulus values for different models
- Define Resisting Bending Movement—RBM
- Understand the different types of front axle systems
- Explain the difference between semi-floating and full-floating axles
- Interpret tire sizes and load ratings
- Explain the basics of spring ratings, shock absorbers and stabilizers
- Be familiar with brake systems—disc, drum, anti-lock
- Calculate GAWRs based upon given component ratings

## Introduction to Truck Weight Distribution

It would be just as well if you have had no prior experience with the aspect of truck technology that we call weight distribution. All too often, this very elementary subject is approached with a mixture of witch doctor mumbo-jumbo and mind-bending arithmetic. At this point, clear your memory and start fresh!

Just what is truck weight distribution? The clearest verbal definition would be the sharing of weight by the front and rear axles of

# LESSON 4

## Lesson Objectives

As you move through this course, we trust that you are developing a clear understanding of trucks in general, and Ford Trucks in particular. In this lesson, we take a look at one more decision factor for truck buyers, and that relates to how much performance the truck should have.

Listening to what customers say about what they are looking for in a truck is a very important role for you, the truck professional. You need to be on the lookout for the performance oriented buyer. Who is that? It could be the horse trailer puller, it might be the fire or rescue squad, or it just may be that average person looking for an eight-passenger E-150 Wagon. The customer who talks about going up hills, starting on grades, getting out of mud or sand, or pulling large loads is talking about performance.

By working through this lesson and completing the test, you should be able to achieve the following objectives.

- Know the basic types of engines available in Ford Trucks
- Name four types of fuels for spark ignited engines
- Explain the functions of turbochargers and intercoolers
- Tell the difference between torque and horsepower
- Understand the available manual and automatic transmissions
- Explain how axle ratios affect performance and economy
- Calculate power demands for light-duty trucks
- Express performance in terms of gradeability

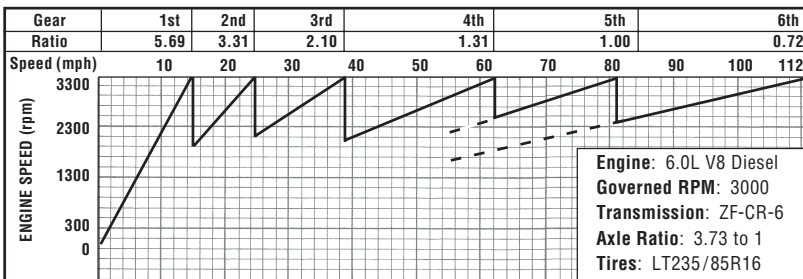
In dealing with truck performance ability in Lesson 4, you will see that horsepower cares not whether it comes from gasoline or diesel fuel, and the same applies to torque output. This implies a hint that you may experience a diesel performance example. But that said,

sis cabs. In the trailer tow example, running in fifth-direct at 55 mph, the 6.0L Turbo Diesel works at less than a 44% load factor (105 HP demand versus 238 HP at full-fuel). Perhaps frontal area considerations should warrant specific case consultations with a Ford technical advisor. (Source Book reference: Truck Towing section, Trailer Towing Applications — Super Duty F-250/350 series.)

## Harnessing the Horsepower

So far, we have studied truck performance in direct drive and overdrive gears, but what about the other transmission gears? No, this does not lead to more probing of gradeability. That ground has been plowed. More to the point are the gear ratios and how they influence truck performance. As a way to demonstrate, this next illustration exposes a tool used to evaluate heavy-duty truck power teams; it is commonly known as a “shift pattern chart.” On the right are the pertinent specs, taken from our F-350 and trailer combo. The vertical shift lines denote the top speeds in the various gears.

4-10



Each bottom point of the “saw tooth” indicates engine speed after the upshift. “Harnessing” is a good term here, because the 6.0L V8 engine can run in its best torque range—from 1600 to 2600 rpm.

If you want to know engine rpm at any road speed, read down to the diagonal and trace left to the RPMs. Example: fourth gear at 45 mph shows 2400 rpm.

Speaking of engine speeds, earlier we sneaked in a figure of 1613 rpm for sixth-overdrive at 55 mph. In the Appendix/Tables, notes for Table 1-B tell how to deal with gears other than direct drive. Example: recall the direct-drive rpm of 2240; multiply that by the 0.72

# LESSON 5

## Lesson Objectives

Four down and one lesson to go. You're in the home stretch: Most of the heavy topics are behind you, so this lesson will focus on the specialty aspects of light trucks. These days, anyone connected with trucks needs to have a clear understanding of 4x4s and 4-wheel drive systems, and that is ahead for your taking. Recreational truck uses is another specialty, so there is more to know about trailer towing. You have a broad range of trucks featuring the optional 6.0L V8 Turbo Diesel; knowing its features, advantages and diesel costs aspects will be to your benefit. And finally, to be an effective contender in the market for working trucks, know your chassis-cab potentials; we push the limits with a dump body, so help is ahead for you. Here is a summary of the lesson objectives:

- Know your 4x4 models and 4x4 drive systems
- Understand GVW, GTW and GCW for trucks and trailers
- For truck-trailer combinations, determine gross weights
- Be aware of trailer and hitch classes
- Know the hitch types, including fifth wheelers
- Trace the load factors for a chassis-cab-dump truck
- Understand the markets for diesel powered trucks
- Calculate diesel cost savings and the payback period
- Be aware of advances in safety and a cleaner environment.

## Sport Utilities: Another Look

In Lesson 1, we noted how sport utility type trucks are a significant portion of the truck market. Let's take another look at the Ford models that dominate this market.

# Appendix

## TABLES & DATA

<b>Appendix Page</b>	<b>108</b>	Weights and Measures/Metric Equivalents
	<b>109</b>	<b>Tires:</b> Load and Inflation Data
	<b>110-111</b>	<b>Table 1:</b> Tires-Axle Combinations & Engine Speeds
	<b>112</b>	<b>Table 2:</b> Rolling Resistance Net HP Required
	<b>112</b>	<b>Table 3:</b> Frontal Areas: Light Trucks & Bodies
	<b>113</b>	<b>Table 4:</b> Air Resistance Net HP Required
	<b>113</b>	<b>Table 5:</b> Grade Net HP Required
	<b>114</b>	<b>Table 6:</b> Road Surface and Effects on Performance
	<b>115-118</b>	<b>Glossary:</b> Light Truck Terms
<b>Index Page</b>	<b>119</b>	Index: Alphabetical References

# Index

## A

- Air Resistance**
  - table of net horsepower required 113
- Air resistance** 80, 84, 85, 113
- All weather tire tread** 61
- All wheel drive (AWD)** 28
- All-wheel drive (AWD)** 25, 91
- Alternative fuel vehicles (AFV)** 69
  - bi-fuel vehicles 69
  - dedicated vehicles 70
  - flexible fuel vehicles (FFVs) 69
- Anti-lock brakes (ABS)** 63, 64
- Anti-skid** 63
- Aspect ratio** 62
- Automatic transmissions** 77, 78, 79, 81
- Axle ratings** 57
- Axle ratios** 74, 75
- Axle systems** 56

## B

- Bias ply tires** 60
- Box frame** 53

## C

- Carburetion** 69, 70, 71
  - vs fuel injection 70
- Center of gravity (CG)** 44, 46, 47

- Channel frame** 53
- Chassis friction** 79
- Chassis-cab** 23, 38, 39, 48
- Coil springs** 58, 59
- Compact pickup** 18, 20, 28
- Compact sport utility** 21
- Component ratings** 63
- Compression ignition** 71. *See also Diesel engines*
- Crew-cab** 19
- Curb weight** 35
  - calculating equipped 35
- Cutaway van** 21, 24

## D

- Demand horsepower** 80, 84
- Diesel engines** 71, 102, 103
- Differential** 58, 91, 92
- Dimensions** 38
- Disc brakes** 63
- Driving front axle** 57
- Drum brakes** 63
- Dual wheels** 56
- Dynamometers** 72

**E**

- Electrical systems** 39–41
- Electronic engine control system**  
EEC-V 69
- Engine speed (RPM)** 85, 97  
and horsepower 82  
and shift patterns 86
- Engines**  
introduction to 68
- Equipment add-on weights** 65

**F**

- Fifth wheel trailer hitches** 96, 97
- Flywheel** 77
- Ford Truck Source Book** 3, 9, 25
- Forward control chassis** 24
- Four-wheel drive** 25, 61, 91
- Frame strength** 52, 53
- Frames** 55  
and special bodies 55
- Front axles and suspensions** 56
- Frontal area** 80, 85, 112
- Fuel economy** 60, 76, 84  
and fuel injection 70  
and overdrive transmissions 85  
intercooling 71
- Fuel injection** 104  
multi-port  
sequential 71  
SEFI Sequential Multi-port  
Electronic 69  
throttle body 71  
vs carburetion 70
- Full size pickup** 18, 19, 28
- Full size sport utilities** 22
- Full size vans** 21
- Full-floating axle** 57

**G**

- Gas engines** 70  
and turbocharging 71  
vs diesel 71
- Grade resistance** 81, 113  
Table of net horse power required  
113
- Gradeability** 80, 81, 84  
formula for 84
- Gradeability**  
table of performance loss due to  
road surfaces 114
- Gross axle weight rating (GAWR)**  
33, 34, 63
- Gross combination weight (GCW)**  
92, 94, 96, 97, 98, 99
- Gross trailer weight (GTW)** 92, 93,  
95, 98  
distribution of fifth wheel load 98
- Gross Vehicle Weight (GVW)** 33
- Gross vehicle weight rating (GVWR)**  
33, 34, 54, 62, 92

**H**

- Highway tread** 61
- Horsepower** 72, 73, 74, 75, 77, 79, 80,  
81, 84, 85, 112, 113  
air resistance demand 80, 113  
and engine speed 82  
effects of heat and altitude 87  
required for grade 113  
reserve 82, 84  
rolling resistance demand 80
- Hypoid gearing** 58

**I**

- Independent front suspension (I.F.S.)**  
56
- Intercooling** 71

## L

- Ladder frame** 53, 56
- Leaf spring** 58, 59
- Limited slip differential** 58
- Load capacity** 52, 57, 59, 61, 62, 93
- Load rating** 59, 61
- Locking hubs** 91
- Long wheelbase** 54

## M

- Manual transmission** 76, 77, 78, 79
- Minivan** 20, 21, 24, 28
- Monobeam front axle** 57

## N

- Naturally aspirated engines** 71
- Net horsepower** 74, 80, 81, 112, 113
- Net torque** 73

## O

- On/off road tires** 61
- Overhead camshaft**
  - double overhead 69
  - single (SOHC) 69
- Overhead Valves (OHV)** 69

## P

- Payload capacity** 32, 36
- Payload weight** 50
- Power take-off (PTOs)** 99, 117

## R

- Radial tires** 60, 109
- Rear axles** 57
- Resisting bending moment (RBM)** 54
- Rolling resistance** 80, 84, 112
  - radial vs. bias ply tires 80

## S

- Safety equipment** 39
- Section modulus** 53, 54, 55, 57
- Semi-floating rear axles** 57
- Shift pattern chart** 86
- Shock absorbers** 56, 59
- Short wheelbase** 54
- Sport utility** 28, 90
- Spring ratings** 58
- Stabilizer bars** 59
- Stripped chassis** 24

## T

- Tare weight** 35, 51
- Tire-axle ratio combinations**
  - table of engine speeds 110, 111
- Tires** 71
  - bias ply 60
  - capacity at max inflation 109
  - radial ply 60
  - size designations 62
  - sizes and dimensions 62
- Tongue weight, trailer** 93
- Torque** 72, 76
  - and engine speed 86
- Torque converter** 77, 78, 79
- Torque curve** 73
- Torsion bar suspensions** 58, 59
- Towing capacity** 97
- Traction control** 63

**Trailer hitches**

- bumper mounted (dead weight) 93
- classes of 96
- fifth wheel 97
- weight distributing 95

**Trailer** 92

**Tread design** 60

**Tread width** 39

**Turbochargers** 71

- and diesel engines 71
- and intercoolers 71
- less loss to altitude and heat 87

**Twin I-Beam I.F.S.** 57

**Two-stage rear springs** 59

**Two-wheel drive** 24, 61

**W**

**Weight distributing hitch** 95

**Weight distribution** 43, 44, 46, 47,  
51, 52, 99

**Weight ratings** 32

**Wheel slip** 92

**Wheel spin** 58

**Y**

**Yield strength** 54