



MOTORCRAFT® UNIVERSITY

2024

COURSE

CATALOG

WWW.MOTORCRAFTUNIVERSITY.COM
HEADQUARTERS@MOTORCRAFTU.COM

800.517.0173

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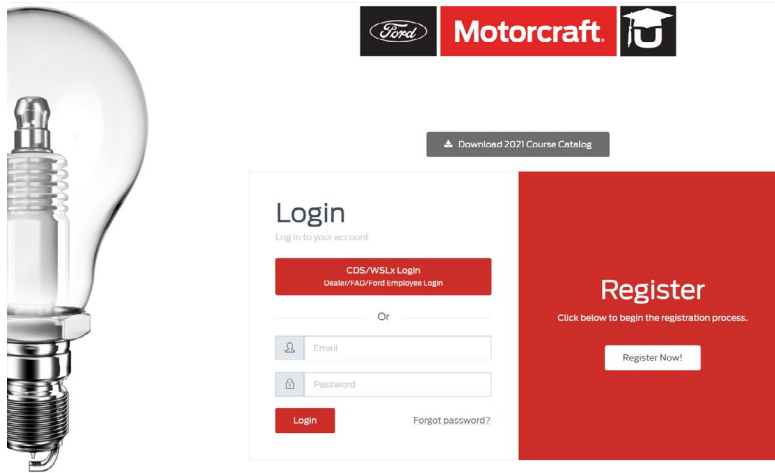
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MOTORCRAFT UNIVERSITY PORTAL FEATURES

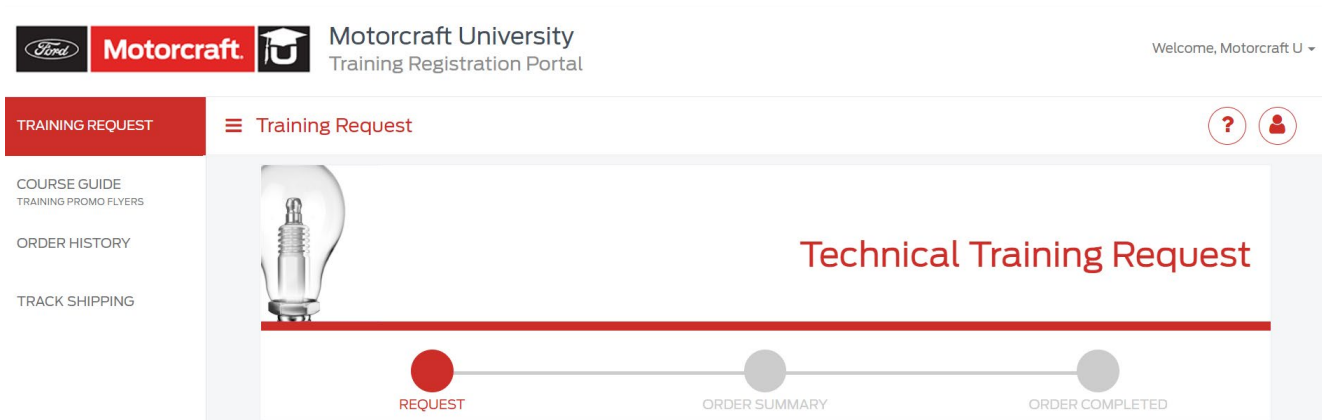
Login Page

When you first visit MotorcraftUniversity.com, you will be instructed to log in or register for an account. To log in using a CDS ID, click the red Dealer/FAD/Ford Employee Login button. To log in using an already registered account, fill in your email address and password.



Requester Homepage

Once you have registered/logged in, you will be taken to the Training Request Form. Additional navigation is available on the left-hand menu.



Motorcraft University Portal Features

Training Registration Form – Complete the Form for One or Multiple Sessions

Fill in the Contact Information section. Required information to submit your form includes: Primary Contact, Ford Contact and Billing P&A Code. Secondary contacts can be added as needed.

Training Session

STEP 1 | Contact Information

P&A Code - Required

Primary P&A ...

Add a different P&A Code for billing? NO

Primary Contact - Required

First Name	Last Name	Phone	Email
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Add a Secondary Contact? NO

Ford Contact ⓘ - Required

First Name	Last Name	Phone	Email
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Select Training

Select your course scheduling options.

STEP 2 | Select Training

Select course scheduling options.

Each request allows you to book one live training session.

The training course participant maximum is 40 attendees per course. An additional charge of \$100 per person will be billed to your P&A account for each attendee over the 40-participant limit, based on actual attendance.

Motorcraft University schedules training on a first-come, first-served basis, which also considers instructor availability. Please be sure to choose at least one alternate date when requesting training.

<p>Choose a Date ⓘ - Required</p> <p><input type="text"/></p>	<p>Choose a Course ⓘ</p> <p><input type="text"/></p>
<p>Choose a Time ⓘ - Required</p> <p><input type="text"/></p>	<p>Choose Participants</p> <p>Max 40 ⓘ</p> <p><input type="text"/></p>
<p>Choose an Alternate Date ⓘ - Required</p> <p><input type="text"/></p>	
<p>Choose an Alternative Time ⓘ - Required</p> <p><input type="text"/></p>	

Training Location & Shipping Location

Enter your Training and Shipping location information. Required information to submit your form includes: Training/Shipping City and State.

Notes or special requests can also be added to a training request at the bottom of the form by switching the toggle from No to Yes.

STEP 3
Training Location & Shipping Location

The City and State of your Training Location are required for registration. If you do not have the full address, you may fill in the remainder of the address at a later date. Also, after entering the information, if your Training Location City and State change at a later date, you will need to update the information by calling 800-517-0173 or emailing headquarters@motorcraft.com.
NOTE: SECURE LOCATION AT LEAST 30 DAYS PRIOR TO EVENT OR CANCELLATION FEE MAY APPLY.

Training Location

Location Name / Street Address

Address 2

City * - Required

State * - Required ZIP Code
Choose...

Shipping Location

Shipping location is the same as the training location. NO

Location Name / Street Address

Address 2

City

State ZIP Code
Choose...

Add Notes or Special Requests? NO

Add Another Order
I'm Done! Take Me to Order Summary >

Then add another session to your request by selecting “Add Another Order,” or submit your completed request and go to your Order Summary.

Order Summary

Review and accept the terms and confirm that all Order Summary information is correct.

On-Site Technical Training Request

●
REQUEST

●
ORDER SUMMARY

●
ORDER COMPLETED

Thank you for your request. Please review and accept the terms below and confirm that all Order Summary information is correct.

Billing

Additional materials for attendees over 40 (for each course) will incur additional charges. Each course includes trainer travel, attendee materials, and attendee completion certificates.

- Training cost is \$1,600 for one seminar, and only \$1,100 for each additional, subsequent session of any course code. For subsequent sessions to qualify for the reduced rate, they must (a) have the same billing P&A Code, (b) occur consecutively over week days/nights and (c) must be within 120 miles of the previous location.
- If the distance between training locations is over the 120 mile limit, an additional \$250 fee will be applied.
- \$250 per day surcharge for training in Hawaii and Alaska
- Maximum 40 attendees/material sets. An additional charge of \$100 per person will be billed to your P&A account for each attendee over the 40-participant limit, based on actual attendance.

Dealer/FAD will be billed after the session, or sessions, have taken place. Each course includes trainer travel, attendee materials and attendee completion certificates. Prices subject to change. Billing occurs on the Dealer's/FAD's Parts Statement. It is the Dealer's/FAD's responsibility to ensure sufficient Business Growth Funds or Aftermarket Promo Funds are available to cover all Motorcraft University expenses. If sufficient funds are not available, a debit will be made to the Dealer/FAD Parts Statement.

Registered Professional Service Network Program Sellers may choose to apply their 2018 Professional Service Network credit good for one (1) training event free of charge. (Does not include additional materials over 40 attendees or surcharges for mileage or AK/HI events.)

I Accept

Order Summary

Print

Training Request

Contact				
P&A Code	Billing P&A Code	Name	Phone Number	Email
52692	52692	Motorcraft University	1-800-517-0173	headquarters@motorcraft.com
Ford Contact				
Name	Phone Number	Email		
Ford Contact	1-800-123-4567	fordcontact@ford.com		
Training				
Course Name	Status			
Automotive Electronics Operation and Diagnosis	Pending			
First Date Choice	First Time Choice	Participants	Use Ford PSN Seller Session Account	
01/01/2022	2:00 PM (America/Detroit GMT-5:00)	36-40	No	
Alternative Date Choice	Alternative Time Choice	Additional Comments		
-	-	-		
Training Location			Shipping Location	
Dearborn, Michigan 48126			-	

You will receive a billing estimate once training details have been confirmed.

< Edit My Request
Submit My Request

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Motorcraft University Portal Features

View Order History

Review status of requested training and training details from the Order History tab.

Status	Training Date	Ref #	Course Name	Training Location	MA	Comm.	Req. Form
Pending	Pending	13318	Automotive Electronics Oper...	Here, MI	Unlisted		
Scheduled	07/28/2018	13317	Automotive Electronics Oper...	Pending	Unlisted		
Scheduled	09/24/2018	13316	Gasoline Engine Diagnosis a...	Here, AR	East		
Completed	07/28/2018	13298	Body and Chassis Electrical...	Southfield, MI	East		
Billed	07/20/2018	13296	Advanced Brakes and Interac...	Dearborn, MI	Unlisted		
Billed	07/19/2018	13295	Body and Chassis Electrical...	Pending	Unlisted		

Review Course Guide

On the Course Guide tab you can view a full list of available courses along with downloadable, customizable flyers to help promote your training.

Motorcraft University Training Registration Portal

Welcome, Motorcraft U

TRAINING REQUEST

Course Guide

COURSE GUIDE

ORDER HISTORY

TRACK SHIPPING

REPORTING

TRAINING DOCKET

MANAGE TRAINERS

PRINT MANAGER

BILLING ESTIMATE

Course Guide

Click an arrow (>) to reveal/hide information about each Motorcraft University course and access a customizable PDF flyer that can be emailed to attendees.

- "Course Overview Map" reveals a single-sheet summary of available training.
- "Download Course Guide" will open the full Motorcraft University Course Guide for download or printing.

Download Course Guide

> Course Overview Map

Electrical/Electronics

> Automotive Electronics Operation and Diagnosis

Powertrain

Diesel

Maintenance and Light Repair

Track Materials Shipments

Easily track shipping of training materials and participant certificates from the Track Shipping tab.

Track Shipping						
Click Order Details or a Tracking Number for more information or to check shipment status.						
Ref #	Date	Shipment Type	Training Location	MA	Trainer	Tracking
13223	Pending	Materials		Great Lakes	Dr. Garland Considine I	685518157535108
13222	Pending	Materials		Great Lakes	Miss Sigrid Franecki MD	437468991610586
13221	Pending	Materials		Great Lakes	Dr. Dario Senger Sr.	672195742874284
13220	Pending	Materials		Great Lakes	Miss Alyson Robel Jr.	193385079770699
13219	Pending	Materials		Great Lakes	Ms. Mackenzie Batz I	918153403731216
13218	Pending	Materials		Great Lakes	Miss Marcus Wilkinson III	774461039487704
13217	Pending	Materials		Great Lakes	Ms. Maria Schuster I	668487960854985
13216	Pending	Materials		Great Lakes	Ms. Carolanne Carter V	845172243223432
13215	Pending	Materials		Great Lakes	Miss Gabrielle Leffer IV	606135314603126
13214	Pending	Materials		Great Lakes	Mrs. Rahul Ziemann V	394689360109756
13213	Pending	Materials		Great Lakes	Mr. Ewell Collins DVM	695607597570323
13212	Pending	Materials		Great Lakes	Mrs. Briana Hoppe DVM	776037092156788
13211	Pending	Materials		Central	Mrs. Cathrine Kiehn IV	125619991140777

MOTORCRAFT UNIVERSITY IS DEDICATED TO PROVIDING TECHNICIANS WITH OEM-LEVEL TECHNICAL KNOWLEDGE THAT IS ESSENTIAL TO SUCCESSFULLY SERVICING AND REPAIRING MODERN FORD VEHICLES.

FIX IT RIGHT THE FIRST TIME

Motorcraft University offers courses on critical Ford and Lincoln systems that can benefit repair facilities of all sizes.

With the insight that only Ford can provide, Technicians at Installers can get insider tips and tricks that complement Ford OE and Motorcraft part installation to deliver a quality repair for their customers.

Our three-hour in-person sessions let Aftermarket Technicians get up to speed and back to the shop the same day. And, class size is limited to focus on the needs of those attending, allowing for questions to be answered when they arise.

COURSE STRUCTURE

- Available to Ford and Lincoln dealerships and Ford Authorized Distributors (FADs) only
- Each course is designed to be three hours in length (Ford Diagnostic and Service (FDRS) and VCMM Operation has the option for an additional hour)
- Presented in a live training format with up to 40 attendees
- Courses are usually scheduled in evenings, after normal work hours, but can be scheduled at any time during the day to accommodate local needs
- Allows for one-on-one interaction between Dealer/Distributor and participants
- Course cost may be offset by parts purchase offers for attending the training. Dealers/Distributors may also fund certain events with:
 - Promotional Growth Funds/Business Growth Funds
- Courses are usually held at a local venue or the Dealer/Distributor facility
- It's customary for the hosting Dealer/Distributor to begin the seminar with a meal

COURSE STRUCTURE (continued)

MOTORCRAFT UNIVERSITY TECHNICAL TRAINING – ADVANTAGE: YOU

Motorcraft knows that many Aftermarket Technicians receive limited technical training, especially if they happen to work in a smaller facility. Through Motorcraft University, Motorcraft provides OEM-level training on vehicle systems and technologies, which Technicians may have seen and worked on, but without a full understanding.

Motorcraft University training gives Independent Repair Facilities the confidence to deliver high-quality Ford and Lincoln parts and service from every bay.

But Motorcraft University doesn't just benefit the Technician. By offering training, customer relationships with the dealership or Distributor can be created when trying to win over new customers, or enhanced with existing customers. And, in addition to Motorcraft University training being an instant headliner for an open house or other event, the goodwill created can lead to higher recall when customers are shopping for parts, and eventually, greater parts sales.

MOTORCRAFT UNIVERSITY COURSE MAP

Motorcraft University

COURSE OVERVIEW MAP



Electrical/Electronics

Advanced Driver Assistance Systems (ADAS) - NEW

Learning Objective: This course provides students with the foundation required to understand the latest ADAS technologies being used on today's Ford vehicles.

●●● **Technical Content:** Intermediate

Recommended Prior Knowledge:
Working knowledge of vehicle electronics including networks

Automotive Electronics Operation and Diagnosis - REVISED

Learning Objective: Provide Technicians with essential current information on automotive electrical/electronics components and systems.

●●● **Technical Content:** Basic

Body and Chassis Electrical/Electronics Diagnosis and Service - REVISED

Learning Objective: Enhance Technician ability to effectively diagnose and service vehicle electrical/electronics systems.

●●● **Technical Content:** Intermediate

Recommended Prior Knowledge:
Working knowledge of vehicle electrical/systems.

Ford Diagnostic and Repair System (FDRS) and VCMM Operation

Learning Objective: Provide Technicians with the knowledge needed for the FDRS program and VCMM Tool.

●●● **Technical Content:** Basic to Intermediate

Ford E-Transit Operation, Diagnosis and Service - NEW

Learning Objective: This course provides technicians with the fundamentals needed to understand high-voltage operation, and the knowledge required to service the Ford E-Transit safely and accurately.

●●● **Technical Content:** Advanced

Recommended Prior Knowledge:
Electrical and electronic system operation.

Ford Explorer and Lincoln Aviator Hybrid Vehicle Components and Operation

Learning Objective: Expand Technician knowledge needed to service the latest hybrid systems from Ford.

●●● **Technical Content:** Basic to Intermediate

Ford High-Voltage Vehicles Components and Operation - REVISED

Learning Objective: Provide Technicians with knowledge on Ford high-voltage vehicle technology components and operation so that

they can complete repairs on Ford hybrid and electric vehicles.

●●● **Technical Content:** Intermediate

Integrated Diagnostic Software (IDS) Operation and Utilization

Learning Objective: Provide Technicians with key knowledge for the use of the Ford Rotunda Integrated Diagnostic Software (IDS) Scan Tool for optimal utilization.

●●● **Technical Content:** Basic to Intermediate

Networks and Control Module Operation, Diagnosis and Service - REVISED

Learning Objective: Deliver current information to Technicians on electronic networking systems, including components, strategies, symptoms, diagnosis and testing so that they can properly repair Ford network and control module issues.

●●● **Technical Content:** Intermediate

Recommended Prior Knowledge:
Working knowledge of vehicle electrical/electronics systems.

Body and Chassis

Electronic Steering and Suspension Operation, Diagnosis and Service

Learning Objective: Describe the function and operation of electronically controlled steering and suspension systems for optimal diagnosis and service.

●●● **Technical Content:** Intermediate

Passive Restraints and Anti-Theft Systems

Learning Objective: Enable Technicians to safely and confidently work with and near passive restraints and anti-theft systems.

●●● **Technical Content:** Basic to Intermediate

Advanced Brakes and Interactive Vehicle Dynamics (IVD)

Learning Objective: Understand the operation and function of advanced vehicle brake systems, including key diagnostic approaches to Interactive Vehicle Dynamics (IVD), so that Technicians can effectively service Ford Motor Company vehicles.

●●● **Technical Content:** Intermediate

Advanced Air Conditioning Diagnosis and Service

Learning Objective: Conduct a comprehensive analysis of modern climate control systems that will allow Technicians to properly service them.

●●● **Technical Content:** Intermediate

Powertrain

Gasoline Engine Diagnosis and Repair - REVISED

Learning Objective: Provide Technicians with core diagnosis and repair information related to Ford naturally aspirated gasoline engines.

●●● **Technical Content:** Basic

Automatic Transmission Operation, Diagnosis and In-Vehicle Service

Learning Objective: Provide Technicians with automatic transmission basic operation and diagnostics that may be needed when servicing the Ford vehicles.

●●● **Technical Content:** Intermediate

Four-Wheel Drive (4x4) and All-Wheel Drive (AWD) Operation, Diagnosis and Service

Learning Objective: Provide Technicians with the knowledge needed to service the Four-Wheel-Drive (4x4) and All-Wheel-Drive (AWD) Systems on Ford vehicles.

●●● **Technical Content:** Basic to Intermediate



 **Engine Performance and Driveability**

Ford EcoBoost® Engine Operation, Diagnosis and Service

Learning Objective: Technicians will be able to understand how Ford EcoBoost engine technologies and systems operate so that Technicians can service these popular Ford engines.

●●● **Technical Content:** Basic

Emission Control Relationships for Driveability Diagnosis

Learning Objective: Technicians will be able to identify symptoms that can occur in modern engine on-board tests based on system and operating configuration.

●●● **Technical Content:** Intermediate

Gasoline Engine Performance and Driveability

Learning Objective: Technicians will be able to describe driveability symptoms, diagnostic techniques and corrective actions for vehicle performance and driveability concerns.

●●● **Technical Content:** Intermediate to Advanced

Recommended Prior Knowledge: Working knowledge of engine operation, OBD II Systems and scan tool utilization.

 **Maintenance and Light Repair**

Maintenance and Light Repair (MLR) Procedures, Inspections and Service

Learning Objective: Provide Technicians with key knowledge in identifying the Maintenance and Light Repair (MLR) tasks and guidelines for several common vehicle systems.

●●● **Technical Content:** Basic

Noise, Vibration and Harshness Diagnosis and Service

Learning Objective: Provide Technicians with the knowledge needed to service NVH issues on Ford vehicles.

●●● **Technical Content:** Basic to Intermediate

 **Diesel**

Diesel Maintenance and Service

Learning Objective: At the conclusion of this course, the student will be able to describe the periodic maintenance requirements of a diesel engine.

●●● **Technical Content:** Basic

Understanding Diesel Fuel Systems

Learning Objective: At the conclusion of this course, the student will be able to describe the fundamental principles of diesel fuel system components and operation.

●●● **Technical Content:** Basic

Diesel Engine Theory and Operation

Learning Objective: At the conclusion of this course, the student will be able to understand the fundamentals related to diesel engine operation, electronic engine management and engine subsystems.

●●● **Technical Content:** Basic to Intermediate

3.0L Power Stroke® Diesel Components and Operation

Learning Objective: Provide Technicians with the knowledge needed to service the Ford 3.0L diesel engine.

●●● **Technical Content:** Basic to Intermediate

3.2L Diesel Components, Operation and Service

Learning Objective: Provide Technicians with the knowledge that they need to service the Ford 3.2L diesel engine.

●●● **Technical Content:** Basic to Intermediate

Air Management Systems

Learning Objective: At the conclusion of this course, the student will be able to describe the fundamental principles of diesel air management and delivery components and operation.

●●● **Technical Content:** Intermediate

Diesel Aftertreatment System

Learning Objective: At the conclusion of this course, the student will be able to describe the fundamental principles of diesel air management and delivery components and operation.

●●● **Technical Content:** Intermediate

Diesel Electronic Engine Control (EEC) System

Learning Objective: At the conclusion of this course, the student will be able to describe the Electronic Engine Control (EEC) system's components and operation.

●●● **Technical Content:** Intermediate

6.0L and 6.4L Diesel Components and Operation

Learning Objective: Provide Technicians with key knowledge and insights on the location and operation of important aspects of two Ford diesel engines so that they can complete any necessary repairs on these engines.

●●● **Technical Content:** Basic to Intermediate

Recommended Prior Knowledge: Take this course PRIOR to attending 6.0L Diesel Advanced Diagnosis and Testing or 6.4L Diesel Advanced Diagnosis and Testing courses.

6.7L Power Stroke® Diesel Components and Operation

Learning Objective: Be able to demonstrate the knowledge that Technicians need to service the Ford 6.7L diesel engine.

●●● **Technical Content:** Intermediate

6.7L Turbocharger Operation, Diagnosis and Service

Learning Objective: At the conclusion of this course, the student will be able to describe the 6.7L Power Stroke® Single Sequential Turbocharger (SST) and DualBoost Turbocharger components, operation, diagnosis and service.

●●● **Technical Content:** Intermediate



Diesel Engines (cont'd)

3.0L Power Stroke® Common-Rail Fuel System

Learning Objective: At the conclusion of this course, the student will be able to describe the 3.0L Power Stroke® common-rail fuel system components, operation, diagnosis and service.

●●● **Technical Content:** Intermediate to Advanced

3.2L Fuel, Air and Exhaust Systems

Learning Objective: At the conclusion of this course, the student will be able to describe the 3.2L Power Stroke® high-pressure fuel system, air management system, and EGR and exhaust system components, operation, diagnosis and service.

●●● **Technical Content:** Intermediate to Advanced

6.4L Fuel, Air and Exhaust Systems

Learning Objective: At the conclusion of this course, the student will be able to describe the 6.4L Power Stroke® high-pressure fuel system, air management system, and EGR and exhaust system components, operation, diagnosis and service.

●●● **Technical Content:** Intermediate to Advanced

6.7L Power Stroke® Common-Rail Fuel System

Learning Objective: At the conclusion of this course, the student will be able to describe the 6.7L Power Stroke® common-rail fuel system components, operation, diagnosis and service.

●●● **Technical Content:** Intermediate to Advanced

6.0L Diesel Hydraulic Electronic Unit Injector (HEUI) Fuel System

Learning Objective: At the conclusion of this course, the student will be able to describe the 6.0L Power Stroke® Hydraulic Electronic Unit Injector (HEUI) fuel system components, operation, diagnosis and service.

●●● **Technical Content:** Advanced

6.0L Power Stroke® Diesel Advanced Diagnosis and Testing

Learning Objective: Technicians who successfully complete this course will better understand proper diagnosis and testing for the Ford 6.0L diesel engine so that they can complete any necessary repairs on this engine.

●●● **Technical Content:** Advanced
Recommended Prior Knowledge: 6.0L and 6.4L Diesel Components and Operation course.

6.4L Power Stroke® Diesel Advanced Diagnosis and Testing

Learning Objective: Be able to understand advanced, in-depth diagnostic methods for the Ford 6.4L diesel engine.

●●● **Technical Content:** Advanced
Recommended Prior Knowledge: 6.0L and 6.4L Diesel Components and Operation course.

6.7L EGR and Exhaust System Operation and Service

Learning Objective: At the conclusion of this course, the student will be able to describe the 6.7L Power Stroke® EGR and exhaust system components, operation, diagnosis and service.

●●● **Technical Content:** Advanced

6.7L Power Stroke® Diesel Advanced Diagnosis and Service

Learning Objective: Provide Technicians with key knowledge on the diagnostic processes that will enable them to more quickly and effectively diagnose and repair the 6.7L Power Stroke Diesel engine.

●●● **Technical Content:** Advanced

7.3L and 6.0L Diesel Engine Repair

Learning Objective: At the conclusion of this course, the student will be able to describe the 7.3L and 6.0L diesel engines service and repair procedures.

●●● **Technical Content:** Advanced

For full course details, see the [Motorcraft University Course Catalog](#).



COURSE GUIDE

BODY AND CHASSIS

Electronic Steering and Suspension Operation, Diagnosis and Service

Modern vehicles have steering and suspension systems that are electronically controlled by computers. These systems adjust to vehicle loading, road and driving conditions. To help Technicians stay competitive, this training will describe the components, operation, diagnosis and service of these systems.

Topics Include:

- Electronic Power-Assisted Steering (EPAS)
- Variable-Assist Power Steering
- Rear Load-Leveling Suspension
- Four-Wheel Electronic Suspension
- Automatic Ride Control (ARC) Suspension
- Interactive Vehicle Dynamics (IVD) Suspension

Technical Content: Intermediate

Learning Objective: Describe the function and operation of electronically controlled steering and suspension systems for optimal diagnosis and service.

Passive Restraints and Anti-Theft Systems

Two of the most common systems found on vehicles today are passive restraints and anti-theft. Every Technician, regardless of specialty, must be able to work with and around these systems.

Topics Include:

- Supplemental Restraint System (SRS) Components and Operation (Single-Stage and Dual-Stage)
- SRS Diagnosis
- SRS Service
- Remote Keyless Entry (RKE) Components and Operation
- Perimeter Anti-Theft System Operation
- Passive Anti-Theft System (PATS) Components and Operation
- PATS Service

Technical Content: Basic to Intermediate

Learning Objective: Enable Technicians to safely and confidently work with and near passive restraints and anti-theft systems.

BODY AND CHASSIS (continued)

Advanced Brakes and Interactive Vehicle Dynamics (IVD)

Working on today's brake systems can be challenging. No longer is it just installing new pads and turning the rotors. Modern systems use more electrohydraulic controls than ever to control braking, vehicle traction and stability control. Technicians must understand how these systems work and what to look for when they do not work.

Topics Include:

- Anti-Lock Brake System (ABS) Operation
- Traction Control System Operation
- Interactive Vehicle Dynamics (IVD) Operation
- ABS/IVD Input and Output Components
- ABS/IVD Diagnosis
- Hybrid Vehicle Regenerative Braking
- Hydraulic Full-Power Brake Systems (Medium Trucks)
- Hydro-Max™ and Hydro-Boost™ Brake Systems (Medium Trucks)

Technical Content: Intermediate

Learning Objective: Understand the operation and function of advanced vehicle brake systems, including key diagnostic approaches to Interactive Vehicle Dynamics (IVD), so that Technicians can effectively service Ford Motor Company vehicles.

Advanced Air Conditioning Diagnosis and Service

You know how to recharge an air conditioning system, but do you know what makes it tick? Modern climate control systems are much more than a compressor and tubes; they are complete computer-controlled systems. Technicians must understand the different operating strategies and components of these systems to effectively diagnose and service them.

Topics Include:

- EPA Regulatory Requirements for MVAC Service
- Refrigerant System Testing – R-134a and R-1234yf
- AC Testing Setup Procedure
- Register Discharge Air Temperature Test
- Leak Testing
- Refrigerant Pressure Concerns
- General Service Procedures
- Refrigerant Analyzer
- Refrigerant System Service

Technical Content: Intermediate

Learning Objective: Conduct a comprehensive analysis of modern climate control systems that will allow Technicians to properly diagnose and service them.

DIESEL ENGINES

Diesel Maintenance and Service

All diesel engines require periodic maintenance to operate optimally. Diesel engines create extreme high pressure for combustion to occur. Lack of maintenance can prematurely age and damage engine components. This course describes maintenance and service procedures to keep Ford diesel-equipped vehicles in top-running condition.

Topics Include:

- Maintenance Overview
- Engine Overviews
- Recommended Maintenance Intervals
- Inspection Process
- Air Management System Maintenance and Service
- Under-Vehicle Inspections
- Lubrication Maintenance and Service
- Fuel Quality
- Fuel System Service
- Cooling System Maintenance and Service
- DPF Maintenance and Service
- SCR Reductant Maintenance and Service

Technical Content: Basic

Learning Objective: At the conclusion of this course, the student will be able to describe the periodic maintenance requirements of a diesel engine.

Understanding Diesel Fuel Systems

The function of the diesel fuel system is to inject a precise amount of atomized and pressurized fuel into each engine cylinder at the proper time. This course provides a basic understanding of the components, operation and strategies used to ensure the correct amount of fuel is delivered to the engine. A brief overview of fuel system component failures and symptoms is included. This course is not engine-specific, instead it provides a broad range of information on various Ford systems.

Topics Include:

- Diesel and Gasoline Comparison
- Diesel Fuel System Overview
- Low-Pressure Fuel System Components and Operation
- Fuel Quality
- Engine Control Components
- High-Pressure Fuel System Components and Operation
- High-Pressure Fuel System Warnings
- Fuel System Failures and Symptoms

Technical Content: Basic

Learning Objective: At the conclusion of this course, the student will be able to describe the fundamental principles of diesel fuel system components and operation.

DIESEL ENGINES (continued)

Diesel Engine Theory and Operation

Provides a basic overview of diesel engine operation, including high- and low-pressure fuel systems, electronic engine control management system, air intake system, and exhaust and emissions system.

Topics Include:

- Engine Operation
- Diesel Four-Stroke Process
- Powertrain Control Systems
- Fuel System
- Intake System
- Emission System
- Inputs
- Outputs
- Modules

Technical Content: Basic to Intermediate

Learning Objective: At the conclusion of this course, the student will be able to understand the fundamentals related to diesel engine operation, electronic engine management and engine subsystems.

3.0L Power Stroke® Diesel Components and Operation

This course will describe the 3.0L Power Stroke® Diesel components and operation. This includes turbocharger, low- and high-pressure fuel systems, Diesel Particulate Filter and selective catalytic reduction systems.

Topics Include:

- Engine
 - Overview
 - System
 - Maintenance
 - Component Location
 - Cooling System
- Fuel Charging and Controls
 - High-Pressure Fuel System
 - Turbocharging System
 - Glow Plug System
- Emissions Control System
 - Emissions Control System – Exhaust
 - Diesel Particulate Filter (DPF)
 - Selective Catalytic Reduction (SCR) System
- Networks and Control Modules
- Electronic Engine Controls

Technical Content: Basic to Intermediate

Learning Objective: Provide Technicians with the knowledge needed to service the Ford 3.0L diesel engine.

DIESEL ENGINES (continued)

3.2L Diesel Components, Operation and Service

The 3.2L Duratorq® I-5 diesel engine is an in-line 5-cylinder, common fuel rail, turbocharged diesel engine from Ford, a member of the global Puma engine family. This course helps Service Technicians better understand the engine's components and operation, in order to more effectively diagnose and service its systems.

Topics Include:

- Engine Overview
- Engine Components
- Cooling System
- Lubrication System
- Air Management System
- Fuel System
- Fuel Management System
- Electrical/Electronics
- Exhaust System

Technical Content: Basic to Intermediate

Learning Objective: Provide Technicians with the knowledge that they need to service the Ford 3.2L diesel engine.

Air Management Systems

Diesel engines require clean and efficient air delivery. This course provides a basic understanding of the components, operation and strategies used to ensure air is delivered to the engine. This includes turbocharger and EGR operation. Although the fundamentals are not diesel engine-specific, examples of the 6.7L and 3.2L air management systems are included.

Topics Include:

- Air Management Overview
- Air Inlet System
- Electronic Air Management Control
- Intake Air Management Operation
- Turbocharger
- Turbocharger Configurations
- Exhaust Gas Recirculation
- Air Management Fault Symptoms
- 6.7L Air Management System
- 3.2L Air Management System

Technical Content: Intermediate

Learning Objective: At the conclusion of this course, the student will be able to describe the fundamental principles of diesel air management and delivery components and operation.

DIESEL ENGINES (continued)

Diesel Aftertreatment System

The Diesel Aftertreatment System is a series of components that cleans the diesel exhaust emitted by the engine prior to releasing it through the tailpipe and into the atmosphere. Its purpose is to reduce the emission of harmful pollutants into the environment. This course provides the student with fundamental knowledge of system operation and diagnosis. This course is not engine-specific, instead it provides a broad range of information on various Ford systems.

Topics Include:

- Diesel Engine Exhaust Gases
- Aftertreatment System Overview
- Diesel Oxidation Catalyst (DOC)
- Diesel Particulate Filter (DPF) System
- Selective Catalyst Reduction (SCR) System
- Aftertreatment System Symptoms
- Cold Weather Aids Overview
- Glow Plug System
- Cold Weather Aid Symptoms
- Aftertreatment Diagnostic Process

Technical Content: Intermediate

Learning Objective: At the conclusion of this course, the student will be able to describe the fundamental principles of diesel air management, and delivery components and operation.



DIESEL ENGINES (continued)

Diesel Electronic Engine Control (EEC) System

The Electronic Engine Control (EEC) System provides optimum control of the engine through the PCM. This course provides the fundamental knowledge students need to understand electronic engine control operation. This includes the design and operation of modules, engine input sensors, switches, output devices and communication networks found on Ford diesels.

Topics Include:

- Network Overview
- Network Components
- Network Operation
- Modules
- Powertrain Control Module (PCM)
- Glow Plug Control Module (GPCM)
- Reductant Pump Control Module
- NOx Sensor Module
- Inputs
- Temperature Sensors
- Pressure Sensors
- Position Sensors
- Additional Sensors
- Outputs
- Solenoids
- Relays
- Additional Outputs

Technical Content: Intermediate

Learning Objective: At the conclusion of this course, the student will be able to describe the Electronic Engine Control (EEC) System's components and operation.

6.0L and 6.4L Diesel Components and Operation

This Motorcraft University training focuses on the Ford 6.0L and 6.4L diesel engines. Technicians will learn how these engines operate, as well as the location and operation of key components.

Topics Include:

- Fuel and Lubricants
- Air Management System
- Low-Pressure Fuel System
- 6.0L High-Pressure Oil and Fuel System
- 6.4L High-Pressure Fuel System
- Cooling Systems
- Maintenance

Technical Content: Intermediate

Learning Objective: Provide Technicians with key knowledge and insights on the location and operation of important aspects of two Ford diesel engines so that they can complete any necessary repairs on these engines.

Recommended Prior Knowledge: Take this course PRIOR to attending 6.0L Diesel Advanced Diagnosis and Testing or 6.4L Diesel Advanced Diagnosis and Testing courses.

DIESEL ENGINES (continued)

6.7L Power Stroke® Diesel Components and Operation

The Ford 6.7L diesel engine is found on a wide variety of Ford Heavy-Duty vehicles. This popular engine has evolved over the years and is now on its 3rd generation to meet the demands of the Medium Duty truck industry. This course focuses on expanding Technician knowledge and skills to effectively service these powerplants.

Topics Include:

- Engine Components and Specifications
- Fuel and Lubricants
- Air Inlet and Turbocharger
- EGR System Operation
- Diesel Particulate Filter (DPF) Operation
- Selective Catalytic Reduction (SCR) Operation
- Low-/High-Pressure Fuel Systems
- Engine Electronic Input and Output Operation, Diagnosis and Service
- Primary and Secondary Cooling Systems
- Vehicle Maintenance Procedures

Technical Content: Intermediate

Learning Objective: Be able to demonstrate the knowledge that Technicians need to service the Ford 6.7L diesel engine.

6.7L Turbocharger Operation, Diagnosis and Service

Turbocharged engines burn more fuel and air by providing large amounts of air into the engine cylinders, thus creating greater power. This course explains turbocharger operation, diagnosis and service. The course specifically describes the 6.7L Power Stroke® turbocharger systems, including both the Single Sequential Turbocharger (SST) and DualBoost Turbocharger.

Topics Include:

- Intake Air Management System
- Turbocharger Fundamentals
- 6.7L Turbocharger Configurations
- 6.7L Turbocharger System Components
- Exhaust Gas Recirculation
- Exhaust System
- Electronic Air Management Control
- Turbocharger System Operation
- Air Management Fault Symptoms
- Turbocharger System Diagnosis
- General Service Procedures

Technical Content: Intermediate

Learning Objective: At the conclusion of this course, the student will be able to describe the 6.7L Power Stroke® Single Sequential Turbocharger (SST) and DualBoost Turbocharger components, operation, diagnosis and service.

DIESEL ENGINES (continued)

3.0L Power Stroke® Common-Rail Fuel System

The common-rail diesel engine delivers more power to the vehicle while consuming less fuel and producing fewer emissions than previous systems. This course provides a detailed look at the 3.0L Power Stroke® fuel system. The course includes specific information on the 3.0L common-rail fuel system components, operation, electronic control strategies, and diagnosis and service.

Topics Include:

- Fuel Quality
- Low-Pressure Fuel System Components and Operation
- Optimizing Fuel System Performance
- Low-Pressure Fuel System Service
- High-Pressure Fuel System Components and Operation
- Piezo Fuel Injectors Operation and Service
- Fuel System Diagnosis and Service
- High-Pressure Fuel System Warnings

Technical Content: Intermediate to Advanced

Learning Objective: At the conclusion of this course, the student will be able to describe the 3.0L Power Stroke® common-rail fuel system components, operation, diagnosis and service.

3.2L Fuel, Air and Exhaust Systems

The diesel fuel, air and exhaust systems are the backbone of unique diesel engine operation. This course provides the students with a detailed look at the 3.2L Power Stroke® fuel, air and exhaust systems. Included is key information from each system regarding operation, diagnosis and service.

Topics Include:

- Diesel/Gas Engine Similarities and Differences
- 3.2L Fuel Supply System
- 3.2L High-Pressure Fuel System
- 3.2L Fuel Injectors
- Air Management System
- Turbocharger
- Exhaust Gas Recirculation (EGR)
- Electronic Air Management Control
- Air Management System Operation
- Diesel Engine Exhaust Gases
- 3.2L Exhaust System Components
- DPF Regeneration
- Exhaust System Diagnosis
- 3.2L Service Procedures
- Air Management Fault Symptoms
- Turbocharger System Diagnosis

Technical Content: Intermediate to Advanced

Learning Objective: At the conclusion of this course, the student will be able to describe the 3.2L Power Stroke® high-pressure fuel system, air management system, and EGR and exhaust system components, operation, diagnosis and service.

DIESEL ENGINES (continued)

6.4L Fuel, Air and Exhaust Systems

The diesel fuel, air and exhaust systems are the backbone of unique diesel engine operation. This course provides the students with a detailed look at the 6.4L Power Stroke® fuel, air and exhaust systems. Included is key information from each system regarding operation, diagnosis and service.

Topics Include:

- Diesel/Gas Engine Similarities and Differences
- 6.4L Fuel Supply System
- 6.4L High-Pressure Fuel System
- 6.4L Fuel Injectors
- Air Management System
- Turbocharger
- Exhaust Gas Recirculation (EGR)
- Electronic Air Management Control
- Air Management System Operation
- Diesel Engine Exhaust Gases
- 6.4L Exhaust System Components
- DPF Regeneration
- Exhaust System Diagnosis
- 6.4L Service Procedures
- Air Management Fault Symptoms
- Turbocharger System Diagnosis

Technical Content: Intermediate to Advanced

Learning Objective: At the conclusion of this course, the student will be able to describe the 6.4L Power Stroke® high-pressure fuel system, air management system, and EGR and exhaust system components, operation, diagnosis and service.

6.7L Power Stroke® Common-Rail Fuel System

The common-rail diesel engine delivers more power to the vehicle while consuming less fuel and producing fewer emissions than previous systems. This course provides a detailed look at the 6.7L Power Stroke® fuel system. The course includes specific information on the 6.7L common-rail fuel system components, operation, electronic control strategies, and diagnosis and service.

Topics Include:

- Fuel Quality
- Low-Pressure Fuel System Components and Operation
- Optimizing Fuel System Performance
- Low-Pressure Fuel System Service
- High-Pressure Fuel System Components and Operation
- Piezo Fuel Injectors Operation and Service
- High-Pressure Fuel System Warnings
- Fuel System Diagnosis and Service

Technical Content: Intermediate to Advanced

Learning Objective: At the conclusion of this course, the student will be able to describe the 6.7L Power Stroke® common-rail fuel system components, operation, diagnosis and service.

DIESEL ENGINES (continued)

6.0L Diesel Hydraulic Electronic Unit Injector (HEUI) Fuel System

The Hydraulic Electronic Unit Injector (HEUI) fuel system creates high-pressure fuel injection from pressurized engine oil. This course specifically describes the 6.0L HEUI fuel system components, operation and diagnosis. It's worth noting that although the information contains 6.0L specifics, a large portion the information can be applied to the 7.3L HEUI fuel system as well.

Topics Include:

- High-Pressure Oil System Components and Operation
- Fuel System Components and Operation
- 6.0L Hydraulic Electronic Unit Injectors (HEUI)
- 6.0L Fuel Management System
- Fuel Injection Control Module (FICM)
- High-Pressure Fuel System Testing
- Fuel Quality
- Fuel System Diagnosis
- High-Pressure Oil System Diagnosis

Technical Content: Advanced

Learning Objective: At the conclusion of this course, the student will be able to describe the 6.0L Power Stroke® Hydraulic Electronic Unit Injector (HEUI) fuel system components, operation, diagnosis and service.

6.0L Power Stroke® Diesel Advanced Diagnosis and Testing

This training offers insight and information on in-depth diagnostic and testing for the 6.0L diesel engine. The course delivers on one of the most common requests for this powerplant, and offers a way for Technicians to boost profit opportunities.

Topics Include:

- Preliminary Diagnostic Procedures
- Fuel System Tests
- High-Pressure Oil System Tests
- EGR Testing
- Hard-Start/No-Start Tests
- Engine Performance Tests
- Additional Tests

Technical Content: Advanced

Learning Objective: Technicians who successfully complete this course will better understand proper diagnosis and testing for the Ford 6.0L diesel engine so that they can complete any necessary repairs on this engine.

Recommended Prior Knowledge: 6.0L and 6.4L Diesel Components and Operation course.

DIESEL ENGINES (continued)

6.4L Power Stroke® Diesel Advanced Diagnosis and Testing

Many aftermarket facilities are beginning to see an increase in 6.4L-equipped Ford vehicles. This course provides in-depth diagnostic methods for this engine.

Topics Include:

- Preliminary Information
- Hard-Start/No-Start Tests
- Diesel Particulate Filter (DPF) Testing and Diagnosis
- Engine Performance Tests
- Additional Tests

Technical Content: Advanced

Learning Objective: Be able to understand advanced, in-depth diagnostic methods for the Ford 6.4L diesel engine.

Recommended Prior Knowledge: 6.0L and 6.4L Diesel Components and Operation course.

6.7L EGR and Exhaust System Operation and Service

The Diesel Aftertreatment System is a series of components that cleans the diesel exhaust emitted by the engine prior to releasing it through the tailpipe and into the atmosphere. Its purpose is to reduce the emission of harmful pollutants into the environment. This course includes 6.7L EGR, DPF and SCR systems components, operation, diagnosis and service.

Topics Include:

- Diesel/Gas Engine Similarities and Differences
- Exhaust Gas Recirculation (EGR) System Components
- EGR-Related Sensors
- EGR System Operation
- Diesel Engine Exhaust Gases
- Aftertreatment System Components
- Diesel Particulate Filter (DPF) Regeneration
- DPF Service
- Selective Catalyst Reduction (SCR) Components
- Diesel Exhaust Fluid (DEF)
- SCR Sensors and Modules
- SCR Operation
- SCR Service
- Exhaust System Symptoms
- Cold Weather Aid Components and Symptoms

Technical Content: Advanced

Learning Objective: At the conclusion of this course, the student will be able to describe the 6.7L Power Stroke® EGR and exhaust system components, operation, diagnosis and service.

DIESEL ENGINES (continued)

6.7L Power Stroke® Diesel Advanced Diagnosis and Service

The 6.7L Power Stroke Diesel® has raised the bar for power, durability and economy for modern diesel-powered vehicles. This course will use diagnostic tools and Service Publications to diagnose concerns on its high-pressure fuel system, Diesel Particulate Filter (DPF) System, Selective Catalytic Reduction (SCR) and Diesel Exhaust Fluid (DEF) Systems.

Topics Include:

- Fuel Control System
- Fuel Delivery Systems
- Selective Catalytic Reduction (SCR) System
- Exhaust Gas Recirculation (EGR) System
- High-Pressure Fuel System
- Engine Misfires
- NOx System and Networks

Technical Content: Advanced

Learning Objective: Provide Technicians with key knowledge on the diagnostic processes that will enable them to more quickly and effectively diagnose and repair the 6.7L Power Stroke® Diesel engine.

7.3L and 6.0L Diesel Engine Repair

This course explains the unique design features of the 7.3L and 6.0L diesel engines. Throughout the course, both 7.3L and 6.0L engine component measurements, service and repair procedures are explained.

Topics Include:

- Diesel Engine Overview
- 7.3L Diesel Engine Short Block
- 7.3L Cylinder Head and Related Components
- 7.3L High- and Low-Pressure Oil Systems
- 7.3L Diagnosis
- 6.0L Diesel Engine Short Block
- 6.0L Cylinder Head and Related Components
- 6.0L Cooling System
- 6.0L Engine Lubrication

Technical Content: Advanced

Learning Objective: At the conclusion of this course, the student will be able to describe the 7.3L and 6.0L diesel engines service and repair procedures.

ELECTRICAL/ELECTRONICS

Advanced Driver Assistance Systems (ADAS)

Today's vehicles are advancing rapidly. Everything from automatic high beams to self-driving technology is utilized. To properly service the latest vehicles, a Technician must understand the operation of the Advanced Driver Assistance Systems (ADAS). This includes the components, networks and operating strategies.

Topics Include:

- Overview of Driver Assist Systems
- Driver Assist System Operation
- Audible Parking Aid System
- Diagnostic Processes and Procedures
- Parking Aid with Camera System
- 360-Degree-View Camera
- Active Park Assist
- Pedestrian Alert System
- Adaptive Cruise Control
- Intelligent Adaptive Cruise Control
- Active Drive Assist (Ford BlueCruise)
- Collision Warning and Collision Avoidance
- Blind Spot Information System (BLIS) with Cross-Traffic Alert (CTA)
- Lane-Keeping System
- Supplemental Brake Assist
- Power Steering Features
- Automatic High Beams

Technical Content: Intermediate

Learning Objective: This course provides students with the foundation required to understand the latest ADAS technologies being used on today's Ford vehicles.

Recommended Prior Knowledge: Working knowledge of vehicle electronics including networks.

Automotive Electronics Operation and Diagnosis

This course presents Technicians who wish to expand or refresh their knowledge and skills with the latest information on modern automotive electrical and electronics components and systems.

Topics Include:

- Electrical Circuit Testing
- Electrical Testing Fundamentals
- Electromechanical Devices
- Diagnostic Processes and Procedures
- Wiring Diagram Utilization and Interpretation
- Module Control of Circuits
- Control Module Strategies and Module Diagnostic Capabilities
- Electronic Signals
- Sensor Operation and Diagnosis
- Input/Output Device Operation, Diagnosis and Testing
- Scan Tool Testing
- Oscilloscope Interpretation
- Charging System Operation and Diagnosis
- Intermittent Electrical/Electronics Diagnosis

Technical Content: Basic to Intermediate

Learning Objective: Provide Technicians with essential, current information on automotive electrical/electronics components and systems.

ELECTRICAL/ELECTRONICS (continued)

Ford Diagnostic and Repair System (FDRS) and VCMM Operation

Starting in 2018, Ford Motor Company began introducing vehicles that require the use of a new, more sophisticated diagnostic Scan Tool software. This program, Ford Diagnostic and Repair System (FDRS), introduces many new features and offers many unique benefits over IDS. This course will describe the use of this program and the capabilities of the new VCMM.

Topics Include:

- Introduction to Ford FDRS
- FDRS Setup, Login and Settings
- FDRS Toolbox
- FDRS Self-Tests
- DTC Types and Interpretation
- FDRS PIDs and Data Recordings
- FDRS System and PID Information
- FDRS Datalogger
- Views, Recordings, Control, File Manager, Output State Control
- Other Tests and Service Functions
- Network Monitor, Power Balance, Relative Compression, Misfire Monitor
- Programmable Module Installation (PMI)
- FDRS Service Functions

Optional Topics of This Course Include:

- VCMM Setup and Connections
- VCMM Oscilloscope Operation and Usage
- VCMM Signal Generator Monitor Tools

Technical Content: Basic to Intermediate

Learning Objective: Provide Technicians with the knowledge needed for the FDRS Program and VCMM Tool.

Ford E-Transit Operation, Diagnosis, and Service

This course includes the knowledge needed to service the Ford E-Transit safely and accurately. Throughout the course, students learn about components and operation of the latest generation of Electric Vehicles. Students are also introduced to the strategies used to diagnose and repair the high-voltage and low-voltage systems found on the E-Transit.

Topics Include:

- History of Ford Electric Vehicles
- Ford E-Transit Overview
- High-Voltage Safety for Service Technicians
- High-Voltage Systems
- Charging
- Cooling Systems
- High-Voltage Diagnosis
- High-Voltage Service
- Low-Voltage Systems
- Networks
- Passive Anti-Theft System (PATS)
- Remote Keyless Entry
- Phone as a Key (PAAK)
- Powertrain
- Regenerative Braking

Technical Content: Advanced

Learning Objective: This course provides Technicians with the fundamentals needed to understand high-voltage operation, and the knowledge required to service the Ford E-Transit safely and accurately.

Recommended Prior Knowledge: Electrical and electronic system operation.

ELECTRICAL/ELECTRONICS (continued)

Ford E-Transit Operation, Diagnosis, and Service

This course includes the knowledge needed to service the Ford E-Transit safely and accurately. Throughout the course, students learn about components and operation of the latest generation of Electric Vehicles. Students are also introduced to the strategies used to diagnose and repair the high-voltage and low-voltage systems found on the E-Transit.

Topics Include:

- History of Ford Electric Vehicles
- Ford E-Transit Overview
- High-Voltage Safety for Service Technicians
- High-Voltage Systems
- Charging
- Cooling Systems
- High-Voltage Diagnosis
- High-Voltage Service
- Low-Voltage Systems
- Networks
- Passive Anti-Theft System (PATS)
- Remote Keyless Entry
- Phone as a Key (PAAK)
- Powertrain
- Regenerative Braking

Technical Content: Advanced

Learning Objective: This course provides Technicians with the fundamentals needed to understand high-voltage operation, and the knowledge required to service the Ford E-Transit safely and accurately.

Recommended Prior Knowledge: Electrical and electronic system operation

Ford Explorer and Lincoln Aviator Hybrid Vehicle Components and Operation

This course will describe the all-new Explorer and Aviator Hybrid systems. This will include the modular 10-speed automatic transmission, 3.0L and 3.3L engines and their systems, new All-Wheel-Drive System and new electric brake booster.

Topics Include:

- Overview of Explorer/Aviator Hybrid Vehicles
- Vehicle Operating Modes
- Gasoline Engine Operation
- Vehicle Service Safety
- High-Voltage System Components and Operation
- High-Voltage System Diagnosis
- Low-Voltage System Components and Operation
- Electronic Cooling System
- Gasoline Engine Components and Operation
- Braking Systems
- AWD System

Technical Content: Basic to Intermediate

Learning Objective: Expand Technician knowledge needed to service the latest hybrid systems from Ford.

Integrated Diagnostic Software (IDS) Operation and Utilization

This training provides insight on how to get the most from your investment in Ford's IDS Scan Tool software. You will learn the most effective use of IDS for day-to-day shop operation.

Topics Include:

- IDS Components
- IDS Preferences
- IDS Vehicle Identification
- Self-Tests
- Datalogger and Parameter IDs (PIDs)
- Data Recording and Playback
- Module Configuration and Programming
- Module Replacement
- System Diagnostics

Technical Content: Basic to Intermediate

Learning Objective: Provide Technicians with key knowledge for the use of the Ford Rotunda Integrated Diagnostic Software (IDS) Scan Tool for optimal utilization.

ELECTRICAL/ELECTRONICS (continued)

Body and Chassis Electrical/Electronics Diagnosis and Service

Body and chassis electronics found on modern vehicles are constantly evolving. This training provides the knowledge and skills essential for Technicians to stay on top of the operation, diagnosis and service of these systems.

Topics Include:

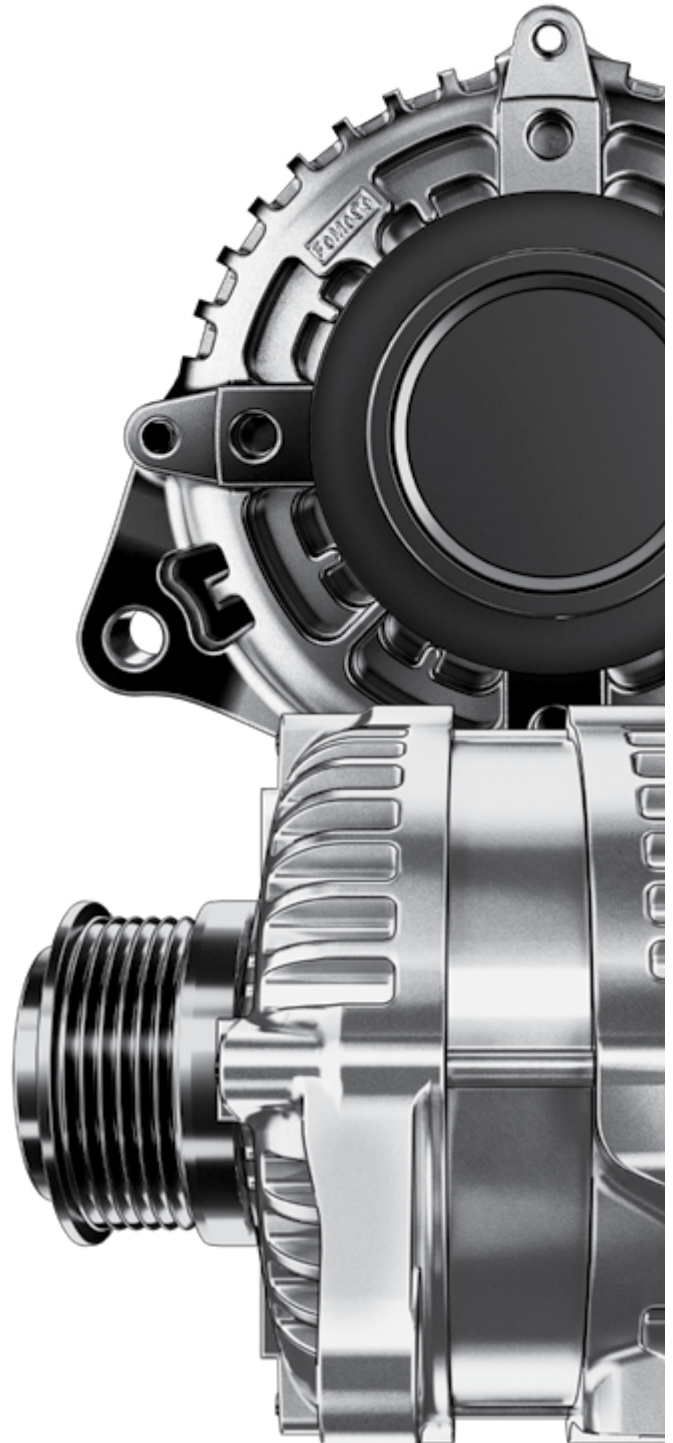
- Using Ford Wiring Diagrams
- Intelligent Access (IA) System
- Push-Button-Start Systems
- Remote Starting Systems
- Auto Start-Stop Systems
- Body Power Opening Systems
- Diagnosis of Body Systems Using Wiring Diagrams
- Saddle Fuel Tanks
- Conventional Speed Control
- Adaptive Cruise Control
- Park Assist
- Blind Spot (BLIS) and Cross-Traffic (CTA) Systems
- Adaptive Headlamps
- Active Grille Shutters (AGS)

Technical Content: Intermediate

Learning Objective: Enhance Technician ability to effectively diagnose and service vehicle electrical/electronics systems.

Recommended Prior Knowledge:

Working knowledge of vehicle electrical/electronics systems.





ELECTRICAL/ELECTRONICS (continued)

Ford High-Voltage Vehicles Components and Operation

This course includes safety, as well as detailed information on hybrids and an introduction to Electric Vehicles. Throughout the course, students learn about the components and operation of both hybrid and Electric Vehicles. High-voltage vehicle technology has become a large part of future service opportunities.

Topics Include:

- Overview of Focus Electric Vehicle (EV) Operation
- Driving a Ford High-Voltage Vehicle
- High-Voltage Vehicle Safety
- Regenerative Braking Operation
- Hybrid Gasoline Engine Operation
- Hybrid Drivetrain
- Focus EV Powertrain
- High-Voltage Electrical System
- Low-Voltage (LV) Systems
- Climate Control System
- Warning Lights and Displays

Technical Content: Intermediate

Learning Objective: Provide Technicians with knowledge on Ford high-voltage vehicle technology components and operation so that they can complete repairs on Ford hybrid and Electric Vehicles.

Networks and Control Module Operation, Diagnosis and Service

Modern vehicles depend on networks and control modules for almost every system. From the wheels to the engine, and everything in between, Service Technicians must understand the operation, diagnosis and service of these systems. This course includes the latest information on electronic automotive networking systems.

Topics Include:

- Overview of Modern Vehicle Networks
- Network Components, Strategies, Symptoms, Diagnosis and Testing
- Identification of Direct and Indirect Inputs and Outputs
- Specialty Modules and Network Circuitry
- Multiple Controller Area Network (CAN) Testing, Operation, Diagnosis and Service
- Network Data Transmission, Commands and Status Messages
- Resolving Scan Tool Communication Issues
- Diagnosing Networks with Digital Multimeter and Oscilloscope
- Using Network Tests to Determine Location of a Network Fault
- Intermittent Network Faults
- Control Module Programming Using Scan Tools
- Module Calibration, Initialization, Parameter Reset, Replacement, Programming and Reprogramming (Using J2534 Devices)
- Automatically and Manually Entering As-Built Data

Technical Content: Intermediate

Learning Objective: Deliver current information to Technicians on electronic networking systems, including components, strategies, symptoms, diagnosis and testing, so that they can properly repair Ford network and control module issues.

Recommended Prior Knowledge: Working knowledge of vehicle electrical/electronics systems.

ENGINE PERFORMANCE AND DRIVEABILITY

Ford EcoBoost® Engine Operation, Diagnosis and Service

The Ford EcoBoost® engine is a prolific, compact and powerful engine found on many modern Ford vehicles, using the latest technology to enhance performance. Understanding how this engine and its systems work is a crucial skill for Technicians who must service them.

Topics Include:

- Benefits of Direct Injection
- Benefits of Turbocharging
- Overview of Gasoline Turbocharged Direct Injection (GTDI) Engine Components
- GTDI and Gasoline Direct Injection (GDI) Operation Overview and Engine Variations
- Low-/High-Pressure Fuel Systems
- Fuel Systems Diagnosis and Testing
- High-Pressure Injector Service
- Turbocharger Components, Operation, Diagnosis and Service
- Intake System
- Speed Density System
- Emissions Systems

Technical Content: Basic

Learning Objective: Technicians will be able to understand how Ford EcoBoost® engine technologies and systems operate so that Technicians can service these popular Ford engines.

Emission Control Relationships for Driveability Diagnosis

Emission-related on-board tests are the basis for OBD II technology. Every Technician that conducts driveability diagnosis must understand how these systems operate, their enabling criteria, and how they prioritize testing. This training describes vehicle symptoms that can occur based on system and operating configuration, not just based on Diagnostic Trouble Codes (DTCs).

Topics Include:

- Vehicle Modes of Operation
- Symptoms of Inaccurate/Degraded Input Signals on Vehicle Operation
- Purpose and Operation of OBD II Monitors
- OBD II Operating Parameters and Limitations
- Function and Operation of Continuous Monitors
- Function and Operation of Non-Continuous Monitors
- New Systems That Are OBD II Monitored
- Enabling Criteria of OBD II Monitors
- Diagnosis of OBD II Monitor Malfunctions

Technical Content: Intermediate

Learning Objective: Technicians will be able to identify symptoms that can occur in modern engine on-board tests based on system and operating configuration.

ENGINE PERFORMANCE AND DRIVEABILITY (continued)

Gasoline Engine Performance and Driveability

Driveability is as much art as science. As vehicles evolve, Technicians that perform this service must also adapt and learn the new technology that impacts vehicle performance. This course will enhance Technician knowledge for diagnosing engine performance and driveability concerns on modern vehicles and systems.

Topics Include:

- Introduction to Driveability
- Diagnosis and Testing Strategy and Process
- Navigation and Utilization of Service Publications
- Diagnostic Trouble Code (DTC) Actuation, Purpose and Category
- Engine Performance Input Device Function, Operation, Testing and Diagnosis
- Fuel System Components, Operation and Strategies
- Oxygen Sensor Types, Operation and Interpretation for Diagnosis
- Fuel Trim Function, Operation and Interpretation for Diagnosis
- DTC Diagnostics for Components and Systems
- Utilizing Wiring Diagrams for Diagnosis of Engine Performance Concerns
- Misfire Symptoms and Diagnosis
- Variable Cam Timing (VCT) Operation, Diagnosis and Service
- Output Device Diagnostic Techniques
- Intermittent Malfunction Diagnostic Techniques

Technical Content: Intermediate

Learning Objective: Technicians will be able to describe driveability symptoms, diagnostic techniques and corrective actions for vehicle performance and driveability concerns.

Recommended Prior Knowledge: Working knowledge of engine operation, OBD II systems and Scan Tool utilization.



MAINTENANCE AND LIGHT REPAIR

Maintenance and Light Repair (MLR) Procedures, Inspections and Service

No matter what new technology is introduced by auto manufacturers, vehicles will always need maintenance and service. And regardless of which company makes the car, they all have similar systems that do specific things: wheels, suspension, brakes and fluids.

Topics Include:

- MLR Technician Skills
- Using MLR Checklists
- Safety, Tools and Service Publications
- MLR Inspection Procedures
- Interior and Underhood Checks
- Tire Inspections
- Brake Inspections
- Under Vehicle Inspections
- Gasoline and Diesel Engine Oil Changes
- Engine Lubrication and Oils
- Tire Service and Repair
- TPMS Service and Repair

Technical Content: Basic

Learning Objective: Provide Technicians with key knowledge in identifying the Maintenance and Light Repair (MLR) tasks and guidelines for several common vehicle systems.

Noise, Vibration and Harshness Diagnosis and Service

Noise, vibration and harshness (NVH) concerns are tricky to diagnose because they represent a customer's perception of an abnormal condition. And causes can range from tires to driveline to wind to suspensions, and more!

This course is designed to teach you about different NVH symptoms, their characteristics and their causes. It will also introduce you to the available tools that Technicians have to pinpoint and correct these issues.

Topics Include:

- NVH Theory and Terminology
- Causes of NVH Symptoms
 - Wheels and Tires
 - Engine
 - Driveline
 - Suspension
 - Brakes
 - Wind Noise
- NVH Diagnostic Process
- Diagnosing NVH Symptoms
- NVH Diagnostic Tools
 - Noise Detectors
 - Vibration Analyzers
 - Vehicle Measurement System (VMS) Tools

Technical Content: Basic to Intermediate

Learning Objective: Provide Technicians with the knowledge needed to service NVH issues on Ford vehicles.

POWERTRAIN

Gasoline Engine Diagnosis and Repair

This course focuses on the diagnosis and repair of late-model Ford gasoline engines and their systems.

Topics Include:

- Scan Tool Engine Testing
- Engine Testing with Gauges
- Engine Pressure Testing
- Engine Leak Testing
- Variable Cam Timing (VCT)
- VCT Operation
- VCT Diagnosis
- VCT Service
- VCT Phaser Replacement
- Noise Testing
- Setting Cam Timing
- Sprocket to Block Cam Timing
- Reference Link Cam Timing

Technical Content: Basic

Learning Objective: Provide Technicians with core diagnosis and repair information related to Ford naturally aspirated gasoline engines.

Automatic Transmission Operation, Diagnosis and In-Vehicle Service

Ford automatic transmissions and transaxles are reliable, durable and designed to handle the stress of all types of consumer and commercial operation. It's important for Service Technicians to know about automatic transmission basic components, operation and diagnostics to help determine the best course of action in diagnosing and servicing Ford vehicles.

Topics Include:

- Automatic Transmission Operation Overview
- Typical Transmission Components
- Torque Converter
- Hydraulic Components and Operation
- Automatic Transmission Electronics
- Solenoid Operation
- Scan Tool Utilization for Diagnosis and Service
- Automatic Transmission Diagnostic Process
- Automatic Transmission In-Vehicle Service
- Fluid Service
- Cooling Systems

Technical Content: Intermediate

Learning Objective: Provide Technicians with automatic transmission basic operation and diagnostics that may be needed when servicing Ford vehicles.

POWERTRAIN (continued)

Four-Wheel-Drive (4x4) and All-Wheel-Drive (AWD) Operation, Diagnosis and Service

Ford began offering four-wheel drive in the 1959 F-250 pickup truck. Since that time, it has been refining and improving four-wheel-drive systems. Today's Ford vehicles use a variety of drivelines to transfer power to the road. This course will cover two Ford drive systems:

- Four-wheel drive (4WD), with a transfer case that sends torque to a front differential
- All-wheel drive (AWD), which uses a Power Transfer Unit (PTU) to transfer torque to the rear wheels

Topics Include:

- Overview of Four-Wheel Drive
- Introduction to All-Wheel Drive (AWD) and Torque Vectoring
- All-Wheel-Drive Components
- Power Transfer Units
- Rear-Wheel-Based AWD System
- Active Torque Coupling (ATC) Control Strategies
- AWD Symptoms, Diagnosis and Service
- Hub Lock Types and Operation
- Wheel Drive Axles
- Transfer Case Components and Operation
- Electronic Four-Wheel-Drive Controls
- Diagnosis and Testing of Four-Wheel-Drive Systems
- Transfer Case Service

Technical Content: Basic to Intermediate

Learning Objective: Provide Technicians with the knowledge needed to service the Four-Wheel-Drive (4x4) and All-Wheel-Drive (AWD) systems on Ford vehicles.



ACRONYMS AND DEFINITIONS

This acronyms and definitions listing contain technical terms applicable to Ford Motor Company products. It is not intended to be an all-inclusive dictionary of components and their functions.

AAT:	Ambient Air Temperature	CO:	Carbon Monoxide
ABS:	Anti-Lock Brake System	CO²:	Carbon Dioxide
AC:	Air Conditioning	COP:	Coil-On-Plug
ACC:	Air Conditioning Clutch	CPP:	Clutch Pedal Position
A/D:	Analog-to-Digital Signal Conversion	CPU:	Central Processing Unit
API:	American Petroleum Institute	CTO:	Clean Tach Output
APP:	Accelerator Pedal Position	DC:	1. Direct Current 2. Duty Cycle
ARC:	Automatic Ride Control	DEPM:	Diesel Engine Power Monitor
A/T:	Automatic Transmission	DFI:	Direct Fuel Injection
ATF:	Automatic Transmission Fluid	DFSO:	Deceleration Fuel Shutoff
AWD:	All-Wheel Drive	DLC:	Data Link Connector
BARO:	Barometric Pressure	DTC:	Diagnostic Trouble Code
BJB:	Battery Junction Box	E10:	Fuel Containing 10% Ethanol
BOO:	Brake On/Off Switch	E85:	Fuel Containing 85% Ethanol
BPA:	Brake Pedal Applied	E100:	Fuel Containing 100% Ethanol
BPP:	Brake Pedal Position	ECT:	Engine Coolant Temperature
BTDC:	Before Top Dead Center	EEC:	Electronic Engine Control
CAC:	Charge Air Cooler	EEGR:	Electric Exhaust Gas Recirculation
CAN:	Controller Area Network	EEPROM:	Electrically Erasable Programmable Read-Only Memory
CARB:	California Air Resources Board	EGR:	Exhaust Gas Recirculation
CCM:	Comprehensive Component Monitor	EGRT:	Exhaust Gas Recirculation Temperature
Cetane:	Additive in Diesel Fuel to Enhance Fuel Burn	EI:	Electronic Ignition
CF:	Cooling Fan	EMD:	Engine Manufacturers Diagnostics
CHT:	Cylinder Head Temperature	EMI:	Electromagnetic Interference
CJB:	Central Junction Box	EONV:	Engine Off Natural Vacuum
CKP:	Crankshaft Position	EOT:	Engine Oil Temperature
CL:	Closed Loop	EP:	Exhaust Pressure
CMP:	Camshaft Position	EPS:	Exhaust Phase Shifting

Acronyms and Definitions

ERFS:	Electronic Returnless Fuel System	HSCAN:	High-Speed CAN
ESOF:	Electronic Shift-on-the-Fly	IAC:	Idle Air Control
ETB:	Electronic Throttle Body	IAT:	Intake Air Temperature
ETBTACM:	Electronic Throttle Body Throttle Actuator Control Motor	IC:	1. Instrument Cluster 2. Integrated Circuit
ETBTPS:	Electronic Throttle Body Throttle Position Sensor	ICM:	Instrument Cluster Module
ETC:	Electronic Throttle Control	ICP:	Injection Control Pressure
EVAP:	Evaporative Emission	IDM:	Injection Driver Module
EVAPCP:	Evaporative Emission Canister Purge Valve	IFS:	Inertia Fuel Shutoff
FAOS:	Fore-Aft Oxygen Sensor	I/M:	Inspection/Maintenance
FEPS:	Flash EEPROM Programming Signal	IMRC:	Intake Manifold Runner Control
FFV:	Flexible-Fuel Vehicle	IMTV:	Intake Manifold Tuning Valve
FLI:	Fuel Level Input	IPC:	Independent Plausibility Checker
FMEM:	Failure Mode Effects Management	IPR:	Injection Control Pressure
FP:	Fuel Pump	IPS:	Intake Phase Shifting
FPDM:	Fuel Pump Driver Module	ISO:	International Standards Organization
FPM:	Fuel Pump Monitor	KAM:	Keep Alive Memory
FRP:	Fuel Rail Pressure	KAPWR:	Keep Alive Power
FRPT:	Fuel Rail Pressure Temperature	KOEO:	Key On Engine Off
FSS:	Fan Speed Sensor	KOER:	Key On Engine Running
FTP:	Fuel Tank Pressure	kPa:	Kilopascal
FWD:	Front-Wheel Drive	K/PH:	Kilometers per Hour
GPCM:	Glow Plug Control Module	KS:	Knock Sensor
GPIL:	Glow Plug Indicator Lamp	lb.-ft.:	Pounds per Foot
GPM:	1. Grams per Mile 2. Gallons per Minute 3. Glow Plug Monitor	LDR:	Low Data Rate
GTDI:	Gasoline Turbocharged Direct Injection	LONGFT:	Long-Term Fuel Trim
GVWR:	Gross Vehicle Weight Rating	MAF:	Mass Airflow
H:	Hydrogen	MAP:	Manifold Absolute Pressure
HC:	1. Hydrocarbon 2. High Compression	MAP/IAT2:	Manifold Absolute Pressure/ Intake Air Temperature 2
HDR:	High Data Rate	MFF:	Misfire Freeze Frame
HO²S:	Heated Oxygen Sensor	MIL:	Malfunction Indicator Lamp
		mm:	Millimeter
		MPH:	Miles per Hour
		MRFS:	Mechanical Returnless Fuel System

MSCAN:	Medium Speed CAN	TACM:	Throttle Actuator Control Motor
MSOF:	Manual Shift-on-the-Fly	TC:	Turbocharger
M/T:	Manual Transmission	TCBP/CACT:	Turbocharger Boost Pressure/ Charge Air Cooler Temperature
NOX:	Nitrogen Oxides	TCBY:	Turbocharger Bypass
NVM:	Non-Volatile Memory	TCIPT:	Turbocharger Intake Pressure and Temperature
NVRAM:	Non-Volatile Random Access Memory	TCM:	Transmission Control Module
OASIS:	Online Automotive Service Information System	TCS:	Transmission Control Switch
OBD:	On-Board Diagnostic	TDC:	Top Dead Center
OL:	Open Loop	TFT:	Transmission Fluid Temperature
ORVR:	On-Board Refueling Vapor Recovery	TIVCT:	Twin Independent Variable Camshaft Timing
OSC:	Output State Control	TP:	Throttle Position
OSR:	On-Board System Readiness	TPPC:	Throttle Plate Position Controller
OSS:	Output Shaft Speed	TR:	Transmission Range
PATS:	Passive Anti-Theft System	TSB:	Technical Service Bulletin
PCM:	Powertrain Control Module	TSS:	Turbine Shaft Speed Sensor
PCV:	Positive Crankcase Ventilation	TWC:	Three Way Catalytic Converter
Pd:	Palladium	VAPS:	Variable-Assist Power Steering
PID:	Parameter Identification	VBAT:	Vehicle Battery Voltage
PIP:	Profile Ignition Pickup	VCT:	Variable Camshaft Timing
PPM:	Parts per Million	VECI:	Vehicle Emission Control Information
PSP:	Power Steering Pressure	VGT:	Variable Geometry Turbocharger
Pt:	Platinum	VID:	Vehicle Identification
PTS:	Professional Technician Society	VIN:	Vehicle Identification Number
PWM:	Pulse-Width Modulation	VR:	Variable Reluctance
PZEV:	Partial Zero Emissions Vehicle	VREF:	Vehicle Reference Voltage
RAM:	Random Access Memory	VSS:	Vehicle Speed Sensor
ROM:	Read-Only Memory	WIF:	Water in Fuel
RPM:	Revolutions per Minute	WOT:	Wide Open Throttle
RWD:	Rear-Wheel Drive		
SAE:	Society of Automotive Engineers		
SFI:	Sequential Multiport Fuel Injection		
SHRTFT:	Short-Term Fuel Trim		
SIGRTN:	Signal Return		
TAC:	Throttle Actuator Control		