

## EMD-567 Diesel Engine Maintenance-Mechanical

**Course Objective:** The student should be able to effectively maintain the Model 8, 12 and 16-EMD-567E diesel engines through the description, maintenance and service data provided and, be aware of special tools needed in maintaining that equipment.

**Who this is for:** Maintenance personnel, foremen or others responsible for the maintenance, inspection and proper repairs to the EMD-567 engine.

Item Code	Lesson Description
D.1	General information, operation, crankcase and oil pan
D.2	Cylinder heads, valve grinding, hydraulic lash adjusters
D.3	Pistons, piston rings, connecting rods
D.4	Cylinder liners
D.5	Crankshaft and accessories
D.6	Camshaft, gear train timing, overspeed trip
D.7	Blower, air intake, exhaust system
D.8	Lubricating oil system
D.9	Cooling system, water pumps
D.10	Fuel systems, injectors, timing, testing, filters
D.11	Speed control, load regulator pilot valve, setting and maintenance
D.12	Protective devices

Item Code	Required Textbook
BKDEM	<i>567E Engine Maintenance Manual</i>
	This book not available separately

Item Code	Full Course Title (Includes Textbook)	Price
D1FC	EMD-567 Diesel Engine Maintenance—Mechanical	\$293.25

Enrolled students may take individual lessons.  
Please contact student services for individual lesson and textbook pricing.

# Locomotive Mechanical

## EMD 645E3 Diesel Engine Maintenance-Mechanical

**Course Objective:** The student will acquire knowledge of maintenance for the 8, 12, 16 and 20 cylinder Model 645E3 diesel engines and be aware of any special tools required in the maintenance of these engines. Use the specifications and service data provided in the text book in maintaining the engines and quick reference.

**Who this is for:** Maintenance personnel, foremen, inspectors, or anyone else responsible for the correct maintenance of the 645E3 diesel motors.

Item Code	Lesson Description
DM.30A	General description, operation, engine data
DM.31A	Crankcase, oil pan
DM.32A	Cylinder head and accessories, valve grinding
DM.33A	Pistons, connecting rods
DM.34A	Cylinder liners
DM.35A	Crankshaft, accessories, main bearing
DM.36A	Crankshaft, gear train
DM.37A	Air intake, exhaust system, turbocharger
DM.38A	Lubricating oil system, oil pumps
DM.39A	Cooling system, water pumps, aftercoolers
DM.40A	Fuel system, injectors, filters
DM.41A	Governor
DM.42A	Protective devices
DM.43A	Starting systems

Item Code	Required Textbook
BK645E3	<i>EMD 645E3 Turbocharged Engine Maintenance Manual</i>

**NOTE: Students must contact EMD for the textbook**

Item Code	Full Course Title	Price
DM30AFC	EMD 645E3 Diesel Maintenance Manual	\$308.00

## Basic Diesel Theory

**Course Objective:** Gain advance knowledge of the theory of modern engines and become familiar with how they work, its significance in a practical sense.

**Who this is for:** Anyone wishing to become more conversant with the workings of modern engines and how they apply those forces to our modern world.

Item Code	Lesson Description
DT.1	History and development, power terms defined
DT.2	Engine efficiency and construction, engine timing, timing diagrams
DT.3	Engine combustion, fuel injection systems and equipment
DT.4	Induction systems, lubrication, cooling systems and speed control

Item Code	Required Textbook
BKDT	<i>Modern Diesel Theory</i>
	Course under revision, please call for availability

Item Code	Full Course Title (Includes Textbook)	Price
DT1FC	Basic Diesel Theory	\$107.95

Enrolled students may take individual lessons.  
Please contact student services for individual lesson and textbook pricing.

# Locomotive Mechanical

## Diesel Engine Maintenance for EMD Model 710G3

**Course Objective:** The student will become familiar with the maintenance information for the 8, 12, 16 and 20-cylinder Model 710G3 diesel engines. Learn about the basic engine and common extra equipment, use illustrations which depict the 16-cylinder model as representative of the location, size, and relative shape of various components and accessories.

**Who this is for:** Maintenance personnel, foremen, inspectors, or anyone else responsible for the correct maintenance of 8, 12, 16, and 20-cylinder Model 710G3 diesel engines.

Item Code	Lesson Description
DM.1A	Engine information, service data
DM.2A	Crankcase and oil pan
DM.3A	Cylinder head and accessories, valve grinding
DM.4A	Piston assembly and connecting rods
DM.5A	Cylinder liner
DM.6A	Cylinder power assembly
DM.7A	Crankshaft, accessories, main bearings
DM.8A	Camshaft, gear train
DM.9A	Air intake, exhaust system, turbocharger
DM.10A	Lubricating oil system, oil pumps
DM.11A	Cooling system, water pump, aftercooler
DM.12A	Fuel systems, injectors, filters
DM.13A	Governor
DM.14A	Protective devices
DM.15A	Troubleshooting

Item Code	Required Textbook
BK710G3	<i>710G3/G3A Engine Maintenance Manual — Turbocharged</i>

**NOTE: Students must contact EMD for the textbook**

Item Code	Full Course Title	Price
DM1AFC	Diesel Engine Maintenance for EMD Model 710G3	\$330.00

## Locomotive Draft Gears

**Course Objective:** Introduce the student to a general concept of locomotive draft gears; their inspection and removal. Explain, the functions of the components of draft gears; their inspection and removal. Gives a detailed description for the inspection, maintenance and reconditioning of locomotive draft gears used on the locomotives built by Electro-Motive Division of General Motors Corporation and on those built by General Electric Company.

**Who this is for:** Carmen, apprentices, shop foremen, or anyone who works on locomotive draft gears or wishes to gain a better understanding of them.

Item Code	Lesson Description
DG.1	General Information-Operation
DG.2	Maintenance-Parts Information

Item Code	Required Textbook
BKLDG	<i>Locomotive Draft Gears</i>
Course under revision, please call for availability	

Item Code	Full Course Title (Includes Textbook)	Price
DG1FC	Locomotive Draft Gears	Call for price

Enrolled students may take individual lessons.  
Please contact student services for individual lesson and textbook pricing.

# Locomotive Mechanical

## Diesel and High-Compression Gas Engine Fundamentals

**Course Objective:** The student will receive complete clarification of the diesel engine, its stationary parts and an explanation in simple terms of the major moving parts and their lubrication. Basic terms of physics and engineering, fuel systems, engine power and rating performances, testing, instrumentation, maintenance and troubleshooting and auxiliary systems.

**Who this is for:** Carmen, apprentices, shop foremen, students of diesel engines, diesel mechanics and others wanting a good basic understanding of the diesel engine, its components and how it works.

Item Code	Lesson Description
DH.1	Distinguishing features of diesel engines, what a diesel engine is
DH.2	Basic construction of a diesel engine, classification of diesel engines
DH.3	Stationary parts; frames, cylinders, and heads; major moving parts
DH.4	Lubricating the diesel, basic terms of physics and engineering
DH.5	Heat and combustion, oil and gaseous fuels
DH.6	Engine power and fuel consumption, engine rating
DH.7	Intake and exhaust systems, scavenging and supercharging, injecting fuel
DH.8	Burning the fuel, governing
DH.9	Diesel engine testing, instrumentation and designs, high-compression gas-burning engines
DH.10	Auxiliary systems, operation and maintenance

Item Code	Required Textbook
BKDH BK	<i>Diesel and High Compression Gas Engines</i>

Item Code	Full Course Title (Includes Textbook)	Price
DH1FC	Diesel and High Compression Gas Engines	\$260.75

Enrolled students may take individual lessons.  
Please contact student services for individual lesson and textbook pricing.

## EMD Maintenance-Mechanical

**Course Objective:** Use the pictures, diagrams and detailed instructions to gain an understanding of particular areas of mechanical maintenance i.e., various types of journal boxes, types of locomotive truck assemblies, wheels, axles, pinions and alignment of locomotive rotating equipment.

**Who this is for:** Carmen, apprentices, maintenance personnel interested in gaining information in a particular area or type of equipment.

**Note:** Lessons MM.20 and MM.21 must be sold together.

Item Code	Lesson Description
MM.11	New departure, Hyatt journal boxes with resilient rubber thrust units
MM.20	Locomotive truck assemblies, swing hanger and switcher trucks
MM.21	Locomotive truck assemblies, swing hanger and switcher trucks
MM.22	Locomotive truck assemblies and Flexcoil switcher trucks
MM.23	Wheels, axles, axle gear, and pinions
MM.50	Alignment of rotating equipment

Item Code	Full Course Title (Includes Textbook)	Price
MM11FC	EMD Maintenance—Mechanical	\$167.00

Enrolled students may take individual lessons.  
Please contact student services for individual lesson and textbook pricing.

# *Locomotive Mechanical*

## **EMD-GP-38 Locomotive Maintenance-Mechanical**

**Course Objective:** Provide the student with the basis to perform “on-the-locomotive” maintenance, along with instructions for testing and adjustment of systems for both mechanical and electrical maintenance. Use service data pages for reference.

**Who this is for:** Maintenance personnel, foreman responsible for the maintenance, repair, servicing and/or repair of EMD-GP38.

Item Code	Lesson Description
GP.1M	Fuel system and engine starting
GP.2M	Lubricating oil system
GP.3M	Cooling system
GP.4M	Central air system
GP.5M	Compressed air system

Item Code	Required Textbook
BKGP38M	<i>EMD Locomotive Service Manual GP38 with Static Excitation</i>
	This book is not available separately

Item Code	Full Course Title (Includes Textbook)	Price
GP1MFC	EMD GP-38 Locomotive Maintenance—Mechanical	\$133.25

Enrolled students may take individual lessons.  
Please contact student services for individual lesson and textbook pricing.



## Guide to Locomotive Mechanical Maintenance on SD and GP Type Locomotives

**Course Objective:** The student will gain an understanding of the bottom to top items to check for when doing scheduled maintenance work. The booklet is designed as a job aid in performing locomotive mechanical scheduled maintenance work on General Motors SD and GP type locomotives.

**Who this is for:** All mechanical department personnel responsible for the inspection and maintenance of locomotives.

Item Code	Lesson Description
GLMM.1A	Wheel defects and gauging
GLMM.2A	Truck component defects, truck assemblies
GLMM.3A	Underframe
GLMM.4A	Air dryer inspection, truck center plate lubrication, engine checks, filter maintenance, exhaust system, and engine room check
GLMM.5A	Car body, running work and air brake test

Item Code	Required Textbook
BKGLMM	<i>Guide to Locomotive Mechanical Maintenance</i>

Item Code	Full Course Title (Includes Textbook)	Price
GLMM1AFC	Guide to Locomotive Mechanical Maintenance	\$141.25

Enrolled students may take individual lessons.  
Please contact student services for individual lesson and textbook pricing.

# *Locomotive Mechanical*

## **GE Dash 8 Locomotives–Mechanical and Electrical**

**Course Objective:** The student will study the principles of maintenance on General Electric 1987 Series-8 Locomotives and learn about any special tools required to properly maintain GE locomotives. Be aware of warnings, cautions, or hazards and additional clarifications when performing maintenance.

**Who this is for:** Maintenance personnel, foremen, inspectors or anyone responsible for the maintenance of GE DASH 8 Locomotives.

<b>Item Code</b>	<b>Lesson Description</b>
DS.1	Introduction
DS.2	Diagnostic display panel (Level 1)
DS.3	Diagnostic display panel (Level 2)
DS.4	Engine support systems
DS.5	Locomotive electrical systems operation and locomotive engine overspeed system
DS.6	Nose, operator, dynamic braking, engine and radiator cab equipment
DS.7	Locomotive alternator blower, removal and installation, locomotive equipment blower 1, air compressor removal and installation
DS.8	Victaulic couplings, radiator removal and installation of locomotive radiator fan
DS.9	26L air brake system, air supply system and air compressors
DS.10	Trucks

*Course continued on facing page*

# ***Locomotive Mechanical***

## *GE Dash 8 Locomotives—Mechanical and Electrical continued*

<b>Item Code</b>	<b>Lesson Description</b>
DS.11	Traction motors, running maintenance, traction motor installation and removal
DS.12	5GMG186 and 5GMG187 alternators, load and insulation testing
DS.13	Control and power devices
DS.14	Description of electrical equipment, power cable termination and connection
DS.15	Diesel engine checks and adjustments
DS.16	Diesel engine replacements

<b>Item Code</b>	<b>Required Textbook</b>
BKDS BK	<i>GE Dash 8 Locomotive Service Manual</i>
	<b>This book is not available separately</b>

<b>Item Code</b>	<b>Full Course Title (Includes Textbook)</b>	<b>Price</b>
DS1FC	GE Dash 8 Locomotives—Mechanical and Electrical	\$391.00

Enrolled students may take individual lessons.  
Please contact student services for individual lesson and textbook pricing.

# Locomotive Mechanical

## EMD 645/F3B Turbocharged Engine Maintenance

**Course Objective:** Study the maintenance for the 8, 12, 16, and 20 cylinder Model 645E3C and Model 645F3B diesel engines and be aware of any special tools required in use of that maintenance. Also, be able to use references, specifications, and a list of service equipment presented in the Service Data at the end of most sections.

**Who this is for:** Mechanical maintenance personnel, foremen, inspectors or others responsible for the repair or servicing of EMD 645F3B diesel engines.

Item Code	Lesson Description
TE.1	General description, operation, engine data
TE.2	Crankcase, oil pan
TE.3	Cylinder head and accessories, valve grinding
TE.4	Pistons, connecting rods
TE.5	Cylinder liners
TE.6	Cylinder power assembly
TE.7	Crankshaft, accessories, main bearings
TE.8	Camshaft, gear train
TE.9	Air intake, exhaust system, turbocharger
TE.10	Lubricating oil system, oil pumps
TE.11A	Cooling system, water pump, aftercooler
TE.12	Fuel system, injectors, filters
TE.13	Governor
TE.14	Protective devices
TE.15	Starting system

Item Code	Required Textbook
BKDM BK	<i>645E3C/F3B Turbocharged Engine Maintenance Manual</i>

**NOTE:** Students must contact EMD for the textbook

Item Code	Full Course Title	Price
TE1FC	EMD 645/F3B Turbocharged Engine Maintenance	\$330.00

## EMD-MP15 Locomotive Maintenance

**Course Objective:** Have knowledge of both the mechanical and electrical maintenance necessary on an EMD-MP 15 Locomotive. Use the service data provided at the end of each section of the manual in maintaining the EMD-MP 15 locomotive.

**Who this is for:** Mechanics, electrical, apprentices or anyone involved with the maintenance of an EMD-MP 15 Locomotive.

Item Code	Lesson Description
MP.1	Information, fuel system and engine starting
MP.2	Lubricating oil system, cooling system
MP.3	Central air system, compressed air system
MP.4	Excitation control system and contact tips
MP.5	Electrical equipment
MP.6	Testing and setting power control, wheel slip detection and control and transition control systems, load test and horsepower standardization high potential tests

Item Code	Required Textbook
BKMP15	<i>MP 15 Locomotive Service Manual</i>

Item Code	Full Course Title (Includes Textbook)	Price
MP1FC	EMD MP 15 Locomotive Maintenance	\$159.50

Enrolled students may take individual lessons.  
Please contact student services for individual lesson and textbook pricing.

# Locomotive Mechanical

## GP50 Locomotive-Mechanical and Electrical Maintenance

**Course Objective:** Provide, from a servicing standpoint, a general familiarity with EMD locomotive systems and equipment, instructions for electrical and mechanical maintenance that can be performed on the locomotive. Use service data pages as reference and metric conversion table.

**Who this is for:** Mechanical maintenance personnel, foremen or others responsible for servicing and maintaining the GP50 Locomotive.

Item Code	Lesson Description
G.1	General information, engine starting
G.2	Fuel oil system, lubrication oil system
G.3	Cooling system
G.4	Central air system
G.5	Compressed air system
G.6	Compressed air system
G.7	Electrical equipment: AR15 generator, voltage suppression, D14 alternator, traction motors, fans, pumps
G.8	Electrical equipment: locomotive control stand, assembly, dynamic brake throttle and reverser handles, air gauges, panel lights

*Course continued on facing page*

# Locomotive Mechanical

## *Guide to GP50 Locomotive-Mechanical and Electrical Maintenance continued*

Item Code	Lesson Description
G.9	Electrical equipment: engine panel lights, gauges and what they mean, switches, circuit breaker panels
G.10	Electrical equipment: generator field, fuse test equipment and switch panel, electrical devices located in the main electrical cabinet
G.11	Electrical devices ETS to TLTD located in the main electrical cabinet
G.12	Electrical cabinet TSR to WL, pneumatic devices, hose systems, ground relay protection system, main generator and dynamic braking grid grounds, wheel creep control system
G.13	Radar Module RA, Motor E/N generator module, current maximizer module
G.14	Electrical control system, wheel slip system
G.15	Wheel overspeed module, load control module, dynamic brake system module and dynamic brake protection module
G.16	Load test and horsepower standardization, high potential test for locomotives in service

Item Code	Required Textbook
BKGP50	<i>GP50 Locomotive Service Manual</i>

**NOTE: Students must contact EMD for the textbook**

Item Code	Full Course Title	Price
G1FC	GP50 Locomotive—Mech. and Elec. Maintenance	\$352.00

Enrolled students may take individual lessons.  
Please contact student services for individual lesson pricing.

# Locomotive Mechanical

## EMD SD50 Locomotive Maintenance-Mechanical

**Course Objective:** Gain a general familiarity with EMD locomotive systems and equipment and study the electrical and mechanical maintenance that can be performed on the locomotive. Use the service data pages provided as references along with the metric conversion table as needed.

**Who this is for:** Maintenance personnel, foremen or others responsible for the maintenance of the EMD SD50 Locomotive.

Item Code	Lesson Description
SD.50	Engine starting, fuel oil system
SD.51	Lubricating oil system, cooling system
SD.52	Central air system, compressed air system
SD.53	Electrical equipment
SD.54	Electrical equipment
SD.55	Electrical control equipment, Super series wheel creep control system
SD.56	Motor E/N generator module EN, current maximizer module CM, generator feedback module FG
SD.57	Motor feedback module FM, wheel slip correction system, starting wheel slip module SQ, sanding module 8A
SD.58	Load control system section 8C introduction, load control module LC, motor temperature simulator module MS
SD.59	Sensor module SE and SCR assembly, barometric compensation module BC, generator transition control module TR
SD.60A	Excitation limit module EL, dynamic brake system, dynamic brake regulator module DR
SD.61A	Dynamic brake protection module DP, dynamic brake extended range module DE, load test and horsepower standardization, high potential test for locomotives in service

Item Code	Required Textbook
BKSD50BK	<i>SD50 Locomotive Service Manual</i>
	<b>NOTE: Students must contact EMD for the textbook</b>

Item Code	Full Course Title	Price
SD50FC	EMD SD50 Locomotive Maintenance-Mechanical	\$264.00



## SD60M Locomotive Service

**Course Objective:** Gain an overview of EMD locomotive systems and equipment as well as specific electrical and mechanical procedures which can be performed on board the locomotive. Also, get an introduction to the computer control system and representative circuitry. Use service data references and metric conversion tables as needed.

**Who this is for:** ‘Qualified’ service personnel.

‘Qualified’, for the purpose of this lesson means skilled personnel, knowledgeable in proper safety procedures and trained to perform maintenance on GM/EMD 60 Series computer-controlled locomotive(s).

Item Code	Lesson Description
SD.60M	Forward and general locomotive information, engine starting
SD.61M	Fuel oil system
SD.62M	Lubricating oil system
SD.63M	Cooling system
SD.64M	Central air system
SD.65M	Compressed air system
SD.66M	Electrical equipment
SD.67M	Electrical equipment
SD.68M	Electrical equipment
SD.69M	Electrical control system
SD.70M	Electrical control system
SD.71M	Load test and horsepower calculating, high potential test for locomotive service, metric conversion, logic system troubleshooting

Item Code	Required Textbook
BKSD60BK	<i>SD60M Locomotive Service Manual</i>

**NOTE: Students must contact EMD for the textbook**

Item Code	Full Course Title	Price
SD60MFC	SD60M Locomotive Service	\$264.00

# Locomotive Mechanical

## Woodward Governor Maintenance

**Course Objective:** The student will study the manual on the PGEV and PGE Locomotive Governors with all parts listed, how to tear it down, put it back together, install/maintain the governors, perform various tests and do troubleshooting.

**Who this is for:** Mechanics, maintenance personnel, shop foremen or others who work on the PGEV or PGE Locomotive Governors.

Item Code	Lesson Description
PG.1	General Information
PG.2	Basic operation
PG.3	Basic operation
PG.4	Troubleshooting

Item Code	Required Textbook
BKPG BK	<i>Woodward—PGEV and PGE Locomotive Governors</i>

Item Code	Full Course Title (Includes Textbook)	Price
PG1FC	Woodward Governor Maintenance	\$106.95

Enrolled students may take individual lessons.  
Please contact student services for individual lesson and textbook pricing.

## FRA Railroad Safety Appliance Standards-Locomotives

**Course Objective:** Use the Federal Railroad Administration regulations as a resource for: proper-number, dimensions, location, and manner of application of various parts of the locomotive.

**Who this is for:** Repairmen, mechanics, or other workers responsible for the correct/standard of repair and safe operating condition of the various parts of the locomotive.

Item Code	Lesson Description
SA.3C	Road locomotives with corner stairways, locomotives used in switching service

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Item Code	Required Textbook
BKSAS	<i>Safety Appliance Standards (Code of Federal Regulations)</i>

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Item Code	Full Course Title (Includes Textbook)	Price
SA3CFC	FRA RR Safety Appliance Standards—Locomotives	\$29.95

Enrolled students may take individual lessons.  
Please contact student services for individual lesson and textbook pricing.

# Locomotive Mechanical

## Diesel Electric Locomotive Maintenance

**Course Objective:** Study schematics and the explanation of parts of the power plant for the various locomotives, preliminary checkup before starting the engine, starting engines, troubleshooting the engine, moving and stopping the locomotive and shutting the engine down.

**Who this is for:** Anyone who has reason to learn the maintenance of the locomotives with the particular engines mentioned in the lesson material. (Personnel familiar with the operation of large equipment).

Item Code	Lesson Description
N.22-1	Power plants of Electro-Motive switchers, 1,000 and 600 hp
N.22-2	Electro-Motive switchers, 1,200 and 800 horsepower plants
N.25	E7 passenger locomotives
N.41	Electro-Motive GP9 locomotives
N.42	Electro-Motive GP9 locomotive, power details, troubleshooting

\* A separate booklet is required for each lesson

Item Code	Full Course Title (Includes Textbook)	Price
N22FC	Diesel Electric Locomotive Maintenance	\$155.00

Enrolled students may take individual lessons.  
Please contact student services for individual lesson and textbook pricing.

# Locomotive Mechanical

## General Electric Mechanical Maintenance for Series-7 Road Locomotives

**Course Objective:** Study how to maintain “running maintenance” on General Electric Series-7 Locomotives built since January, 1977. Become familiar with major locomotive equipment’s and systems of the standard Series-7 locomotive and frequently installed optional equipment. “Running maintenance” is defined as maintenance done on board the locomotive and which can ordinarily be done in eight hours or less time.

**Who this is for:** Mechanical maintenance personnel responsible for the servicing and maintenance of GE SERIES-7 Road Locomotives.

Item Code	Lesson Description
JM.1A	Data-qualification and troubleshooting systems
JM.2A	Cabs and underframes
JM.3A	Air brake equipment
JM.4A	Diesel engine: servicing and inspecting engine oil and water, overspeed crankcase, and governor
JM.5A	Diesel engine: differential pressure, fuel oil system, crankcase cylinder, gear assemblies
JM.6A	Diesel engine: adjustments, fuel pump, lube oil and fuel oil valves, valve tappet clearance
JM.7A	Diesel engines: fuel oil valves, replacements of fuel oil filters, strainers, fuel injection nozzle and pump, water and lubricating oil pump, power assembly removal and installation
JM.8A	Diesel engine: pistons, rods, bearings, overspeeds, crankcase, governor, exhaust manifold and turbochargers

Item Code	Required Textbook
BKSERIES7	<i>Locomotive Service Manual Running Maintenance and Troubleshooting for Series-7 Road Locomotives</i>

Item Code	Full Course Title (Includes Textbook)	Price
JM1AFC	GE Mechanical Maint. for Series-7 Road Locomotives	\$216.50

# Locomotive Mechanical

## SD70 MAC Locomotive Mechanical

**Course Objective:** To train locomotive personnel in the repair and troubleshooting of the SD70 MAC locomotive. Giving a complete review of the locomotive components and mechanical systems.

**Who this is for:** Mechanical maintenance personnel responsible for the servicing and maintenance of SD70 MAC locomotives.

Item Code	Lesson Description
MAC70M.1	General information
MAC70M.2	Engine starting and stopping
MAC70M.3	Fuel system
MAC70M.4	Lubricating oil system
MAC70M.5	Cooling system, forced air system
MAC70M.6	Compressed air systems
MAC70M.7	Compressed air systems
MAC70M.8	HTCR radial truck
MAC70M.9	Functionally integrated rail electronics (FIRE)
MAC70M.10	Integrated cab electronics (ICE) and locomotive data screens
MAC70M.11	Locomotive data screens (FIRE and ICE)
MAC70M.12	Load test and horsepower evaluations
MAC70M.13	Troubleshooting: heating, ventilation, air conditioning systems, and Microflush half-gallon toilet

Item Code	Required Textbook
BKSD70MAC	<i>SD70 MAC Locomotive Service Manual</i>
	<b>NOTE: Students must contact EMD for the textbook</b>

Item Code	Full Course Title	Price
MAC70M1FC	SD70 MAC Locomotive Mechanical	\$286.00

Enrolled students may take individual lessons.  
Please contact student services for individual lesson pricing.

## FRA Railroad Locomotive Safety Standards and Locomotive Inspection

**Course Objective:** This course is designed for the student to develop an understanding of the safety rules and regulations based on the FRA (Federal Railroad Administration) Locomotive Safety Standards and Locomotive Inspection.

**Who this is for:** Engineers, inspectors, supervisors and others responsible for the safe operation and regulations of running locomotives.

Item Code	Lesson Description
LSSH.1	Locomotive Safety Standards-locomotive inspection
LSSH.2	Locomotive Safety Standards-safety requirements-brake system, draft system, suspension system
LSSH.3	Locomotive Safety Standards-safety requirements-electrical system, internal combustion system, steam generators, cabs and cab equipment

Item Code	Required Textbook
BKLSS	<i>Locomotive Safety Standards and Locomotive Inspection (Code of Federal Regulations)</i>

Item Code	Full Course Title (Includes Textbook)	Price
LSSH1FC	RR Loco. Safety Standards and Loco. Inspection	\$74.25

Enrolled students may take individual lessons.  
Please contact student services for individual lesson and textbook pricing.

# Locomotive Mechanical

## EMD SD40-2 Locomotive Maintenance-Mechanical

**Course Objective:** The student will gain an understanding of mechanical and electrical maintenance for “on-the-locomotive” maintenance, applicable to the basic locomotive and common extra equipment and be generally familiar with locomotive components and systems

**Who this is for:** Maintenance personnel, foreman or others responsible for the maintenance and service of EMD SD40-2 Locomotives.

Item Code	Lesson Description
SD.1M	Fuel system and engine starting
SD.2M	Lubricating oil systems
SD.3M	Cooling system
SD.4M	Central air system
SD.5M	Compressed air system

Item Code	Required Textbook
BKSD ME	<i>SD40-2 Locomotive Service Manual</i>
	This book is available separately

Item Code	Full Course Title (Includes Textbook)	Price
SD1MFC	EMD SD40-2 Locomotive Maintenance—Mechanical	\$134.00

Enrolled students may take individual lessons.  
Please contact student services for individual lesson and textbook pricing.



## Basics of Railroad Wheels

**Course Objective:** Recognize wheel types, reasons for the differences, how to distinguish and classify wheels by size, material, method of manufacture and design differences. Inspect and identify wheel defects (per Federal Railroad Administration), learn and use the various types of gages for measuring wheel defects. Use tables for Association of American Railroads (AAR) Why Made Codes and learn Railroad and/or Shop Identifying marks. Use this standard reference by the AAR for all railroad wheel and axle work.

**Who this is for:** Railroad Mechanical Department Supervisors, inspectors, craftsmen and other railroad employees involved in the safe and proper maintenance of wheels.

Item Code	Lesson Description
RW.1	History and types of wheels
RW.2	Wheel manufacturing and markings
RW.3	Wheel inspection and defects
RW.4	Wheel defects

Item Code	Required Textbook
BKWHEEL	<i>The Basics of Railroad Wheels and Wheel Inspection</i>

Item Code	Full Course Title (Includes Textbook)	Price
RW1FC	Basics of Railroad Wheels	\$105.50

Enrolled students may take individual lessons.  
Please contact student services for individual lesson and textbook pricing.

# Locomotive Mechanical

## EMD-SD45 Locomotive Maintenance-Mechanical

**Course Objective:** Provides the student with the basis to perform “on-the-locomotive” maintenance, along with instructions for testing and adjustment of systems. Also, use service data pages for reference.

**Who this is for:** Maintenance personnel, foremen or others responsible for the maintenance of EMD-SD45.

Item Code	Lesson Description
LS.1M	Fuel system
LS.2M	Lubricating oil system
LS.3M	Cooling system
LS.4M	Central air system
LS.5M	Compressed air system

Item Code	Required Textbook
BKSD45M	<i>SD45 Locomotive Service Manual</i> This book not available separately

Item Code	Full Course Title (Includes Textbook)	Price
LS1MFC	EMD SD45 Locomotive Maintenance—Mechanical	\$134.00

Enrolled students may take individual lessons.  
Please contact student services for individual lesson and textbook pricing.

# Locomotive Mechanical

## Locomotive Truck Assemblies

**Course Objective:** To inspect trucks, their components, disassemble, repair/rebuild, understand and follow recommended practices and procedures for locomotive trucks.

**Who this is for:** Mechanics, inspectors, foremen and others responsible for maintenance or repair of locomotive trucks.

Item Code	Lesson Description
LT.1	Introduction, GE two- and three-axle floating bolster truck assembly
LT.2	GE locomotive trucks; swing bolster and spring rigging, pedestal guide and wear plates, and truck removal
LT.3	GM-EMD GP truck assembly with single brake shoe rigging
LT.4	GM-EMD HT-C truck assembly; locomotive swing hanger truck assemblies with clasp brakes

Item Code	Required Textbook
BKLTA	<i>Locomotive Truck Assemblies</i>

Item Code	Full Course Title (Includes Textbook)	Price
LT1FC	Locomotive Truck Assemblies	\$101.75

Enrolled students may take individual lessons.  
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# Locomotive Mechanical

## Roller Bearing Maintenance

**Course Objective:** The goal of this course is to have an understanding of the mandatory standards, recommended practices and general information of journal bearings. Also, the best possible shop requirements; some field practices for inspection, reconditioning, repairing, assembly and lubrication of journal roller bearings.

**Who this is for:** Anyone responsible for the inspection and maintenance of journal roller bearings.

Item Code	Lesson Description
RB.11C	Mandatory instruction and practices
RB.12C	Terminology and explanation of bearing damage
RB.13C	Review of AAR Roller Bearing Manual

Item Code	Required Textbook
BKRB BK	<i>Rolling Bearing Manual (AAR Manual of Standards)</i>
	This book not available separately

Item Code	Full Course Title (Includes Textbook)	Price
RB11CFC	Roller Bearing Maintenance	\$153.00

Enrolled students may take individual lessons.  
Please contact student services for individual lesson and textbook pricing.

## EMD 645E3C Engine – GM

**Course Objective:** The student will gain experience in the maintenance for the 8, 12, 16, and 20 cylinder Model 645E3C and Model 645F3B diesel engines and be aware of any special tools required in use of that maintenance. Also, be able to use references, specifications and a list of service equipment presented in the Service Data at the end of most sections.

**Who this is for:** Mechanical maintenance personnel, foremen, inspectors or others responsible for the repair or servicing of EMD 645E3C diesel engines.

Item Code	Lesson Description
DM.81	General description, operation, engine data
DM.82	Crankcase, oil pan
DM.83	Cylinder head and accessories, valve grinding
DM.84	Pistons, connecting rods
DM.85	Cylinder liners
DM.86	Cylinder power assembly
DM.87	Crankshaft, accessories, main bearings
DM.88	Camshaft, gear train
DM.89	Air intake, exhaust system, turbocharger
DM.90	Lubricating oil system, oil pumps
DM.91A	Cooling system, water pump, aftercooler
DM.92	Fuel system, injectors, filters
DM.93	Governor
DM.94	Protective devices
DM.95	Starting systems

Item Code	Required Textbook
BKDM BK	<i>645E3C/F3B Turbocharged Engine Maintenance Manual</i>

**NOTE: Students must contact EMD for the textbook**

Item Code	Full Course Title	Price
DM81FC	EMD 645 E3C Engine Manual — GM	\$330.00