



VEHICLE SERVICING AND REPAIRING

BASED ON
ETHIOPIAN OCCUPATIONAL STANDARD
(EOS)

Learning Guide -26

Unit of Competence: -Remove, Disassemble and Install
Vehicle System Assemblies

Module Title: -Removing, Disassembling and Installing Vehicle
System Assemblies

LG Code: EIS VSR2 M07 0919 LON-LG-26

TTLM Code: EIS VSR2 TTLM 0919v1

LO5: Clean-up work area and maintain equipment



This learning guide is developed to provide you the necessary information regarding the following content coverage and topics –

- Prepare for work
- Remove system assemblies and maintain equipment
- Disassemble system assemblies
- Replace/reassemble
- Clean-up work area

This guide will also assist you to attain the learning outcome stated in the cover page.

Specifically, upon completion of this Learning Guide, you will be able to –

- ✓ Collect and store material that can be reused
- ✓ Remove waste and scrap following workplace procedures
- ✓ Clean and inspect equipment and work area
- ✓ Identify faults and tag unserviceable equipment
- ✓ Complete operator maintenance in accordance with manufacturer/component supplier specifications and site Procedures
- ✓ Maintain tool and equipment in accordance with workplace procedures

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 3 to 20.
3. Read the information written in the “Information Sheets 1”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
4. Accomplish the “Self-check 1” in page -.
5. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 1).
6. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.
7. Submit your accomplished Self-check. This will form part of your training portfolio.



1.1. Collect and store reused material.

Automotive recycling industry is continuously implementing creative ways to reuse components, reduce waste and increase recycling rates from the process of manufacturing

Separating wastes allows for easier recycling and may reduce disposal costs. Keep hazardous wastes separate, do not mix used oil solvents, and keep chlorinated solvents (like, -tricolor ethane) separate from non-chlorinated solvents (like kerosene and mineral spirits).

Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around. Provide cover and secondary containment until these materials can be removed from the site. Oil filters can be recycled. Ask your oil supplier or recycler about recycling oil filters. Do not dispose of extra paints and coatings by dumping liquid onto the ground or throwing it into dumpsters. Allow coatings to dry or harden before disposal into covered dumpsters. Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries, even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking. Vehicles are through their end-of-life recycling.



Self-Check -1	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next

Page:-

1. How can we collect and store material that can be reused in automotive industry?



Information Sheet 2	Remove waste and scrap
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2.1. Recycling

Auto recyclers remove parts such as engines, transmissions, doors and bumpers for reuse in other vehicles. Other parts that can also be remanufactured include starters, alternators and water pumps. Batteries, catalytic converters, tires and some plastics are removed and their materials are recycled into new products. Fluids such as engine oil, coolant, and gasoline are carefully managed to prevent releases by storing them in double-walled tanks and/or secondary containment prior to being reused or recycled.

The automotive recycling industry also saves energy, conserves natural resources, reduces air and water pollution and greenhouse gas (GHG) emissions, and recycles environmentally sensitive substances including lead, mercury, oil and unspent fuel.

Using recycled scrap iron and steel reduces the use of virgin iron ore, among other environmental benefits. Every ton of new steel made from scrap steel conserves





Self-Check -2	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next

Page:-

1. Write the wastes and scrapes recycled in automotive industry?

Note: Satisfactory rating - 5 points

Unsatisfactory - below 5 points

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____



Information Sheet - 3	Clean and inspect equipment and work area
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3.1. What is cleaning and maintenance?

Cleaning is the removal of all visible soil in an approved way with the use of mechanical and chemical action or both, so that all areas are cleaned and sanitized to a high standard. Cleaning is an investment in the assets of a building Maintenance is the upkeep of all body, seat interior and dashboard fittings and equipment to an exacting standard within the property so that all areas look consistently new and pristine.

Why do we clean?

There are many reasons why we clean but the most important ones are Health Regulations If your local government authority has health regulations regarding cleaning and sanitizing, then you must know these and follow their recommendations at all times. It is important when you are cleaning that you clean to a high standard that has been set for you by your supervisor or manager





Self-Check -3	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next

Page:-

1. What is cleaning and maintenance?

Note: Satisfactory rating - 5 points

Unsatisfactory - below 5 points

Answer Sheet

Score = _____
Rating: _____

Name: _____

Date: _____



4.1. Safe work procedures

Safe work procedures are a means of briefly documenting the risks associated with a work task and incorporating appropriate controls into a sequence of steps for doing the task safely. These documents are most effective when developed in consultation with your workers, and they provide a useful tool for training and supervising your workers. They should be reviewed if you have an incident at your workplace and/or changes occur in the workplace.

Ticks in the RED zone indicate that you need to take action immediately to identify the tasks your workers do that may expose them to safety risks. Work with them to develop simple procedures to do their work safely. A person conducting a business or undertaking has a duty to consult workers on health and safety issues directly affecting them.

4.2. Machinery Tag Out

Program: It governs lock out and/or tag out procedures to be used to verify that equipment or machines are isolated from all potentially hazardous energy. Machinery is to be locked out or tagged out before employees perform any servicing or maintenance activities where the unexpected start up or release of stored energy could cause injury.

Policy:

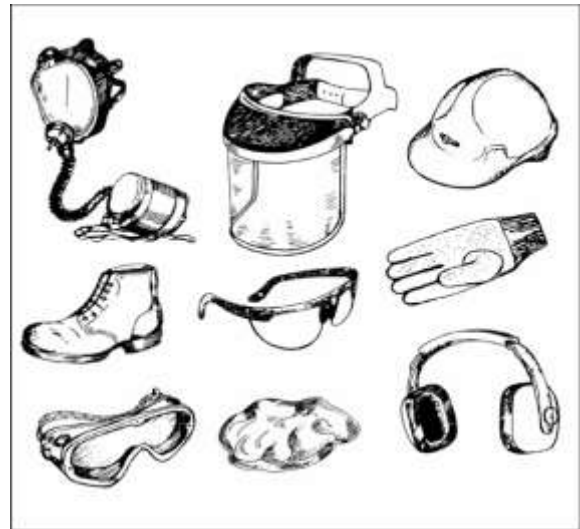
- ✓ Procedures described apply to all electrical equipment and machinery connected to an energy source by either hard wire or other permanent connection (hydraulic lines, electrical, etc.) that is repaired, serviced, or maintained by personnel.
- ✓ The Machinery Tag out Program applies to all equipment or machinery operated by mechanical, hydraulic, pneumatic, chemical, thermal, or other energy resources where the unexpected energizing could cause injury to employees or customers. Circuit breakers disconnect switches, and other energy isolating devices used to control the flow of energy to the machine/equipment must be operated in such a manner as to shut off or “isolate” all energy to the machine.



4.3. Sources of additional data/information gathering

There are two main types of sources in the field of information gathering, namely:

- I. Existing sources: existing sources are those sources of information that can be found in the printed, in video, in audio and other materials that are available to the public or upon request to proper bureaucracy.
- II. Natural sources: natural sources are first hand sources such as those who have tried products, services and methods, and expressing their experience and opinions to the information collector.



Purpose of gathering additional information

Researchers undertake information gathering in order to:

- ✓ Know the extent of resources that vested from inside and outside of the given community
- ✓ Create awareness on how to mobilize such resources timely
- ✓ Use resources to identify community connections, meet community needs, & other activities
- ✓ Recognize and value the resources within communities



Self-Check -4	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next

Page:-

1. What is RED zone?
2. What is machinery tag out program?

Note: Satisfactory rating - 5 points

Unsatisfactory - below 5 points

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____



Information Sheet - 5	Complete operator maintenance
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The purpose of this checklist is to document pre-existing vehicle/equipment condition and to determine suitability for incident use. I hereby acknowledge full responsibility and liability for the operation and mechanical condition of the vehicle/equipment described herein.

Section IV—TRANSPORT OR SUPPORT VEHICLES		Acceptable	
		YES	NO
1. "DOT" or CVSA inspection in the last 12 months (if required).	*		
2. Gauges and lights: mounted and function properly.	*		
3. Seat belts: operate properly for each seating position.	*		
4. Glass and mirrors, no cracks in vision.	*		
5. Wipers, washers, and horn operate properly.	*		
6. Clutch pedal: proper adjustment (if applicable).			
7. Cooling system: full, free of leaks and damage.			
8. Fluid levels (e.g. oil) and condition: full and clean.			
9. Battery: check for corrosion, loose terminals and hold downs.			
10. Fuel system: free of leaks and damage.	*		
11. Electrical system: alternator and starter work.			
MILES/HRS _____ DATE _____ TIME _____ Operator's printed name _____ Title _____ Operator's signature _____ Date _____ Inspector's printed name _____ Title _____			



Prevent or reduce the contamination of storm water resulting from vehicle and equipment maintenance by running a “dry and clean site”. The best option would be to perform maintenance activities at an offsite facility. If this option is not available then work should be performed in designated areas only, while providing cover for materials stored outside, checking for leaks and spills, and containing and cleaning up spills immediately. Employees and subcontractors must be trained in proper procedures

- Use offsite repair shops as much as possible. These businesses are better equipped to handle vehicle fluids and spills properly. Performing this work offsite can also be economical by eliminating the need for a separate maintenance area.
- If maintenance must occur onsite, use designated areas, located away from drainage courses.
- Dedicated maintenance areas should be protected from storm water run on and runoff, and should be located at least 50 ft from downstream drainage facilities and watercourses.
- Drip pans or absorbent pads should be used during vehicle and equipment maintenance work that involves fluids, unless the maintenance work is performed over an impermeable surface in a dedicated maintenance area.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- All fueling trucks and fueling areas are required to have spill kits and/or use other spill protection devices.
- Use adsorbent materials on small spills. Remove the absorbent materials promptly and dispose of properly.
- Inspect onsite vehicles and equipment daily at startup for leaks, and repair immediately
- Keep vehicles and equipment clean; do not allow excessive build-up of oil and grease.
- Segregate and recycle wastes, such as greases, used oil or oil filters, antifreeze, cleaning solutions, automotive batteries, hydraulic and transmission fluids. Provide secondary containment and covers for these materials if stored onsite.
- Train employees and subcontractors in proper maintenance and spill cleanup procedures.



- Drip pans or plastic sheeting should be placed under all vehicles and equipment placed on docks, barges, or other structures over water bodies when the vehicle or equipment is planned to be idle for more than 1 hour.
- For long-term projects, consider using portable tents or covers over maintenance areas if maintenance cannot be performed offsite.
- Consider use of new, alternative greases and lubricants, such as adhesive greases, for chassis lubrication and fifth-wheel lubrication.
- Properly dispose of used oils, fluids, lubricants, and spill cleanup materials.
- Do not place used oil in a dumpster or pour into a storm drain or watercourse.
- Properly dispose of or recycle used batteries.
- Do not bury used tires.



Self-Check -6	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next

Page:-

1. What does it mean when we say maintain tools and equipment's?

Note: Satisfactory rating - 5 points

Unsatisfactory - below 5 points

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____