MODULE CONTENT

| Unit of Competency | **DIAGNOSE AND REPAIR ENGINE COOLING AND LUBRICATION SYSTEM** |
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| Module Title | **DIAGNOSING AND REPAIRING ENGINE COOLING AND LUBRICATION SYSTEM** |
| Module Descriptor | This unit describes the performance outcomes required to diagnose and repair faults in the cooling systems of  vehicles such as radiator, water pump, and thermostat  and lubrication systems such as oil pump, oil cooler,  hoses and oil pressure switch. It covers the knowledge,  skills, and attitudes required to prepare to diagnose and  repair engine cooling and lubrication systems, diagnose  and repair engine cooling and lubrication system and  complete work processes. |
| Nominal Duration | **hours** |
| Summary of the Learning Outcomes: | |
| Upon completion of this module the student must be able to: | |
| LO1. Prepare to diagnose and repair drive lines | |
| LO2. Diagnose drive lines | |
| LO3. Repair drive lines | |
| LO4. Complete work processes | |

**LEARNING EXPERIENCES**

**LEARNING OUTCOMES NO. 4**

**COMPLETE WORK PROCESSES**

| **Learning Activities** | **Special Instructions** |
| --- | --- |
| Read Information Sheet 3.1-1 Complete work processes | If you have some problem on the content of the information sheet don’t hesitate to approach your Trainer.  If you feel that you are now knowledgeable on the content of the information sheet, you can now answer self-check provided in the module. |
| Answer Self-Check 3.1-1 on Complete work processes | Try to answer the Self-check without looking at the Answer Key  Compare your answer to Answer Key 3.1-1 |
| Observe Trainer’s demonstration on Task Sheet 3.1-1 on Complete work processes | Listen carefully and attentively so that you may be able to perform a task correctly  Ask questions if are in doubt for clarification |
| Perform the Task Sheet 3.1-1 on Complete work processes | Remember the step-by-step procedure the Complete work processes |
| Evaluate the performance using the Performance Criteria Checklist 3.1-1 | Repeat the task in case fail to meet the criteria |

**INFORMATION SHEET 1.1-1**

**COMPLETE WORK PROCESSES**

**Learning Objectives:**

After reading this **Information Sheet**, you must be able to:

1. Turned-over vehicle.
2. Restored work area.
3. Managed wastes.
4. Checked and stored tools and equipment.
5. Accomplished workplace documents.

**DRIVE LINES**

**Diagnostics/Findings**

**Vibration**

| **Condition** | **Cause** | **Correction** |
| --- | --- | --- |
| **Low gear shudders at full drive or full coast under light load conditions.** | 1. Improper phasing  2. Loose outside diameter fit on slip yoke spline  3. Cross assembly loose  4. Driveshaft out of balance or bent  5. Worn cross assembly | 1. Reassemble with correct phasing.  2. Change slip yoke and spline plug.  3. Inspect cross assembly for looseness; tighten to specification. Replace if necessary.  4. Rebalance/replace.  5. Replace cross assembly. |

**Premature Wear**

| **Condition** | **Cause** | **Correction** |
| --- | --- | --- |
| **Low mileage cross assembly wear** | 1. End yoke cross hole misalignment  2. Improper lubrication | 1. Use alignment bar to check for end yoke cross hole misalignment. Replace end yoke if misaligned.  2. Lubricate according to specifications (applies only to drivelines with greas able cross assemblies). |
| **Repeat cross assembly wear** | 1. Excessive continuous running load  2. Continuous operation at high angle high speed.  3. Worn or damaged seals. | 1. Replace with higher capacity universal joint and driveshaft.  2. Replace with higher capacity universal joint and driveshaft. Check universal joint operating angles. Reduce angles if necessary.  3. Replace cross assembly kit. |

**Slip Yoke Spline Wear**

| **Condition** | **Cause** | **Correction** |
| --- | --- | --- |
| **Seizure** | 1. Improper lubrication  2. Worn or damaged part  3. Contamination | 1. Lubricate slip yoke spline according to specifications. Check the seal.  2. Replace spline components.  3. Lubricate slip yoke spline according to specifications. Check the seal. |
| **Galling** | 1. Worn or damaged part  2. Contamination | 1. Replace spline components.  2. Lubricate slip yoke spline according to specifications. Check the seal. |
| **Outside diameter wear at extremities** | 1. Improper lubrication  2. Excessively loose outside diameter fi t | 1. Lubricate slip yoke spline according to specifications. Check the seal.  2. Replace spline components. |

**Shaft and/or Tube**

| **Condition** | **Cause** | **Correction** |
| --- | --- | --- |
| **Shaft support bearing wear** | Improper lubrication of bearings | Replace center bearing. |
| **Shaft support rubber insulator wear** | Shaft support bearing misaligned; interfered with slinger. | Realign mounting bracket to frame crossmember to eliminate interference with slinger. |
| **Tube circle weld fracture** | 1. Balance weight located in the apex of the weld yoke lug area.  2. Balance weight too close to circle weld.  3. Improper circle weld | 1. Replace tubing and rebalance  2. Replace tubing and rebalance  3. Replace tubing and rebalance |