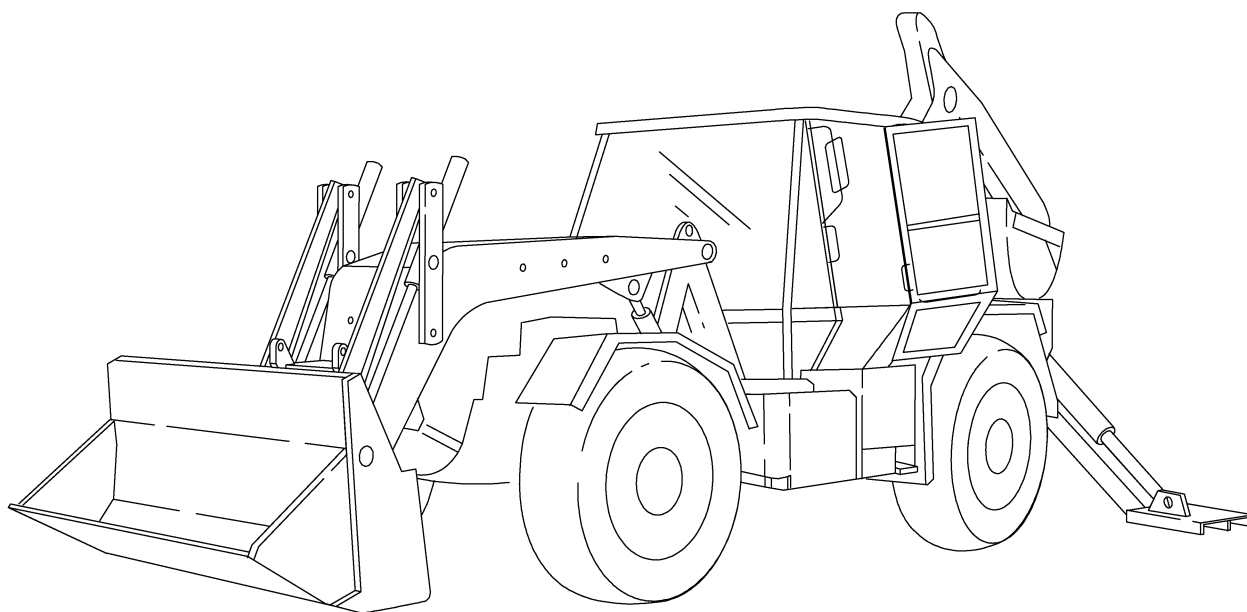

TECHNICAL MANUAL

**UNIT, DIRECT SUPPORT, AND GENERAL
SUPPORT MAINTENANCE MANUAL FOR
INTERIM HIGH-MOBILITY ENGINEER
EXCAVATOR (IHMEE)**

NSN 2420-66-148-7692



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ENGINE SERVICE AND TROUBLESHOOTING MANUALS

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Section I. U.S. Army Supplement to Cummins Material.

L-1. SCOPE.

This appendix contains information for servicing the engine. Section I. contains U.S. Army supplemental information to the vendor manual. The supplemental information includes initial setup task boxes for all maintenance tasks covered in the vendor manual that apply to the IHMEE. The supplemental information also includes individual task headings and page references to aid in locating the tasks in the vendor manual.

Section II. contains the manufacturer's technical manual. This manual is unedited and covers multiple models of Cummins engines. This manual also contains parts information for Cummins engines. Refer to Para L-2 for details on how to use this material.

Section III. is the manufacturer's troubleshooting manual. This manual is unedited and covers multiple models of Cummins engines. Refer to Para L-2 for details on how to use this material.

L-2. GENERAL.

To perform a task covered in this appendix, refer to the task box for initial setup information as you would with a normal maintenance procedure. The individual task headings have page references to aid in locating the tasks in the vendor manual. Most pages will also include two different page numbers. The appendix page number will have the appendix letter and a page number like the one at the bottom of this page. This page number will be used in all references made in Section I. The other page number is the vendor material page numbering. It will be used for any references made within the vendor material.

The IHMEE uses the Cummins 6 cylinder 6BT5.9 engine. All information in Section II. and Section III. that does not pertain to the 6BT5.9 engine and all parts information should be ignored. Refer to TM 5-2420-230-24P for parts information.

L-3. ENGINE REPAIR.

This Task Covers:

- a. Disassembly b. Assembly c. Follow-On Maintenance

INITIAL SETUP

Test Equipment
None

References
None

Tools and Special Tools

Tool kit, common no. 1, Item 35, Appendix B
Tool kit, general mechanics, Item 38, Appendix B

Equipment Conditions

TM or Para
Para 4-10

Condition Description
Engine separated from
transmission.

Materials/Parts
None

Drawings Required

TM 5-2420-230-24P Figure 1

Personnel Required

MOS 62B, Construction Equipment Repairer

Estimated Time to Complete Task
Refer to MAC in Appendix B

a. Disassembly.

WARNING

- Never crawl under equipment when performing maintenance unless equipment is securely blocked. Equipment may fall and cause serious injury or death to personnel.

Refer to page L-97 for disassembly.

b. Assembly.

WARNING

- Never crawl under equipment when performing maintenance unless equipment is securely blocked. Equipment may fall and cause serious injury or death to personnel.

Refer to page L-130 for assembly.

c. Follow-On Maintenance.

Connect engine to transmission (Para 4-10).

END OF TASK

L-4. STEAM CLEANING THE ENGINE.

This Task Covers:

- a. Servicing
b. Follow-On Maintenance

INITIAL SETUP

Test Equipment		Equipment Conditions	
None		TM or Para	Condition Description
		TM 5-2420-230-10	Vehicle positioned on level ground.
<i>Tools and Special Tools</i>			
	Tool kit, common no. 2, Item 36, Appendix B	TM 5-2420-230-10	Parking brake applied.
		TM 5-2420-230-10	Engine shut OFF.
<i>Materials/Parts</i>			
	None	TM 5-2420-230-10	Electrical master switch OFF.
		TM 5-2420-230-10	“Do Not Operate” tag attached to ignition switch.
<i>Personnel Required</i>			
	MOS 62B, Construction Equipment Repairer	TM 5-2420-230-10	Hood raised.
<i>References</i>		<i>Drawings Required</i>	
	None	None	
		<i>Estimated Time to Complete</i>	
		Refer to MAC in Appendix B	

a. Servicing.

Refer to page L-97 for steam cleaning.

b. Follow-On Maintenance.

- (1) Start engine and perform functional test (TM 5-2420-230-10).
- (2) Shut OFF engine (TM 5-2420-230-10).
- (3) Close engine hood and attach clips (TM 5-2420-230-10).
- (4) Remove “Do Not Operate” tag from ignition switch (TM 5-2420-230-10).

END OF TASK

L-5. ENGINE MOUNTING.

This Task Covers:

a. Mounting

b. Dismounting

c. Follow-On Maintenance

INITIAL SETUP

Test Equipment
None

References
None

Tools and Special Tools
Tool kit, common no. 1, Item 35, Appendix B
Field, maintenance, basic, Item 23, Appendix B
Lifting equipment, suitable

Equipment Conditions
TM or Para *Condition Description*
Para 4-10 Engine separated from
transmission.

Materials/Parts
Nut, self-locking, Item 112, Appendix D (4)

Drawings Required
TM 5-2420-230-24P Figure 23

Personnel Required
MOS 62B, Construction Equipment Repairer (2)

Estimated Time to Complete
Refer to MAC in Appendix B

a. Mounting.**WARNING**

- Never crawl under equipment when performing maintenance unless equipment is securely blocked. Equipment may fall and cause serious injury or death to personnel.
- Keep clear of equipment when equipment is being raised or lowered. Equipment may fall and cause serious injury or death to personnel.
- Do not work on any item supported only by lift jacks or hoist. always use blocks or proper stands to support the item prior to any work. Equipment may fall and cause serious injury or death to personnel.
- Do not allow heavy components to swing while hanging by lifting device. Equipment may strike personnel and cause injury.
- Exercise extreme caution when working near a cable or chain under tension. A snapped cable, shifting or swinging load may result in injury or death to personnel.

Refer to page L-97 to mount the engine.

b. Dismounting.

WARNING

- Never crawl under equipment when performing maintenance unless equipment is securely blocked. Equipment may fall and cause serious injury or death to personnel.
- Keep clear of equipment when equipment is being raised or lowered. Equipment may fall and cause serious injury or death to personnel.
- Do not work on any item supported only by lift jacks or hoist. always use blocks or proper stands to support the item prior to any work. Equipment may fall and cause serious injury or death to personnel.
- Do not allow heavy components to swing while hanging by lifting device. Equipment may strike personnel and cause injury.
- Exercise extreme caution when working near a cable or chain under tension. A snapped cable, shifting, or swinging load may result in injury or death to personnel.

Refer to page L-202 to dismount the engine.

c. Follow-On Maintenance.

Connect engine to transmission (Para 4-10).

END OF TASK

L-6. ENGINE REPAIR (REAR LIFTING BRACKET REPLACEMENT).

This Task Covers:

a. Removal

b. Installation

c. Follow-On Maintenance

INITIAL SETUP

Test Equipment
None

References
None

Tools and Special Tools
Tool kit, general mechanics, Item 38, Appendix B

Equipment Conditions
TM or Para *Condition Description*
Para L-5 Engine mounted.

Materials/Parts
Gasket, Item 60, Appendix D

Drawings Required
TM 5-2420-230-24P Figure 11

Personnel Required
MOS 62B, Construction Equipment Repairer

Estimated Time to Complete
Refer to MAC in Appendix B

a. Removal.

Refer to page L-98 for removal.

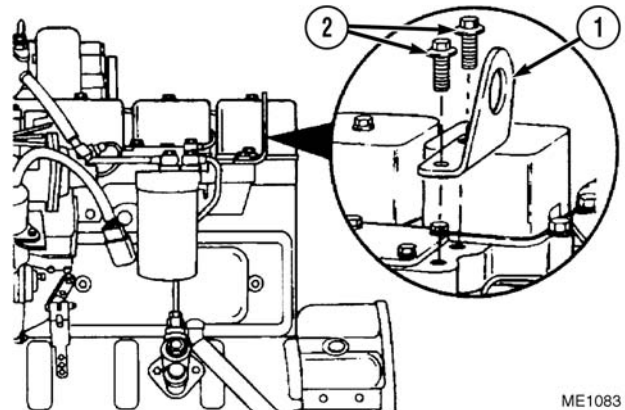
b. Installation.

Install rear lifting bracket (1) with two bolts (2).

c. Follow-On Maintenance.

Dismount engine (Para L-5).

END OF TASK



ME1083

L-7. ENGINE REPAIR (FAN PULLEY REPLACEMENT).

This Task Covers:

- | | | |
|------------|-----------------|--------------------------|
| a. Removal | b. Installation | c. Follow-On Maintenance |
|------------|-----------------|--------------------------|

INITIAL SETUP

Test Equipment

None

References

None

Tools and Special Tools

- Tool kit, common no. 1, Item 35, Appendix B
- Tool kit, general mechanics, Item 38, Appendix B

Equipment Conditions

- | | |
|-------------------|------------------------------|
| <i>TM or Para</i> | <i>Condition Description</i> |
| Para 4-6 | Drive belt removed. |

Materials/Parts

Gasket, Item 67, Appendix D

Drawings Required

TM 5-2420-230-24P Figure 7

Personnel Required

MOS 62B, Construction Equipment Repairer

Estimated Time to Complete

Refer to MAC in Appendix B

a. Removal.

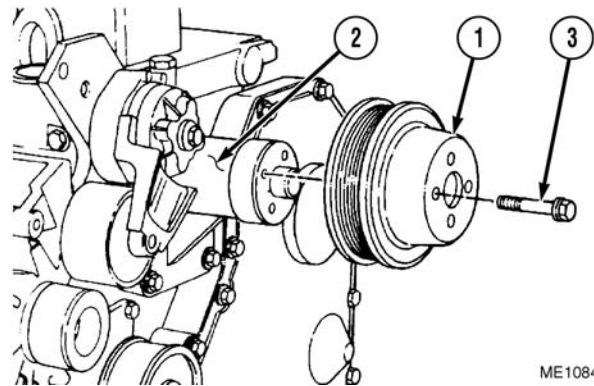
Refer to page L-99 for removal.

b. Installation.

Install fan pulley (1) to engine (2) with four bolts (3).

c. Follow-On Maintenance.

Install drive belt (Para 4-6).



ME1084

END OF TASK

L-8. ENGINE REPAIR (VIBRATION DAMPER/CRANKSHAFT PULLEY REPLACEMENT).

This Task Covers:

- | | | |
|-----------------|--------------------------|---------------|
| a. Removal | b. Servicing | c. Inspection |
| d. Installation | e. Follow-On Maintenance | |

INITIAL SETUP

Test Equipment
None

References
None

Tools and Special Tools
Tool kit, common no. 1, Item 35, Appendix B
Tool kit, general mechanics, Item 38, Appendix B

Equipment Conditions

<i>TM or Para</i>	<i>Condition Description</i>
Para 4-6	Drive belt removed.
Para 9-6	Hydraulic fan motor removed.

Materials/Parts
Developer, spot checker, Item 36, Appendix C
Solution, soap, Item 56, Appendix C
Solvent, degreasing, Item 58, Appendix C

Drawings Required
TM 5-2420-230-24P Figure 9

Personnel Required
MOS 62B, Construction Equipment Repairer

Estimated Time to Complete
Refer to MAC in Appendix B

a. Removal.

Refer to page L-99 for removal.

b. Servicing.

WARNING

- Degreasing Solvent (MIL-PRF-680) is toxic and flammable. Keep away from heat or flame. Never smoke when using solvent. The flashpoint for Type II Degreasing Solvent is 141 °F (61 °C). Wear protective goggles, face shield, and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes; and do not breathe vapors. Failure to comply may result in injury or death to personnel.
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

Refer to page L-242 for cleaning.

c. Inspection.

Refer to page L-242 for inspection.

d. Installation.

Refer to page L-199 for installation.

e. Follow-On Maintenance.

- Install drive belt (Para 4-6).
- Install hydraulic fan motor (Para 9-6).

END OF TASK

L-9. ENGINE REPAIR (BELT TENSIONER REPLACEMENT).

This Task Covers:

- | | | |
|--------------------------|---------------|-----------------|
| a. Removal | b. Inspection | c. Installation |
| d. Follow-On Maintenance | | |

INITIAL SETUP

Test Equipment
None

References
None

Tools and Special Tools
Tool kit, common no. 1, Item 35, Appendix B
Tool kit, general mechanics, Item 38, Appendix B

Equipment Conditions

<i>TM or Para</i>	<i>Condition Description</i>
Para 4-6	Drive belt removed.

Materials/Parts
None

Drawings Required
TM 5-2420-230-24P Figure 8

Personnel Required
MOS 62B, Construction Equipment Repairer

Estimated Time to Complete
Refer to MAC in Appendix B

a. Removal.

Refer to page L-99 for removal.

b. Inspection.

Refer to page L-399 for inspection.

c. Installation.

Refer to page L-200 for installation.

d. Follow-On Maintenance.

Install drive belt (Para 4-6).

END OF TASK

L-10. ENGINE REPAIR (FAN HUB REPLACEMENT).

This Task Covers:

- | | | |
|--------------------------|---------------|-----------------|
| a. Removal | b. Inspection | c. Installation |
| d. Follow-On Maintenance | | |

INITIAL SETUP*Test Equipment*

None

References

None

Tools and Special Tools

Tool kit, common no. 1, Item 35, Appendix B
 Tool kit, general mechanics, Item 38, Appendix B

Equipment Conditions

<i>TM or Para</i>	<i>Condition Description</i>
Para 4-6	Drive belt removed.

Materials/Parts

None

Drawings Required

TM 5-2420-230-24P Figure 7

Personnel Required

MOS 62B, Construction Equipment Repairer

Estimated Time to Complete

Refer to MAC in Appendix B

a. Removal.

Refer to page L-100 for removal.

b. Inspection.

Refer to page L-396 for inspection.

c. Installation.

Refer to page L-199 for installation.

d. Follow-On Maintenance.

Install drive belt (Para 4-6).

END OF TASK

L-11. ENGINE REPAIR (THERMOSTAT REPLACEMENT).

This Task Covers:

- | | | |
|------------|--------------------------|-----------------|
| a. Removal | b. Inspection | c. Installation |
| d. Testing | e. Follow-On Maintenance | |

INITIAL SETUP

Test Equipment
None

References
None

Tools and Special Tools
Tool kit, common no. 1, Item 35, Appendix B
Tool kit, general mechanics, Item 38, Appendix B

Equipment Conditions
TM or Para *Condition Description*
Para 9-4 Cooling system drained.

Materials/Parts
Gasket, Item 87, Appendix D

Drawings Required
TM 5-2420-230-24P Figure 28

Personnel Required
MOS 62B, Construction Equipment Repairer

Estimated Time to Complete
Refer to MAC in Appendix B

a. Removal.

Refer to page L-101 for removal.

b. Inspection.

Refer to page L-402 for inspection.

c. Installation.

Refer to page L-198 for installation.

d. Testing.

Refer to page L-402 for testing.

e. Follow-On Maintenance.

Refill cooling system (Para 9-4).

END OF TASK

L-12. TURBOCHARGER REPLACEMENT.

This Task Covers:

- | | | |
|-----------------|--------------------------|---------------|
| a. Removal | b. Servicing | c. Inspection |
| d. Installation | e. Follow-On Maintenance | |

INITIAL SETUP

Test Equipment

None

Personnel Required

MOS 62B, Construction Equipment Repairer

Tools and Special Tools

Tool kit, common no. 1, Item 35, Appendix B
Tool kit, general mechanics, Item 38, Appendix B

References

None

Materials/Parts

Antiseize compound, Item 12, Appendix C
Oil, lubricating, OE/HDO 30, Item 44, Appendix C
Adhesive, sealant, Item 25, Appendix C
Solvent, degreasing, Item 58, Appendix C
Gasket, Item 62, Appendix D
Gasket, Item 76, Appendix D

Equipment Conditions

<i>TM or Para</i>	<i>Condition Description</i>
TM 5-2420-230-10	Hood raised.

Drawings Required

TM 5-2420-230-24P	Figure 39
TM 5-2420-230-24P	Figure 40

Estimated Time to Complete

Refer to MAC in Appendix B

a. Removal.

WARNING

Allow engine to cool before performing maintenance on the muffler, exhaust pipe, exhaust manifold, or turbocharger. If necessary, use insulated pads and gloves.

Refer to page L-101 for removal.

b. Servicing.

WARNING

- Degreasing Solvent (MIL-PRF-680) is toxic and flammable. Keep away from heat or flame. Never smoke when using solvent. The flashpoint for Type II Degreasing Solvent is 141 °F (61 °C). Wear protective goggles, face shield, and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes; and do not breathe vapors. Failure to comply may result in injury or death to personnel.
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.
- To avoid personal injury, wear protective equipment when using compressed air. Failure to comply may result in injury or death to personnel.

Refer to page L-414 for cleaning.