

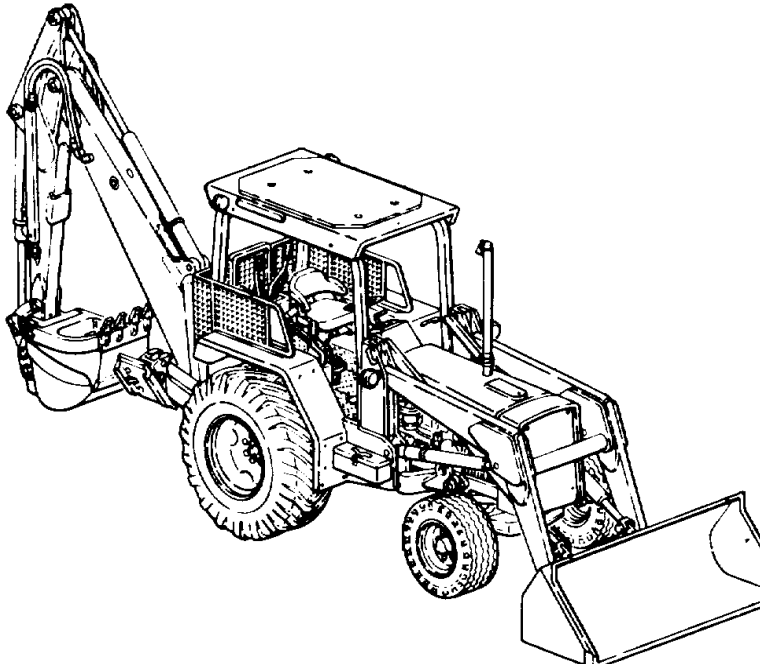


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TECHNICAL MANUAL
ORGANIZATIONAL MAINTENANCE MANUAL
VOLUME 1 OF 3



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**TRACTOR, WHEELED (DED)
LOADER BACKHOE
W/HYDRAULIC IMPACT TOOL AND
WIHYDRAULIC EARTH AUGER ATTACHMENT
JOHN DEERE MODEL JD410 (CCE)
W/WAIN-ROY BUCKET, HUGHES IMPACTOR
AND DANUSER EARTH DRILL
(NSN 2420-00-5671 035)**

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED

1 SEPTEMBER 1987

HEADQUARTERS, DEPARTMENT OF THE ARMY

WARNING

Although ignition lock switch must be on and battery ground cable connected to test electrical circuit voltage, turn off ignition lock switch and disconnect battery ground cable before doing resistance tests or replacing parts. This will keep you from getting shocked and prevent damage to parts and equipment.

WARNING

Do not smoke, use open flame, or allow sparks near batteries. The mixture of oxygen and hydrogen gases released from batteries is highly flammable and can explode causing serious injury or death.

WARNING

Ether burns easily. If engine starting aid is not properly installed, do not release ether in confined areas or near open flame. Engine primer fluid cylinder is pressurized to expel ether when fluid injection solenoid is activated. Do not heat engine primer fluid cylinder or place it in fire.

WARNING

No open flames, welding, grinding, smoking, or use of heat producing devices permitted near fuel tank and fuel lines during maintenance unless the fuel tank has been cleaned and purged of all flammable liquids and vapors. Fuel burns easily and fumes are explosive. Keep battery disconnected. Failure to observe these precautions could cause serious injury.

WARNING

No open flames, welding, grinding, smoking, or use of heat producing devices permitted near fuel tank and fuel lines during maintenance unless the fuel tank has been cleaned and purged of all flammable liquids and vapors. Fuel burns easily and fumes are explosive. Failure to observe these precautions could cause serious injury.

WARNING

Be careful when removing radiator cap. If engine is hot, escaping steam could burn you. Use a rag to cover radiator cap to protect your hand. Unscrew cap just enough to allow any built-up steam to escape. When all pressure has been relieved, unscrew cap the rest of the way, and take it off of radiator.

WARNING

Keep clear of area between main frame and backhoe boom, and other backhoe components, when backhoe control levers are being operated. There is no clearance for personnel when boom is swung full-left or full-right.

WARNING

Avoid contact with live steam. Live steam can burn skin, cause blindness, and cause other serious injury. Be sure to wear protective apron, gloves, and safety goggles when using live steam.

WARNING

Compressed air used for blowing away chips, dirt, etc., must leave nozzle at less than 30 psi (207 kPa) to prevent personal injury. Be certain that nozzle is rated to provide a maximum of 30 psi (207 kPa). Be sure to wear safety goggles or lenses when using compressed air. Compressed air and particles moved by compressed air can cause damage to your eyes.

WARNING

Drycleaning solvent P-D-680 is toxic and flammable. Wear protective goggles and gloves and use only in a well ventilated area. Avoid contact with skin, eyes, and clothes and don't breathe vapors. Do not use near open flame or excessive heat. The flashpoint is 1000F to 1380F (380 to 590C). If you become dizzy while using cleaning solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

WARNING

Cleaning compound, trichlorotrifluoroethane, for electrical parts is toxic and flammable, and reacts violently with aluminum, titanium, barium, lithium, samarium, sodium, and potassium. Always wear protective goggles and rubber gloves, and use only in a well-ventilated area. DO NOT wear jewelry while using cleaning compound. Avoid contact with skin, eyes, and clothes, and DO NOT breathe vapors. Cleaning compound fumes or vapors can take the place of air and may become a cancer producing agent. DO NOT use near open flame or excessive heat. The compound's boiling point is 114°F (460C). If you become dizzy while using cleaning compound, immediately get fresh air and medical help. If compound contacts eyes, immediately wash your eyes with water and get medical aid.

WARNING

Do not touch heat shrinkable tubing for at least 30 seconds after heating. hot tubing can burn you.

WARNING

Although battery ground cable must be connected to test electrical circuit voltage, disconnect battery ground cable before doing resistance tests or replacing parts. This will keep you from getting shocked and prevent damage to parts and equipment.

WARNING

Be careful when heating fluids. Wear gloves to protect your hands from hot parts and fluids or severe burns could result.

WARNING

Be careful of moving parts when working near engine while it is running. Moving parts could catch on tools, clothing, or extremities causing serious injury.

WARNING

After Nuclear, Biological, or Chemical (NBC) exposure of this vehicle, all air filters shall be handled with extreme caution. Unprotected personnel may experience injury or death if residual toxic agents or radioactive material are present. If vehicle is exposed to chemical or biological agents, servicing personnel shall wear protective mask, hood, protective overgarments, and chemical protective gloves and boots. All contaminated air filters shall be placed into double-lined plastic bags and swiftly moved to a segregation area away from the worksite. The same procedure applies for radioactive dust contamination, however, the Company NBC team should measure the radiation prior to filter removal to determine the extent of safety procedures required per the NBC Annex to the unit Standard Operating Procedures (SOP). The segregation area in which the contaminated air filters are temporarily stored shall be marked with appropriate NBC placards. Final disposal of contaminated air filters shall be in accordance with local SOP.

WARNING

Water soluble cleaning compound solvent is flammable and fumes are toxic. Flashpoint is 2200F (1040C). Boiling point is 212°F (1000C). Do not store in temperatures above 150°F (65°C) or below 35°F (2°C). Do not use near open flame or excessive heat. Do not wear jewelry. Wear rubber gloves and goggles, and use only in well ventilated area. Avoid contact with skin, eyes, and clothes, and don't breathe vapors. Avoid contact with acids, aluminum, or zinc; chemical reaction may result. If you become dizzy while using cleaning compound solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

WARNING

Speed control arms are under strong spring tension. Release tension slowly to avoid injury.

WARNING

Exhaust system parts become very hot when engine is running. Allow time for parts to cool before working on exhaust system. Hot exhaust system parts will cause serious burns.

WARNING

Draining hot cooling system is not recommended. If coolant must be drained with engine hot, use gloves to protect against hot coolant. Severe burns could result.

WARNING

Be careful when draining hot fluids. Wear gloves to protect your hands from hot parts and fluids or severe burns could result.

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CHANGE
NO. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington D. C., 8 April 1992

ORGANIZATIONAL MAINTENANCE MANUAL

**TRACTOR, WHEELED,
DED, LOADER BACKHOE:
WITH HYDRAULIC IMPACT TOOL AND
WITH HYDRAULIC EARTH AUGER ATTACHMENT
JOHN DEERE MODEL JD410 (CCE)
WITH BUCKET, IMPACTOR,
AND EARTH DRILL
(NSN 2420-00-567-0135)**

TM 5-2420-222-20-1, 1 September 1987, is changed as follows:

1. Cover. The manual title is changed to read as shown above.
2. Remove old pages and insert new pages.
3. New or changed material is indicated by a vertical bar in the margin or by a vertical bar adjacent to the TA number.

Remove Pages

a and b
i and ii
1-1 through 1-4
2-49 and 2-50
2-161 and 2-162

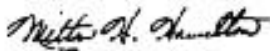
Insert Pages

a and b
i and ii
1-1 through 1-4
2-49 and 2-50
2-161 and 2-162

4. File this change sheet in front of the publication for reference purposes. Approved for public release; distribution is unlimited.

Approved for public release; distribution is unlimited.

By Order of the Secretary of the Army:

Official: 

MILTON H. HAMILTON
*Administrative Assistant to the
Secretary of the Army*
00772

GORDON R. SULLIVAN
*General, United States Army
Chief of Staff*

Distribution:

To be distributed in accordance with DA Form 12-25-E (Block 3692) Unit maintenance requirements for TM5-2420-222-20-1.

TECHNICAL MANUAL

NO. 52420-222-20-1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC 1 September 1987

ORGANIZATIONAL MAINTENANCE MANUAL

TRACTOR, WHEELED,
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WITH HYDRAULIC IMPACT TOOL AND
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(NSN 2420-00-567-0135)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, US Army Tank-Automotive Command, ATTN: AMSTA-MB, Warren, MI 48397-5000. A reply will be sent to you.

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*This manual supersedes Organizational portion of TM 5-2420-222-14&P1 and TM 5-2420-222-14&P2 dated October 1982, including all changes.

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HOW TO USE THIS MANUAL

This manual is divided into three volumes: TM 5-2420-222-20-1, TM 5-2420-222-20-2 and TM 52220-222-20-3. It is designed to help you maintain the loader backhoe. Front cover Table of Contents for this volume is provided for quick reference to important information. There is also an index located in the final pages of each volume for use in locating specific items of information.

Measurements in this manual are given in both US standards and metric units. Metric to US standard conversion chart can be found on the inside back cover.

Read all preliminary information found at the beginning of each task. It has important information you must have before beginning the task.

Warning pages are located in the front of each volume for warnings used in that volume. You should learn warnings before doing maintenance on equipment.

Subject index appears at the beginning of each chapter listing sections that are included in that chapter. A more specific subject index is located at the beginning of each section to help you find the exact paragraph you're looking for.

CHAPTER 1
INTRODUCTION

OVERVIEW

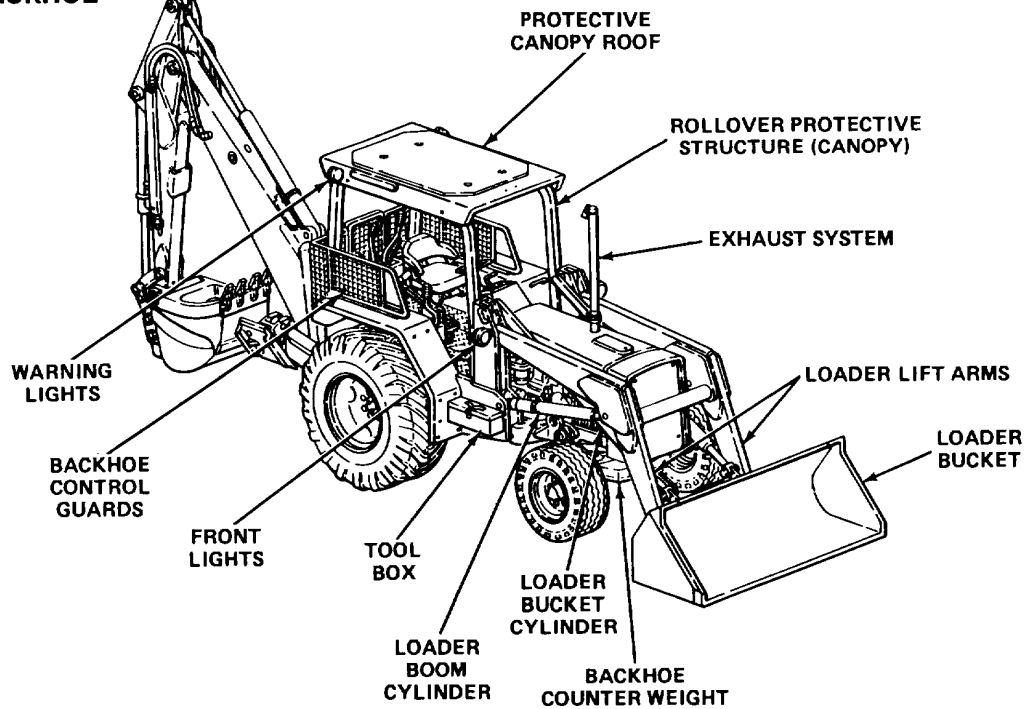
The purpose of this chapter is to give you general information and equipment specifications, and familiarize you with the principles of operation that you will need to refer to while performing organizational maintenance on the loader backhoe.

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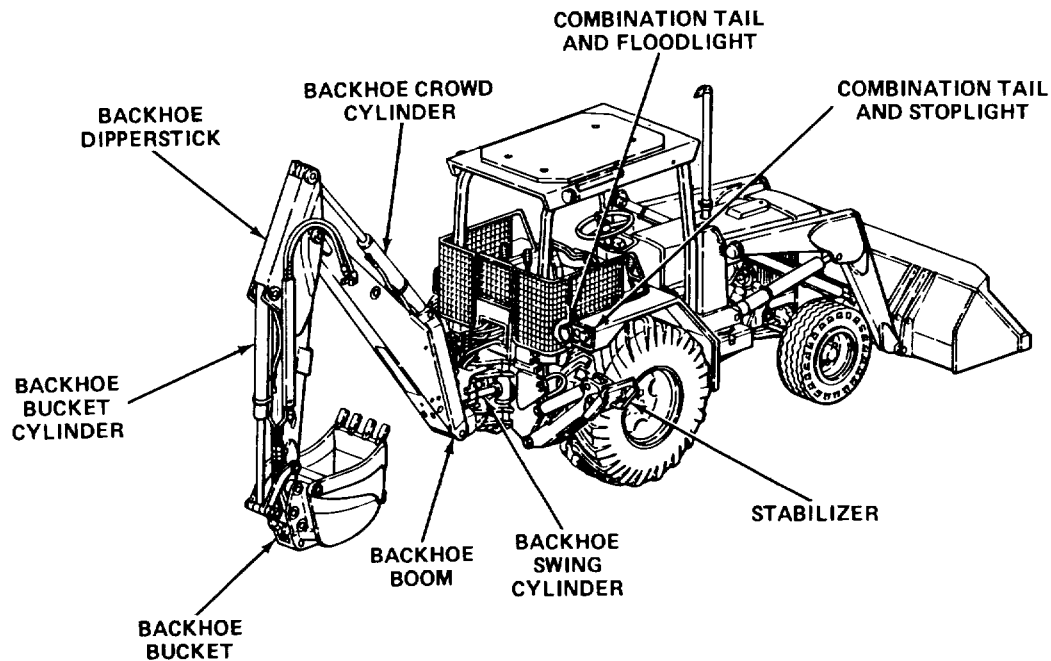
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LOADER BACKHOE



LOADER BACKHOE - CONTINUED



TA242673

SCOPE

Type of Manual: Organizational Maintenance

Model Number and Equipment Name: John Deere Model JD 410, Wheeled Tractor Loader Backhoe with Hydraulic Impact Tool and Hydraulic Earth Auger Attachment.

Short Item Name: Loader backhoe

Purpose of Equipment: Excavation for pipelines, building footings, drainage ditches and fortification, stockpiling, loading, transferring stockpiled materials, backfilling, rock and concrete breaking, tamping, asphalt cutting, earth boring and post driving.

MAINTENANCE FORMS, RECORDS, AND REPORTS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750, The Army Maintenance Management System (TAMMS).

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

■ Refer to TM 750-244-3 for instructions on the destruction of Army materiel to prevent enemy use.

EQUIPMENT IMPROVEMENT REPORT AND MAINTENANCE DIGEST (EIR MD)

The quarterly Equipment Improvement Report and Maintenance Digest, TB 43-0001-39 series, contains valuable field information on the equipment covered in this manual. The information in the TB 43-0001-39 series is compiled from some of the Equipment Improvement Reports that you prepared on the vehicles covered in this manual. Many of these articles result from comments, suggestions, and improvement recommendations that you submitted to the EIR program. The TB 43-0001-39 series contains Information on equipment improvements, minor alterations, proposed Modification Work Orders (MWO's), warranties (if applicable), actions taken on some of your DA Form 2028's (Recommended Changes to Publications), and advance information on proposed changes that may affect this manual. The information will help you in doing your job better and will help in keeping you advised of the latest changes to this manual. Also, refer to DA PAM 310-1 (Consolidated Index of Army Publications and Blank Forms) and Appendix A, References (page A-1), of this manual.

PREPARATION FOR STORAGE OR SHIPMENT

Refer to TM 740-90-1 for instructions on the administrative storage of Army materiel. Refer to Section XXV, Preparation for Storage and Shipment (page 2-1897) for special instructions for loader backhoe storage.

QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

Make sure that you do all your work with quality of workmanship in mind. Use the following check list as a guide:

Always use the right tool for the job.

Make sure that calibration stickers on test equipment are current, not out of date.

Fill out all required forms and make sure all in-time inspections are properly stamped.

Have all your work checked by your supervisor.

If you have any doubts about performing a maintenance task, notify your supervisor.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR's)

If your loader backhoe needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an SF 368 (Product Quality Deficiency Report). Mail it to us at: Commander, U.S. Army Tank-Automotive Command, Attn.: AMSTA-MP, Warren, MI, 48397-5000. We'll send you a reply.

Section II. EQUIPMENT DESCRIPTION AND DATA

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EQUIPMENT DESCRIPTION

Refer to TM 5-2420-222-10 for a description of the loader backhoe.

DIFFERENCES BETWEEN MODELS

Although all model JD 410 loader backhoes covered by this manual have the same model number, there are significant differences in configuration. There are two basic configurations: early configuration, Serial Numbers 235786 thru 235999, and late configuration, Serial Numbers 319995 thru 342573. These two configurations differ mostly in transmission design and hydraulic line routing.

Throughout this manual, where differences in configuration or equipment affect operation or maintenance, they are shown in detail. If differences are minor and obvious (such as exact appearance or location), and operation and maintenance are not affected, typical equipment is shown.

EQUIPMENT DATA

Refer to TM 5-2420-222-10 for information on loader backhoe identification and data plates, and end item and component specifications.

Section III. PRINCIPLES OF OPERATION

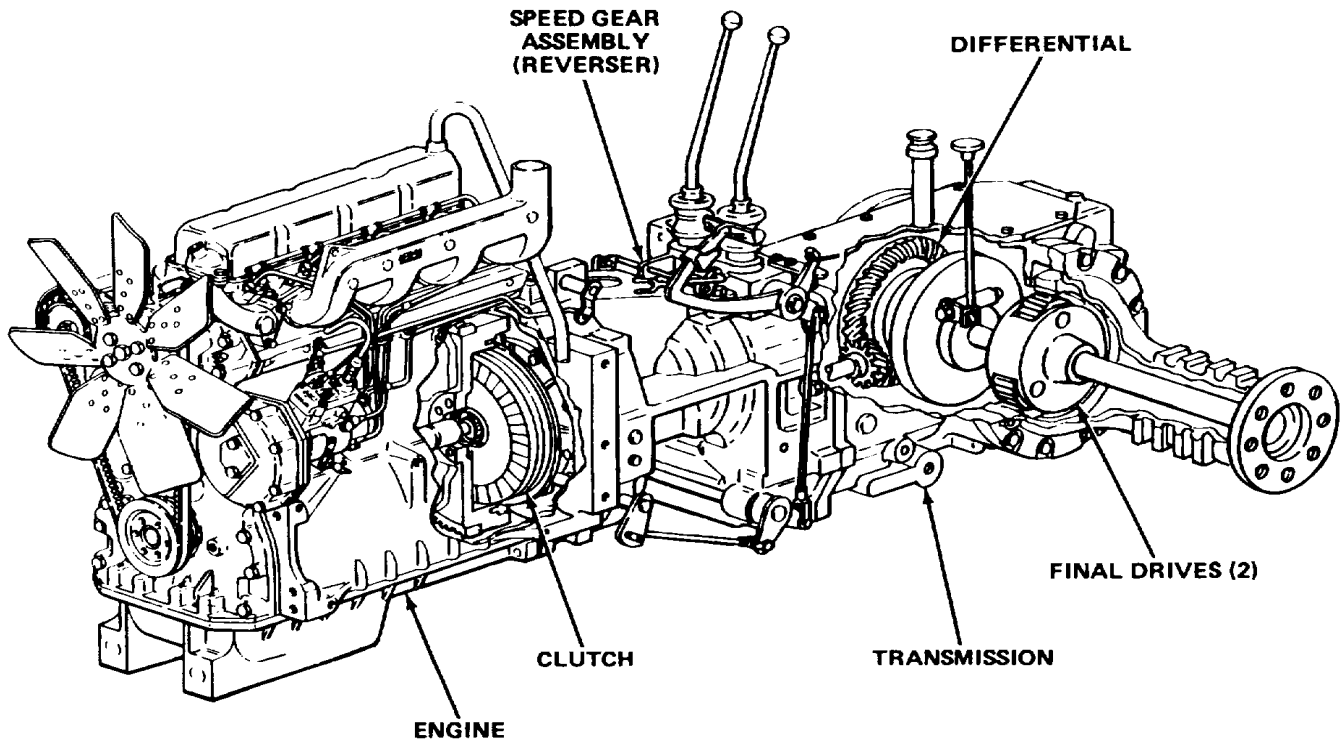
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CAUTION

When Serial Number ranges are given, be sure to use proper parts for replacement. Although parts for both configurations may appear to be interchangeable, they may function differently. Use of wrong parts could cause equipment failure and serious damage.

GENERAL

The loader backhoe is made up of several systems or groups of components. These systems are put together to make an efficient earthmoving machine. Since each system is designed to work with the others, it cannot function on its own. The following paragraphs single out systems for the purpose of discussion.

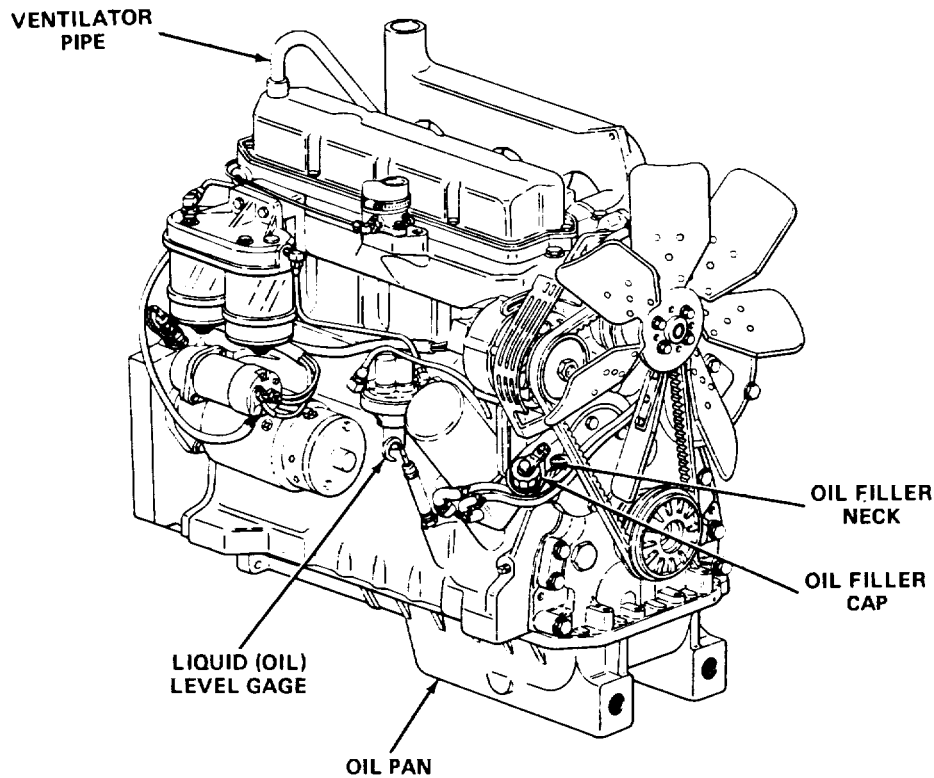


POWER TRAIN

- Engine, clutch, speed gear assembly (reverser), transmission, and drive train systems form the loader backhoe power train.
- Power developed by governed diesel engine speed is transmitted through clutch, speed gear assembly (reverser), transmission, differential, and final drives to drive rear wheels.

TA242674

LUBRICATION SYSTEM



OIL FILLER CAP

- Closes end of oil filler neck to keep dirt out of lubrication system.
- Allows access to oil filler neck.

OIL FILLER NECK

- Allows addition of lubricating oil to crankcase.

LIQUID (OIL) LEVEL GAGE

- Dipstick gage shows engine lubricating oil level.

VENTILATOR PIPE

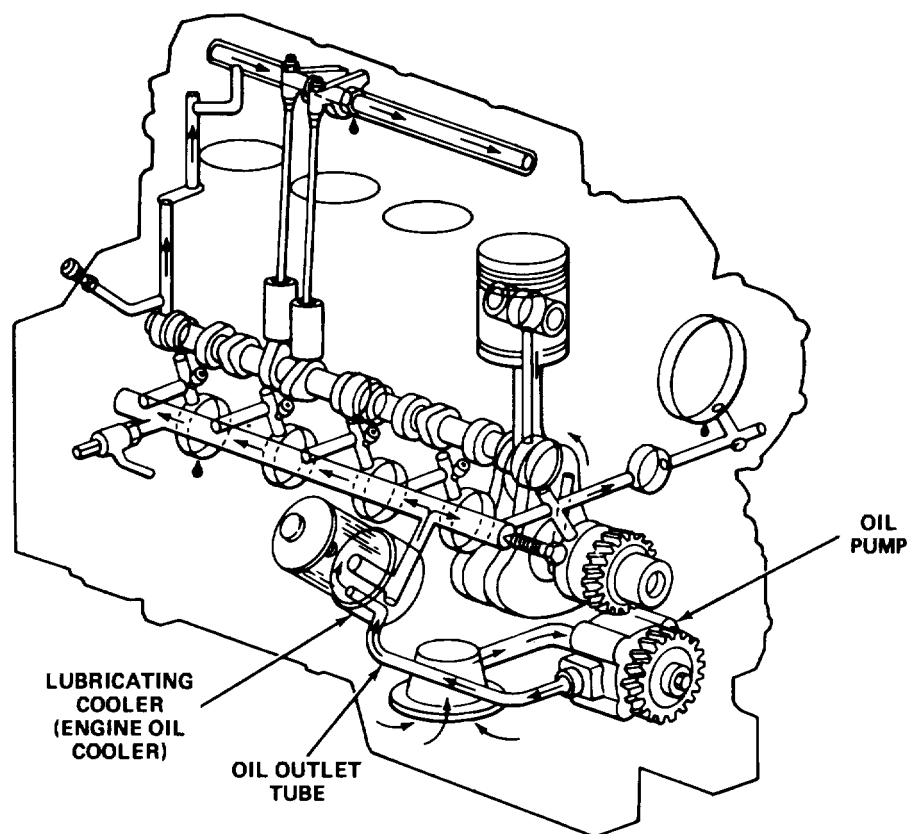
- Allows hot gases to escape from crankcase during engine operation.
- Allows outside air to enter crankcase during engine cool down.
- Keeps pressure in crankcase the same as outside air pressure at all times.

OIL PAN

- Provides reservoir for lubricating oil to be circulated through the lubrication system.

TA242675

LUBRICATION SYSTEM - CONTINUED



OIL PUMP

- Mounted to bottom of engine block at rear of engine.
- Driven directly by crankshaft gear.
- Suction tube is submerged in lubricating oil in oil pan.
- Moves lubricating oil through lubrication system.

OIL OUTLET TUBE

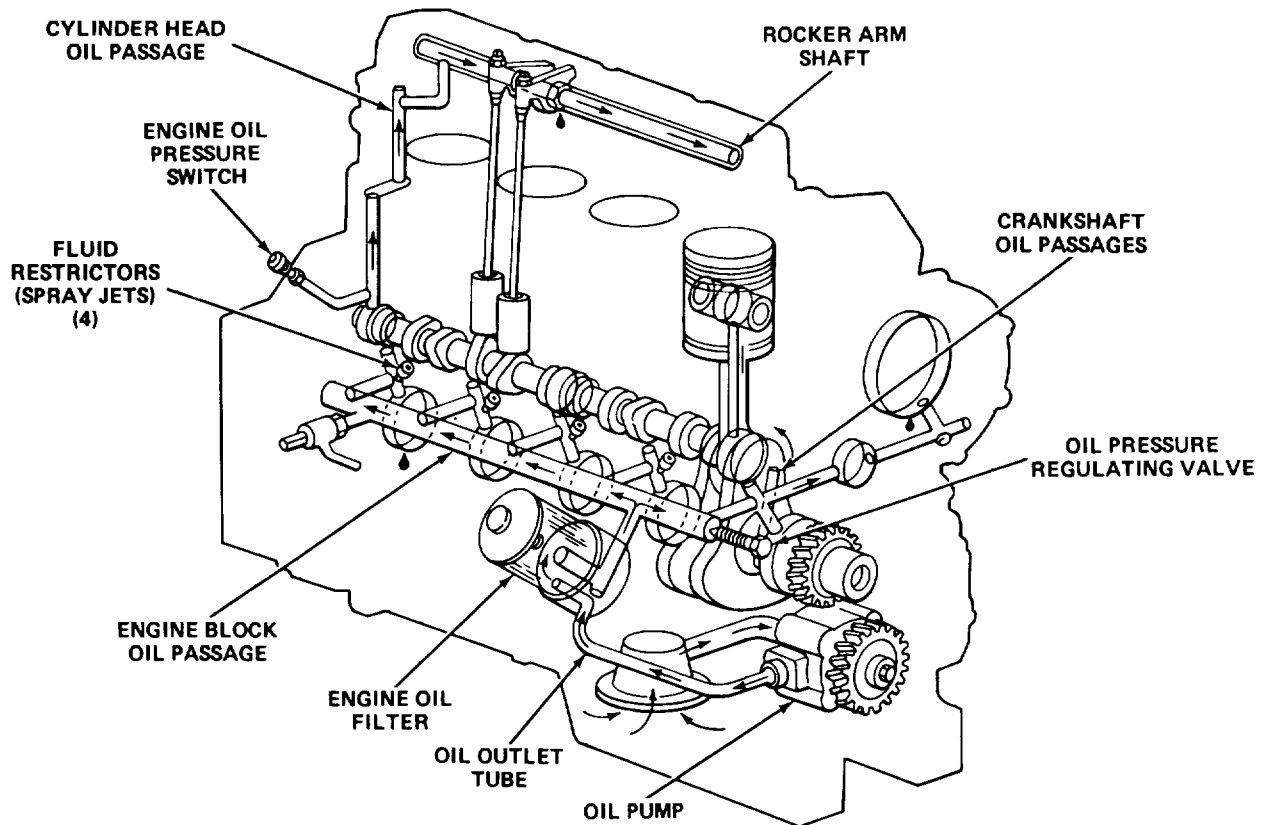
- Routes lubricating oil from oil pump outlet to lubricating cooler (engine oil cooler), engine oil filter, and engine block oil passage.

LUBRICATING COOLER (ENGINE OIL COOLER)

- Uses coolant from engine cooling system to cool lubricating oil.
- Helps keep engine running below maximum operating temperature.
- If cooler clogs, bypass valve opens to keep full flow of lubricating oil through engine lubrication system.

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LUBRICATION SYSTEM - CONTINUED



TA242677

ENGINE OIL FILTER

- Spin-on full-flow replaceable element mounted to top of lubricating cooler (engine oil cooler).
- Cleans all lubricating oil before it is distributed to the rest of the lubrication systems.
- If filter clogs, bypass valve in element opens to keep full flow of lubricating oil through engine lubrication system.

ENGINE BLOCK OIL PASSAGE

- Drilled passages in engine block distribute lubricating oil from oil filter to engine components.

OIL PRESSURE REGULATING VALVE

- Adjustable valve located at front end of main engine block oil passage.
- Controls lubrication system oil pressure.

FLUID RESTRICTORS (SPRAY JETS) (4)

- Fed by engine block oil passages.
- Spray bottom of pistons and connecting rods to cool and lubricate them.

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LUBRICATION SYSTEM - CONTINUED

CRANKSHAFT OIL PASSAGES

- Drilled passages in crankshaft route lubricating oil from crankshaft main bearings to connecting rod bearings.

ENGINE OIL PRESSURE SWITCH

- Sending unit considered part of electrical system.
- Activates low engine oil pressure indicator light on dash to alert operator when pressure drops below safe operating limit.

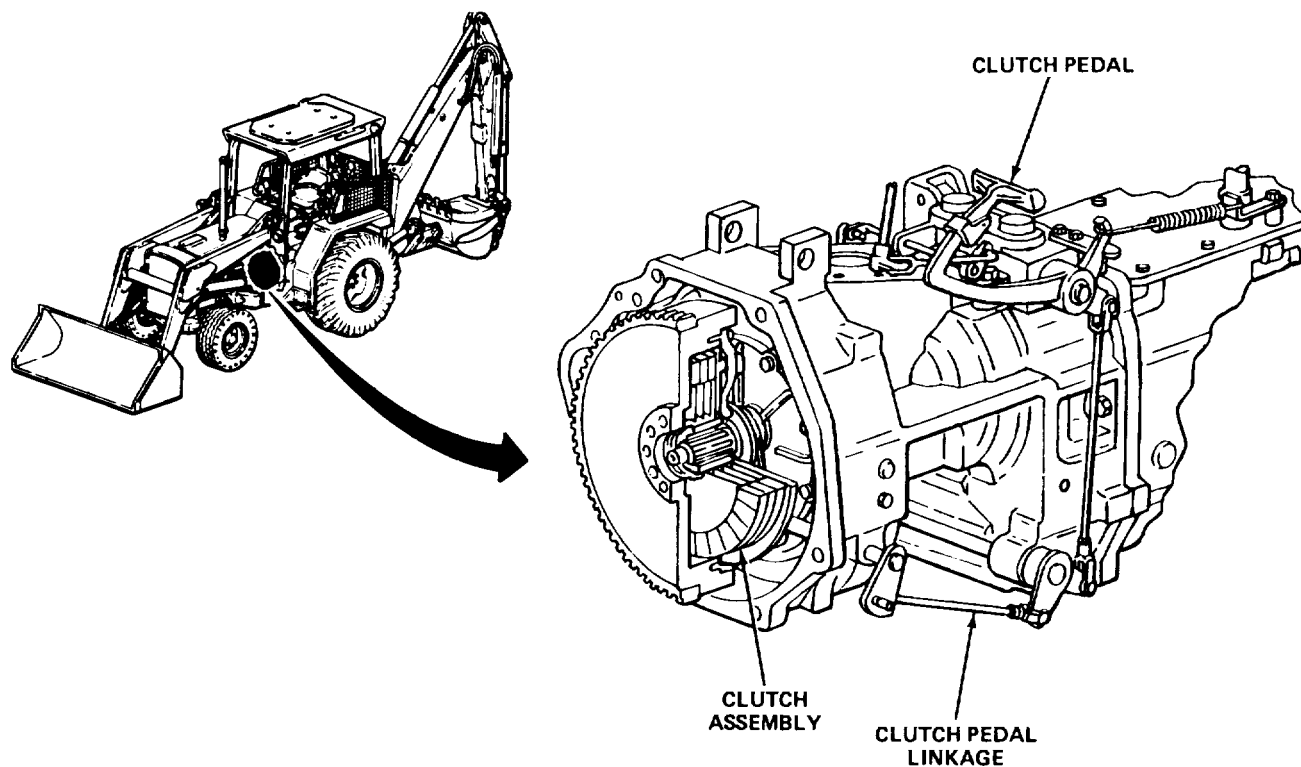
CYLINDER HEAD OIL PASSAGE

- Drilled passage in cylinder head routes lubricating oil from rear engine block oil passage to rocker arm shaft.

ROCKER ARM SHAFT

- Hollow shaft routes lubricating oil from cylinder head oil passage to rocker arms.

CLUTCH SYSTEM



CLUTCH PEDAL

- Provides operator with means to engage and disengage clutch.
- Connected by clutch pedal linkage to clutch assembly manual control lever.

CLUTCH PEDAL LINKAGE

- Mechanical linkage connects clutch pedal to clutch assembly manual control lever.

CLUTCH ASSEMBLY

- Single-stage clutch assembly components are located between engine flywheel and reverser housing.
- Provides means to engage and disengage engine power from balance of power train.