

**DEVELOPING YOUR OWN SERVICE TECHNICIANS**  
**STEP GRADE SYSTEM FOR TRAINING**

**TECHNICIAN TRAINEE – Mechanic “C”**

**STEP 1**

**A: QUALIFICATIONS:**

- (1) Neat appearance.
- (2) Comply with entry skill levels assessment to determine existing knowledge.
- (3) Have mechanical aptitude. Background of mechanical training in high school, community trade schools is helpful or just has the desire to learn to be a technician.
- (4) Stable previous employment or school record.
- (5) Trainee to furnish basic tools (the dealer should consider offering an optional \$3000 basic tool set with payroll deduction plan). Note: Should trainee leave before paying for tools, he must return them or pay balance for complete set.

**B: ORIENTATION:**

**Week One (To be facilitated by Service Manager – forms to be completed)**

- (1) **Safety:** Review hazards of job, required equipment, location of safety equipment, and where, how, and when to report accidents. (You are the most important safety factor in your job.)
- (2) **Time Cards:** Review how to obtain and complete accurately.
- (3) **Work habits/Ethics:** To have successfully completed a course explaining company policies and procedures as per employee handbook.

**Week Two (To be facilitated by Service Manager – forms to be completed)**

- (1) **Service Reports:** Introduce and explain basic purpose showing examples of requirement, appropriate questions to be answered and importance of accuracy, clarity, and prompt completion.

- (2) **Product Line:** Review all lines covered by the dealer or that particular branch.
- (3) **Parts System:** Review where to find parts sources, how and where to place parts orders, what form to use.
- (4) **Literature Introduction:** Review location and availability of all parts and service literature. (Ref. Basic Training Materials Study Guide Class).

**Week Three (At the discretion of the Service Managers approval)**

- (1) **Safety OSHA/MSHA:** To successfully complete a course on operator training and development in identifying and complying with MSHA and OSHA regulations. This is including all aspects of safety and should cover equipment operation, lifting and blocking, fire and hazardous materials and shop equipment.

**C: RESPONSIBILITIES:**

- (1) Have a good attitude, conduct and cooperation with employees and customers.
- (2) Trainee will receive training and follow instructions from shop and field lead technicians, training director, shop foreman, and service manager
- (3) Must successfully complete basic courses and demonstrate the ability to perform these tasks either in the shop or the field as the need arises.
- (4) Keep a neat and orderly work area for safe and efficient performance.
- (5) Be prepared for formal job evaluation (by the direct supervisor) at the end of ninety days to determine status of trainee if he should be terminated or qualified for change to class C shop technician.

**D: METHOD OF MEASUREMENT:**

- (1) Successful completion of basic courses.
- (2) Satisfaction of employees and customers with trainees work quality
- (3) Performance of responsibility as set forth in A and B above.
- (4) Quality of performance, attitude, loyalty, efficiency, and adherence to safety practices.
- (5) Tools to perform job increasing.

## MECHANIC “C”

### STEP 2

- (1) **Base Product Line:** Course on Base Product Lines, explaining the nomenclatures and the applications for, relevant to the constructions division.
- (2) **Basic R&I** (including attachments): To demonstrate the ability to remove and install the basic components and attachments and/or know where to find instructions and implement them in a safe and timely manner.
- (3) **PM and Pre-Delivery Inspections:** To demonstrate the ability to completely inspect, identify, and document repairs needed on a machine through routine maintenance inspections as outlined by an appropriate PM/PDI form.
- (4) **Perform PM Services:** Demonstrate the ability to perform Level One PM's.
- (5) **Customer Satisfaction Skills:** To have successfully completed the Customer Satisfaction Skills Course and to demonstrate the principals in everyday applications with inner company personnel and external customers.
- (6) **Measuring Tools:** To have successfully completed the course (and/or post test) this will cover: micrometers, dial indicators, calipers, dial bore gages, etc.
- (7) **Undercarriage:** To have successfully completed the course (and/or post test) which covers all components of the undercarriage system, information on adjustments and maintenance, and proper corrective action for diagnostic problems, demonstrations of this knowledge and use of Komatsu Service Manuals will be seen in job performance on an “as needs” basis.

### STEP 3

- (1) **Product Line Expanded:** To have successfully completed a course (and/or post test) on specific product lines and attachments explaining nomenclature and applications.
- (2) **Logical Troubleshooting:** To have successfully completed a course (and or posttest) and demonstrate the ability to choose and apply troubleshooting procedures in identifying symptoms and determining the true root cause of the problem in a logical organized approach.

- (3) **Basic Electricity:** To have completed the Volvo basic electrical course.
- (4) **Basic Hydraulics:** To have successfully completed the basic interactive Volvo course and demonstrate the ability to identify basic parts of the system, fundamentals of operation, and identify potential safety hazards in working with hydraulics.
- (5) **Hydraulic Cylinder Reconditioning:** To be able to and knowledgeable of reconditioning procedures and tooling used in repairing hydraulic cylinders. To include knowledge of oversized rod and tubes and seal kits, and related reference materials.

#### **STEP 4**

- (1) **Engines I :** To have successfully completed the Volvo course and demonstrate the ability to identify and describe engine type, components, and interrelated systems.
- (2) **Failure Analysis I:** To have successfully completed the course which covers the proper management of an F/A investigation, visual inspection techniques, metallurgy, principles of fracture and wear and threaded fasteners? Demonstration of this process should be seen in everyday work performance.
- (3) **Basic Fuel Systems:** To have successfully completed a course (and/or post test) and demonstrate the ability to identify, perform basic system diagnostic test, make minor adjustments, and remove, install, and time.
- (4) **Computer Introduction:** To demonstrate the ability to check in-house parts availability and work order inquiry functions on the EUR mainframe system.
- (5) **Cooling Systems I:** To have successfully completed a study course and demonstrate the ability to identify associated components, systems, operations, and proper fluid and additives.

#### **STEP 5**

- (1) **Basic Power train:** To have successfully completed the course (and/or post test) and demonstrate a working knowledge of basic power train types by identification and description of methods of operation.

- (2) **Advanced Literature:** To have successfully completed the course (and/or post test) and demonstrate the ability to utilize all available literature resources. This includes parts and service bulletins, etc.
- (3) **Specialized Equipment:** To demonstrate the ability to utilize equipment required performing normal duties in a safe and proper manner (equipment/tools not covered by other specific training, i.e., in shop oil supply).
- (4) **Power shift Transmission I:** To have successfully completed the course (and/or post test) and demonstrate the ability to retrieve diagnostic information from appropriate service manuals, locate and record necessary pressure readings for performance testing and/or diagnostic trouble shooting.

## **MECHANIC “B”**

**STEP 1**      Mechanic C – Steps 1-3:

**STEP 2**      Mechanic C – Steps 3-5:

**STEP 3**      Choose Electives from Systems and Components List (see below)

2 Systems  
2 Components

**STEP 4**      Choose Electives from Systems and Components List (see below)

2 Systems  
2 Components

**STEP 5**      Choose Electives from Systems and Components List (see below)

1 System  
1 Component

**Failure Analysis II:** To have successfully completed the course which covers a review of F/A I, applying principles of failure analysis on connection rods, camshafts and bearings, pistons, rings, liners, engine valves, and turbo chargers.

## ELECTIVE TOPICS FOR MECHANIC "B" DEFINED

### SYSTEMS

- (1) **Fuel System:** To have completed the level II course (and/or post test) and demonstrate the knowledge of injection pump operation, governor operation and adjustments, and diagnostic procedures.
- (2) **Air Induction:** To have completed the level II course (and/or posttest) on Engine Diagnostics and demonstrate the knowledge of intake & exhaust systems as well as all related components, (turbochargers, after coolers, emission control, and pre-cleaners).
- (3) **Lubrication System:** To have completed the level II Course (and/or posttest) on Engine Diagnostics and demonstrate the knowledge of lube systems operation as well as all related components, (pumps, by-pass valves, coolers, filtration devices).
- (4) **Cooling System:** To have completed the level II course (and/or post test) on Engine Diagnostics and demonstrate the knowledge of cooling systems operation, components, and complete diagnostic testing.
- (5) **Electricity II:** To have completed the Volvo advanced course and demonstrate the skills learned by successfully trouble shooting most any machine electrical problem.
- (6) **Electronic Monitoring Systems:** To have successfully completed the course on EMS this covers the system operation and diagnostic troubleshooting. To be able to correctly diagnose problems on EMS and successfully repair.

**Hydraulic System Types:** To have completed Volvo advanced trouble shooting technicians should be able to distinguish the correct type of system to enhance troubleshooting abilities.

## ELECTIVE TOPICS FOR MECHANIC "B" DEFINED

### COMPONENTS

- (1) **Engines II:** To have completed the level II course on Engine Diagnostics and demonstrate and describe all operating principles of all types of engines used in construction equipment.

- (2) **Torque Converters:** To have completed the level II course on Fluid Couplers and Devices (and/or post test) and demonstrate by identifying types, function, principles of operation, and internal components.
- (3) **Power shift Transmission:** To have completed the level II course on Power shift Transmissions (and/or post test) and demonstrate by describing systems operation, performance testing and adjusting, and diagnostic trouble shooting.
- (4) **Steering Clutches & Final Drives:** To have completed the course (and/or post test) and demonstrate skills by performing required service work on all types of clutches and configurations of final drives.
- (5) **Hydraulic Pumps & Motors:** To have completed the Volvo advanced course (pumps and motors lessons) and demonstrate by identifying and describing types of pumps and motors, the operation of each type, and diagnostic testing for problem solving on each type.
- (6) **Hydraulic Valves:** To have completed the manufacturer's advanced (valve lessons) and demonstrate by identifying and describing function of the different types of valves, and testing and adjusting.
- (7) **Electronic/Hydraulic Controllers:** To have completed the course (and/or posttest) and demonstrate by describing how controllers improve machine operations, locate all components, perform calibration procedures, and use on-board diagnostics.

### **MECHANIC "A"/SHOP & FIELD SERVICE**

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| <b><u>STEP 1</u></b> | Mechanic B - Steps 1-3   |
| <b><u>STEP 2</u></b> | Mechanic B - Steps 3-5   |
| <b><u>STEP 3</u></b> | 4 Family Electives – Choose Family Electives (see Family list) |
| <b><u>STEP 4</u></b> | 4 Family Electives – Choose Family Electives (see Family list) |
| <b><u>STEP 5</u></b> | 3 Family Electives – Choose Family Electives (see Family list) |

**Failure Analysis III:** To have completed the course topics: lubricants, pumps and motors, anti-friction bearings, gears, and shafts, and demonstrate the use of good failure analysis habits in everyday work.

## **MECHANIC “A+”/ SHOP & FIELD SERVICE/LEADMAN**

- STEP 1**      Mechanic A – Steps 1-3
- STEP 2**      Mechanic A – Steps 3-5
- STEP 3**      4 Family Electives – Choose Family Electives (see Family  
list)
- STEP 4**      4 Family Electives – Choose Family Electives (see Family  
list)
- STEP 5**      3 Family Electives – Choose Family Electives (see Family  
list)

**Presentation Skills Course:** To have completed a course on Team Training or Presentation Skills and demonstrate those skills by successfully conducting Team Training on an “as needed” basis.

## **MASTER TECHNICIAN**

- STEP 1**      Mechanic A+ - Steps 1-3
- STEP 2**      Mechanic A+ - Steps 3-5
- STEP 3**      2 Product Line Mastery – Choose Product Line Elective (see  
Mastery List)
- STEP 4**      2 Product Line Mastery – Choose Product Line Elective (see  
Mastery List)
- STEP 5**      2 Product Line Mastery – Choose Product Line Elective (see  
Mastery List)
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**ELECTIVE FAMILY TOPICS DEFINED FOR:**

**MECHANIC "A"/SHOP & FIELD SERVICE  
MECHANIC "A+"/SHOP & FIELD SERVICE  
LEADMAN  
MASTER TECHNICIAN**

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Family courses cover introduction to the specifics of the product, nomenclature and terminology, component identification and location, knowledge of systems operation, performance testing and adjusting procedures, and diagnostic troubleshooting procedures and processes. Also includes any product updates and model improvements as well as service letters and case histories. Upon completion technicians should be able to demonstrate skills learned by successfully completing job assignments in a timely manner with a minimum amount of rework.

**ALL ENGINES THAT THE DEALER REPRESENTS**

<b>ELECTIVE FAMILY TOPICS - Continued</b>
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**TRANSMISSIONS**

Wheel Loaders  
Motor Graders  
Articulated Dump Trucks  
Countershaft Type (with electronic controls)  
Auto shift Types

**HYDRAULICS**

Wheel Loaders  
Backhoe Loaders  
Excavators  
Motor Graders  
Paving Products  
Compactors  
Articulated Dump Trucks

**AIR CONDITIONING:** To have completed the course and post test covering: principles of operation, servicing procedures, all levels of diagnostics, on both R12 and R134A. Demonstration of skills learned will be observed in lab exercises before shop work is allowed. New tooling requirements and E.P.A. regulations will be learned. Air Conditioning Certification will be included as part of this required training.

<b>ELECTIVE PRODUCT LINE MASTER TOPICS DEFINED FOR MASTER TECHNICIAN</b>
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**Requirements for the Master Technician are:**

- A. The candidate will have completed all courses pertaining to the area of his mastery (and/or post tested at 90% or greater).
- B. The candidate will have demonstrated his mastery by successfully diagnosing and repairing any and all problems on all model sizes of machines within his mastery field.
- C. The candidate has been trained to Team Teach and has satisfied both his supervisor and the responsible training instructor of his ability to successfully teach any requested portion of his mastery to other team members by doing so.
- D. The candidate will demonstrate his mastery by completing his job assignments on the subject product line within job standard times.
- E. The candidate as a Master will be expected to maintain current with changes in the line, including the introduction of new models, by regular communication with the Technical Communicator.