



GHADDAR
MACHINERY CO.



TRAINING MANUAL

ENGINE & NON-ENGINE COURSES

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Outline

Engine Training Courses

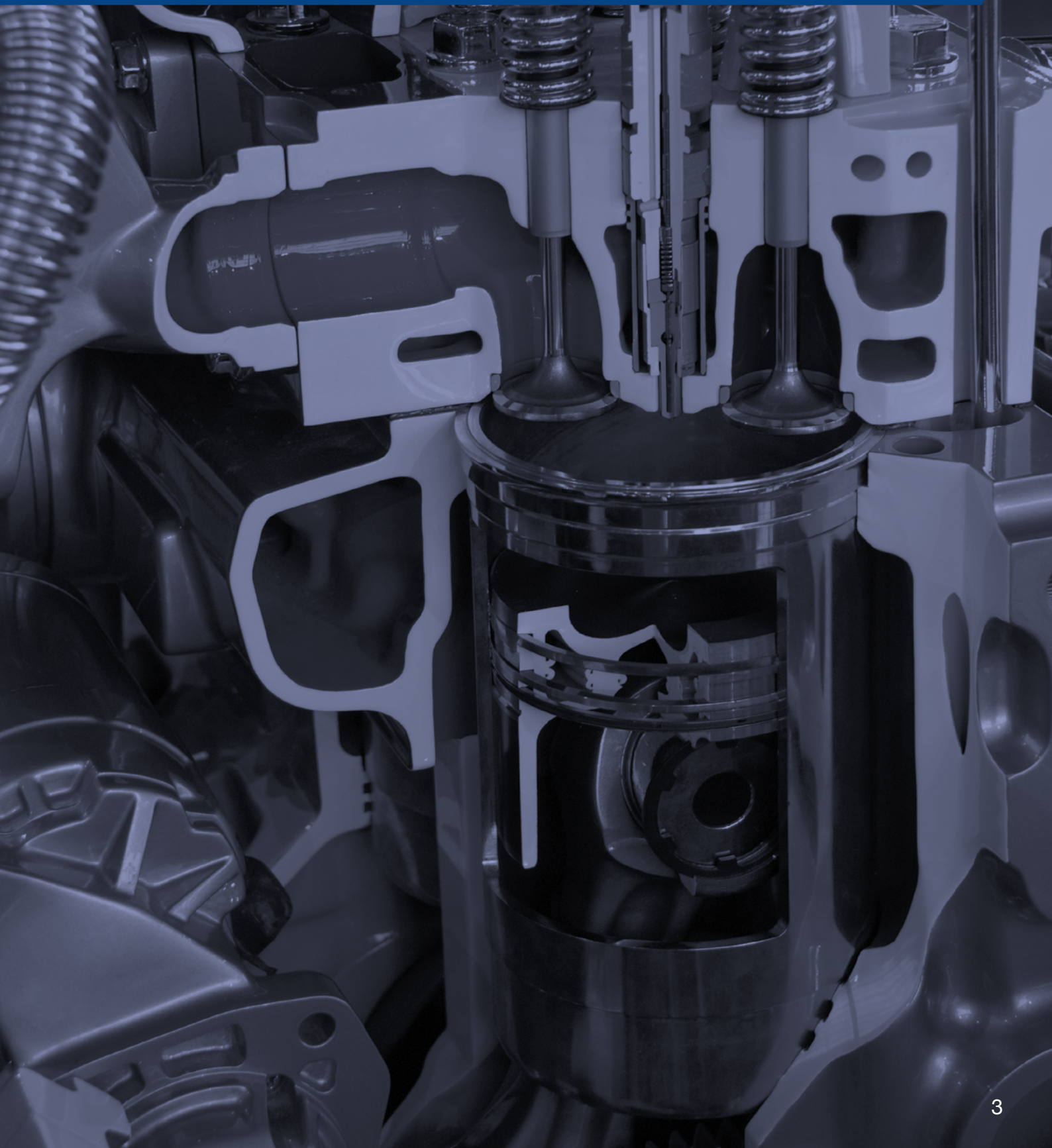
Introduction	6
Training Center Overview	6
Course Description	7
Kubota Series	8
John Deere Series	10
Cummin Series	12
Installations & Applications	16

Non-Engine Training Courses

Engine-Related Training Courses	19
Alternator Training Courses	20
Genset Control Training Courses	21
Hybrid / Solar Training Courses	22
Sales Training Courses	23
Training logistics	24
General Conditions for enrolment	24
Registration Form	25



ENGINE TRAINING COURSES





Introduction

Ghaddar Machinery Co. is a multi-territorial Appointed Distributor for Kubota and John Deere engines and Leroy Somer alternators and Authorized Cummins G-Drive engines GOEM. The company focuses on the distribution of Engines and their applications, in addition to spare parts and Service.

Ghaddar Machinery Co. builds on a 40 years' experience in distribution, marketing and technical support of engines in the sectors of Electrical Power and Industrial applications.



JOHN DEERE

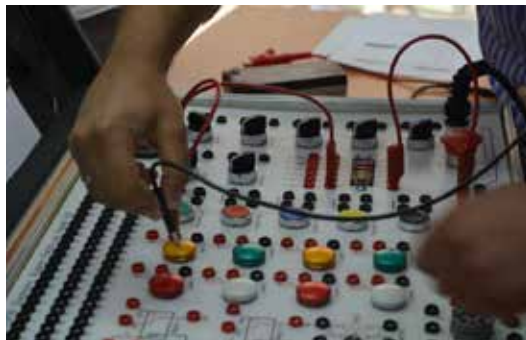
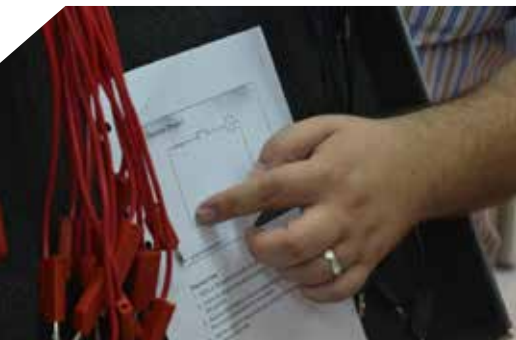


LEROY-SOMER™

Training Center Overview

Ghaddar Machinery Co. Trainers are all Certified and they enjoy a strong experience in training and technical capability that proved successful to many trainees and their companies by adding a lot to their experience in troubleshooting and repairing these engines.

Ghaddar Machinery Co. training Center offers the ultimate environment for effective training. It makes available for the trainees a wide range of training equipment and constantly updated course material specially prepared to suit their specific training needs.



Course Description

Title	Duration	Pre-requisite
KUBOTA 05 & 03 Series	1 day	
KUBOTA V3 Series	1 day	
JOHN DEERE PowerTech M	1 day	
JOHN DEERE PowerTech E	1 day	Electronically Controlled Engines
Cummins QSX15 (CM570)	2 days	Electronically Controlled Engines
Cummins QSK23 (CM500)	2 days	Electronically Controlled Engines
Cummins QST30 (Genset)	2 days	Electronically Controlled Engines
Cummins KTA19/38/50	2 days	
Installation & Application Kubota & John Deere Powered Genset	1 day	
Installation & Application Cummins Powered Genset	1day	

Program

- 1- Welcome Note & Acquaintance
- 2- Agenda & Domestic
- 3- Course objective
- 4- Brief Description for the Company
- 5- Various generator ranges
- 6- Theoretical sessions
- 7- Practical implementation
- 8- Evaluation of acquired knowledge
- 9- Evaluation of the training Course

KUBOTA 05 & 03 Series

Course Overview

An instructor-Led training course, with engine dismantling and assembly. It is designed to give an insight into the features and mechanical aspects of Kubota mechanical engines (05 & 03 series) that are used for power generation. The course is aimed at those within a technical role of engines. Fresh mechanical engineers and technicians can attend the course.



Pre-requisite

Persons with a sound diesel engine background, wishing to attain knowledge of KUBOTA engines models 05 & 03, Mechanical range.



Course Objectives

- The course aim is to provide an excellent understanding of Kubota mechanical engines (05 & 03 series).

At the end of the course the delegates will be able to:

- Understand Kubota Mechanical range
- Understand engine model and serial number
- FABs: Features, Advantages and Benefits.
- Use information in Kubota Manuals
- Dismantle and re-assemble the engine
- Fuel pump settings
- Understand engine service requirements
- Technical presentation
- Use of Kubota manual
- Engine service bulletins

Target Engines	Course Duration	Course Location
Mechanical range of 05 & 03 Series	1 Day	Our Training facility in Lebanon

KUBOTA V3 Series

Course Overview

An instructor-Led training course, with engine dismantling and assembly. It is designed to give an insight into the features and mechanical aspects of Kubota mechanical engines (V3 series) that are used for power generation. The course is aimed at those within a technical role of engines. Fresh mechanical engineers and technicians can attend the course.



Pre-requisite

Persons with a sound diesel engine background, wishing to attain knowledge of KUBOTA engines V3 series, Mechanical range.



Course Objectives

- The course aim is to provide an excellent understanding of Kubota mechanical engines (V3 series).

At the end of the course the delegates will be able to:

- Understand Kubota Mechanical range
- Understand engine model and serial number
- FABs: Features, Advantages and Benefits.
- Use information in Kubota Manuals
- Dismantle and re-assemble the engine
- Fuel pump settings
- Understand engine service requirements
- Technical presentation
- Use of Kubota manual
- Engine service bulletins
- E-Gov installation

Target Engines

Course Duration

Course Location

Mechanical range of
V3 Series

1 Day

Our Training facility in Lebanon

JOHN DEERE PowerTech M

Course Overview

An instructor-Led training course, with engine dismantling and assembly. It is designed to give an insight into the features and mechanical aspects of John Deere mechanical engines that are used for power generation. The course is aimed at those within a technical role of engines. Fresh mechanical engineers and technicians can attend the course.



Pre-requisite

Persons with a sound diesel engine background, wishing to attain knowledge of John Deere PowerTech M, Mechanical range.

▶ Course Objectives

- The course aim is to provide an excellent understanding of John Deere PowerTech M, Mechanical range.

At the end of the course the delegates will be able to:

- Understand Powertech M range: 2.9L, 4.5L & 6.8L
- Understand engine model and serial number
- FABs: Features, Advantages and Benefits.
- Use information in John Deere Manuals
- Dismantle and re-assemble the engine
- Understand engine service requirements
- Technical presentation
- Use of CTM manual
- Engine service bulletins
- Understand PowerAssist mobile application

Target Engines	Course Duration	Course Location
Mechanical range of 2.9L, 4.5L & 6.8L	1 Day	Our Training facility in Lebanon

JOHN DEERE PowerTech E

Course Overview

An instructor-Led training course, with engine dismantling and assembly. It is designed to give an insight into the features and Electronic aspects of John Deere mechanical engines that are used for power generation. The course is aimed at those within a technical role of engines. Fresh mechanical engineers and technicians can attend the course.



Pre-requisite

Persons with a sound diesel engine background, besides to using laptop software, electrical wiring schematic and using multi-meter tool.



Course Objectives

- The course aim is to provide an excellent understanding of John Deere PowerTech E, Electronic range.

At the end of the course the delegates will be able to:

- Understand Powertech E range: 6068 & 6090
- Understand engine model and serial number
- FABs: Features, Advantages and Benefits.
- Use information in John Deere Manual
- Understand engine ECU wiring: Engine Side
- Understand engine ECU wiring: OEM Side
- Use multi-meter for trouble-shooting
- Understand DTC to diagnose faults
- ECU connections with Genset Controllers
- Understand PowerAssist mobile application
- Usage of Service advisor software in engine service

Target Engines

Electronic range of
6.8L & 9.0L

Course Duration

1 Day

Course Location

Our Training facility in Lebanon

Cummins QSX15 (CM570)

Course Overview

An instructor-Led training course, with engine dismantling and assembly. It is designed to give an insight into the features and Electronic aspects of Cummins QSX15 that is equipped with HPITP injectors and controlled by CM570 ECU, that is applied in power generation.



Pre-requisite

“Cummins electronic engines and Insite software” course is needed to attend QSX15 (CM570) training course.



Course Objectives

- The course aim is to provide an excellent understanding of Cummins G-Drive engine, QSX15 (CM570).

At the end of the course the delegates will be able to:

- Understand Cummins range
- Understand engine circuits: Cooling, induction, fuel and lubrication
- Engine FABs: Features, Advantages and Benefits.
- Use information in Cummins related Manual
- Understand engine ECU wiring: Engine Side
- Understand engine ECU wiring: OEM Side
- Use multi-meter for trouble-shooting
- Understand DTC to diagnose faults
- ECU connections with Genset Controllers
- Understand Quickserve mobile application
- Usage of INSITE software tool in engine service

Target Engines	Course Duration	Course Location
Cummins G-Drive QSX15 (CM570)	2 Days	Our Training facility in Lebanon

Cummins QSK23 (CM500)

Course Overview

This course will allow participants to recognize the QSK23 engines, their components flow paths and operation procedures. Use of the correct rebuild procedures with reference to the QSK23 Manuals. Outline the QSK23 operation and maintenance schedules. A Thorough understanding of the HPI Fuel system. Use of the INSITE software tool.



Pre-requisite

“Cummins electronic engines and Insite software” course is needed to attend QSK23 (CM500) training course.

▶ Course Objectives

- The course aim is to provide an excellent understanding of Cummins G-Drive engine, QST30 (Genset)

At the end of the course the delegates will be able to:

- Understand Cummins range
- Understand engine circuits: Cooling, induction, fuel and lubrication
- Engine FABs: Features, Advantages and Benefits.
- Use information in Cummins related Manual
- Understand engine ECU wiring: Engine Side
- Understand engine ECU wiring: OEM Side
- Use multi-meter for trouble-shooting
- Understand DTC to diagnose faults
- ECU connections with Genset Controllers
- Understand Quickserve mobile application
- Usage of INSITE software in engine service

Target Engines	Course Duration	Course Location
Cummins G-Drive QST30 Genset	2 Days	Our Training facility in Lebanon

Cummins QST30 (Genset)

Course Overview

This course will ensure participants have a good working knowledge of the structure and operation of the QST30 engine and its components. Emphasis will be placed on the fuel system and the the electronic management system. Once qualified the participants will be able to confidently troubleshoot the mechanical and electronic QST30 systems using the INSITE diagnostic tool.



Pre-requisite

“Cummins electronic engines and Insite software” course is needed to attend QST30 training course.



Course Objectives

The course aim is to provide an excellent understanding of Cummins G-Drive engine, QST30 (Genset)

At the end of the course the delegates will be able to:

- Understand Cummins range
- Understand engine circuits: Cooling, induction, fuel and lubrication
- Engine FABs: Features, Advantages and Benefits.
- Use information in Cummins related Manual
- Understand engine ECU wiring: Engine Side
- Understand engine ECU wiring: OEM Side
- Use multi-meter for trouble-shooting
- Understand DTC to diagnose faults
- ECU connections with Genset Controllers
- Understand Quickserve mobile application
- Usage of INSITE software in engine service

Target Engines	Course Duration	Course Location
Cummins G-Drive QST30 Genset	2 Days	Our Training facility in Lebanon

Cummins KTA19/38/50

Course Overview

This course will ensure participants are able to recognise the K19/38/50 engine, its components, system flow paths, operation procedures, correct rebuild practices with reference to the shop manual and attention to the correct troubleshooting, repair and maintenance procedures.



Pre-requisite

External customers, experienced technicians and technicians with little experience in diesel engines, technicians with experience on other engines and new to Cummins



Course Objectives

- The participants at the end of the training will be able to confidently identify all aspects of the K19/38/50 engine, including engine systems, engine rebuild procedures according to QSOL and the PT fuel system.

At the end of the course the delegates will be able to understand:

- Cummins G_drive range of engines
- Engine Systems, Features and components
- Engine Teardown including, cylinder head and top set, piston and liner and timing case and gear train R & R.
- PT fuel system, injector cam timing and fuel pump and injector R&R
- Fault finding and diagnostic
- FABs: Features, Advantages and Benefits.
- Use information in QSOL to build the engine
- Dismantle and re-assemble the engine
- Understand engine service requirements
- Technical presentation

Target Engines	Course Duration	Course Location
Cummins KTA19/38/50	2 Days	Our Training facility in Lebanon

Installation & Application Kubota & John Deere Powered Genset

Course Overview

This course will ensure participants are able to recognise the requirements of Diesel generating sets to be installed properly as per manufacturer recommendations and stipulations. It will assist the operator to select the proper consumables as Fuel, lubricants and coolants. It provides solutions for special applications as installation on roof, or when ambient temp is very low and others.



Pre-requisite

This course is suitable for anybody that will work or deal with Diesel generating sets, just needs minimum knowledge about diesel engines.



Course Objectives

The participants at the end of the training will be able to confidently identify the application requirements of all GHADDAR Kubota and John Deere powered gensets, including fuel tanks & plumping, ventilations and induction, exhaust system and other engine systems.

At the end of the course the delegates will be able to understand:

- The suitable mounting system
- Fuel specs, fuel tanks and fuel plumping.
- Coolant selection and recommendations
- Lubricating oil system
- Ventilation requirements
- Exhaust system installation and
- Special installation
- Genset accessories and their installation
- Technical presentation

Target Engines	Course Duration	Course Location
Application Course Kubota & John Deere	1 Day	Our Training facility in Lebanon

Installation & Application Cummins Powered Genset

Course Overview

This course will ensure participants are able to recognise the requirements of Diesel generating sets to be installed properly as per manufacturer recommendations and stipulations. It will assist the operator to select the proper consumables as Fuel, lubricants and coolants. It provides solutions for special applications as installation on roof, or when ambient temp is very low and others.



Pre-requisite

This course is suitable for anybody that will work or deal with Diesel generating sets, just needs min knowledge about diesel engines.



Course Objectives

The participants at the end of the training will be able to confidently identify the application requirements of all GHADDAR Cummins powered gensets, including fuel tanks & plumping, ventilations and induction, exhaust system and other engine systems.

At the end of the course the delegates will be able to understand:

- The suitable mounting system
- Fuel specs, fuel tanks and fuel plumping.
- Coolant selection and recommendations
- Lubricating oil system
- Ventilation requirements
- Exhaust system installation and
- Special installation
- Genset accessories and their installation
- Technical presentation

Target Engines	Course Duration	Course Location
Application Course Cummins G-Drive	1 Day	Our Training facility in Lebanon

A large, multi-story building with a grid-like facade and a landscaped pond with a fountain in the foreground. The building has many windows and balconies. The pond is in the foreground, with a fountain spraying water. There are trees and bushes around the pond. The overall scene is in a sepia or brownish tone.

NON-ENGINE TRAINING COURSES

Engine Related Training Courses

Code	Course Name	Trainer	Language	Duration	
TE1	Installation of Diesel Generating sets	M. Shaat	English/Arabic	1 Day	This course covers all general requirements to install generating sets, this includes mounting, vibration, Cooling, fuel, Lube oil, ventilation, noise, exhaust and others.
TE2	Delphi DP Fuel Injection pump	O. Ghaddar	English/Arabic	1/2 Day	This course covers the dismantling, assembly and service Delphi DP fuel injection pump that is fitted to John Deere 3029 & 4045 series and Perkins 1100 Mech engines.
TE3	PM program (customer to specify the target engines)	O. Ghaddar	English/Arabic	1 Day	This course delivers the practical experience to achieve the routine maintenance of engine as stipulated and recommended by engine manufacturers.



Alternator Training Courses

Code	Course Name	Trainer	Language	Duration	Description
TA1	Leroy Somer Alternator Excitation Systems & AVRs	M. Shaat	English/Arabic	1/2 Day	This course covers all types of Leroy Somer excitation systems with related AVRs, along with needed routine service.
TA2	Alternator PM	M. Shaat	English/Arabic	1/2 Day	This course delivers the practical experience to achieve the routine maintenance of alternator as stipulated and recommended by LS.
TA3	TAL Range	M. Shaat	English/Arabic	1/2 Day	This course delivers the details of new range, types, AVRs, advantages, standard and optional scope.
TA4	Alternator troubleshooting	M. Shaat	English/Arabic	1 Day	This course covers all techniques and methodologies to diagnose alternator electrical and mechanical faults.
TA5	Alternator Selection	M. Shaat	English/Arabic	1 Day	This course covers all requirements to select alternator for all kind of applications, this includes big starting, transformer, pump, harmonics, UPS, enclosure IP, single/double bearings, parallel operation and others.
TA6	Medium Voltage Alternator	M. Shaat	English/Arabic	1 Day	This course covers all requirements to select and install Medium voltage alternators, including coupling type, bearing types, cooling, temperature protection, VTs, CTs and Earthing.



Genset Control Training Courses

Code	Course Name	Trainer	Language	Duration	Description
TC1	DEESEA Controller (depending on customer request) DSE6xxx, DSE7xxx	M. Shaat	English/Arabic	1 Day	This course covers overview of all DSE controllers, with focus on tech specs, wiring and programming of gensets controlled by a specified DSE controllers (DSE6xxx or DSE7xxx).
TC2	DSE configuration suite software	M. Shaat	English/Arabic	1 Day	This course covers connection and programming of DSE controllers using DSE config suite (customer needs to specify DSE6xxx or DSE7xxx).
TC3	Remote monitoring of DSE Controllers SCADA+ WEBNET+GSM	M. Shaat	English/Arabic	1 Day	This course covers the different methods to monitor DSE controllers remotely, using DSE SACAD System through DSE8005, DSE8003, DSE890/1 or GSM modems.
TC4	Parallel Operation of Diesel Gensets (based on DSE8xxx)	M. Shaat	English/Arabic	2 Days	This course covers basic requirements of synchronizing and load sharing gensets, this includes between gensets and also with Mains. The course covers how to implement the rules using DSE8xxx controllers. Some special applications will be discussed.
TC5	Parallel Operation of Diesel Gensets (based on Woodward EGCP controller)	M. Shaat	English/Arabic	2 Days	This course covers basic requirements of synchronizing and load sharing gensets, this includes between gensets and also with Mains. The course covers how to implement the rules using Woodward EGPG controller.
TC6	ComAp GMP203-C	M. Shaat	English/Arabic	1 Day	This course covers tech specs, wiring and programming of gensets controlled by ComAp controllers (namely ComAp IL-NT).
TC7	Electrical Wiring troubleshooting	M. Shaat	English/Arabic	1 Day	This course delivers skills as building electric circuit, understand wiring diagram, evaluate wiring quality and troubleshoot electrical faults.
TC8	Power Cable selection	M. Shaat	English/Arabic	1/2 Day	This course covers selection of power cables according to tech specs, installation and electrical requirements.

Hybrid / Solar Training Courses

Code	Course Name	Trainer	Language	Duration	Description
TH1	PV-Diesel-Grid Solution (On Grid)	M. Shaat	English/Arabic	1 Day	This course covers the basics of solar PV power for residential and industrial applications, and needed data to design profitable solution.
TH2	Hybrid DC VSG Solution for Telecom application VSG: Variable Speed Genset	M. Shaat	English/Arabic	1 Day	This course covers the basics and benefits of various types of DC Hybrid solution for telecom applications. It covers also the expected revenue of Hybrid solution with Solar power.



Sales Training Courses

Code	Course Name	Trainer	Language	Duration	Description
TS1	Genset Sizing	M. Shaat	English/Arabic	1 Day	This course covers basics of gensets, Prime – Standby – Baseload ratings Meaning of KVA-KW-KVAR and PF Handling special cases: Pump, transformer, UPS, LE Lighting.
TS2	Kubota Range	M. Shaat	English/Arabic	1/2 Hour	This course covers the huge capability of Kubota range, for all types of diesel and gas engines, with different ignition systems. This besides to engine advantages
TS3	GHADDAR "Kubota powered" gensets for Telecom application	M. Shaat	English/Arabic	1/2 Hour	This course covers advantages of applying Kubota powered gensets in Telecom application.
TS4	John Deere Range	M. Shaat	English/Arabic	1/2 Hour	This course covers the great capability of John Deere range, for all types of diesel engines.
TS5	Cummins Range	M. Shaat	English/Arabic	1/2 Hour	This course covers the great capability of Cummins range, and their application in different markets

Kubota  **JOHN DEERE**

POWERED BY
Cummins
G-DRIVE

LEROY-SOMER™





Training Logistics

- Number of participants: 4 to 8 trainees.
- Customized collection of courses can be done for at least 5 trainees (Pre-requisites and durations are fixed)
- Training fee will include besides to training course, issuance of certificate, training literature, usage of training equipment in addition to lunch meal & refreshers. It excludes charges for visa, tickets, hotel, transportation, medications and others.
- CD containing Presentation Material (Optional).
- Payment should be settled upon receipt of invoice
- Our secretarial services can be put at your disposal to help you book Hotel rooms, however, accommodation and transportation charges remain at the expense of the participants.

General Conditions for Enrolment

How to Register

Please send your enquiry by mail or by Fax.

Phone: +961 (0) 7 220 000

Fax: + 961(0) 7 223 322

e-mail: mshaat@ghaddar.com

Cancellation of registration

Any cancellation must be notified at least 14 days prior to the start of the course. Ghaddar Machinery Co. Training reserves the right to cancel or reschedule the course in case of "Force Majeur" or any reason that is out of our control.

Practical information

Upon registration, an agreement and a training program will be sent. Registration will be confirmed upon receipt of the training agreement signed. An attendance certificate will be attached to the invoice

Training Venue

Training is given at Ghaddar Machinery Co. training facility in Ghaddar Machinery Co. Head office- Sidon-Lebanon.



Registration Form

Company

Training Booked By:

E-mail:

Name:

Title:

Telephone Number*:

Fax No :

Organization Name:

Course Details

Prerequisites must be met prior to enrolment on product specific courses. This enrolment request will be declined if prerequisites have not been completed.

Course*:

Course Dates (week beginning):

Delegate Information

Delegate 1*:

Delegate 2:

Delegate 3:

Delegate 4:

Budget and Acceptance

Ghaddar Machinery Co. assumes no responsibility for any costs incurred for accommodation and sustenance. All hotel costs are to be settled by the delegate prior to departure.

Name & Signature

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Please send your enquiry by mail or by Fax.
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