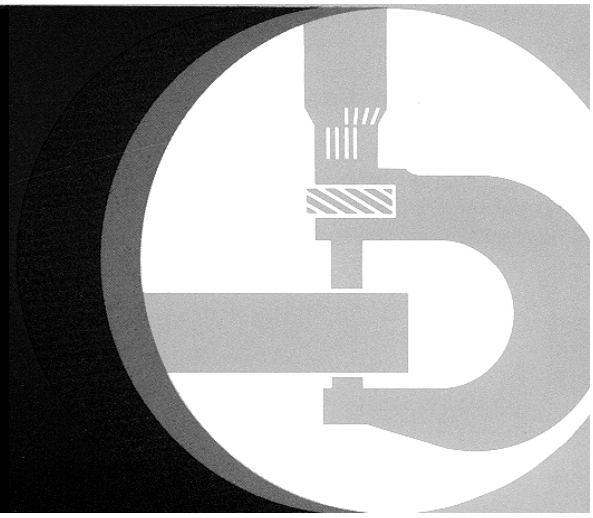
535
Log Loader

SERVICE MANUAL



For complete service information also see:

POWERTECH® 8.1 L (6081) Diesel Engines Repair	**CTM86**
POWERTECH® 8.1 L (6081) Diesel Engines Operation and Diagnostics	**CTM134**
Alternators and Starting Motors	**CTM77**

John Deere Dubuque Works
TM1876 (01DEC00)
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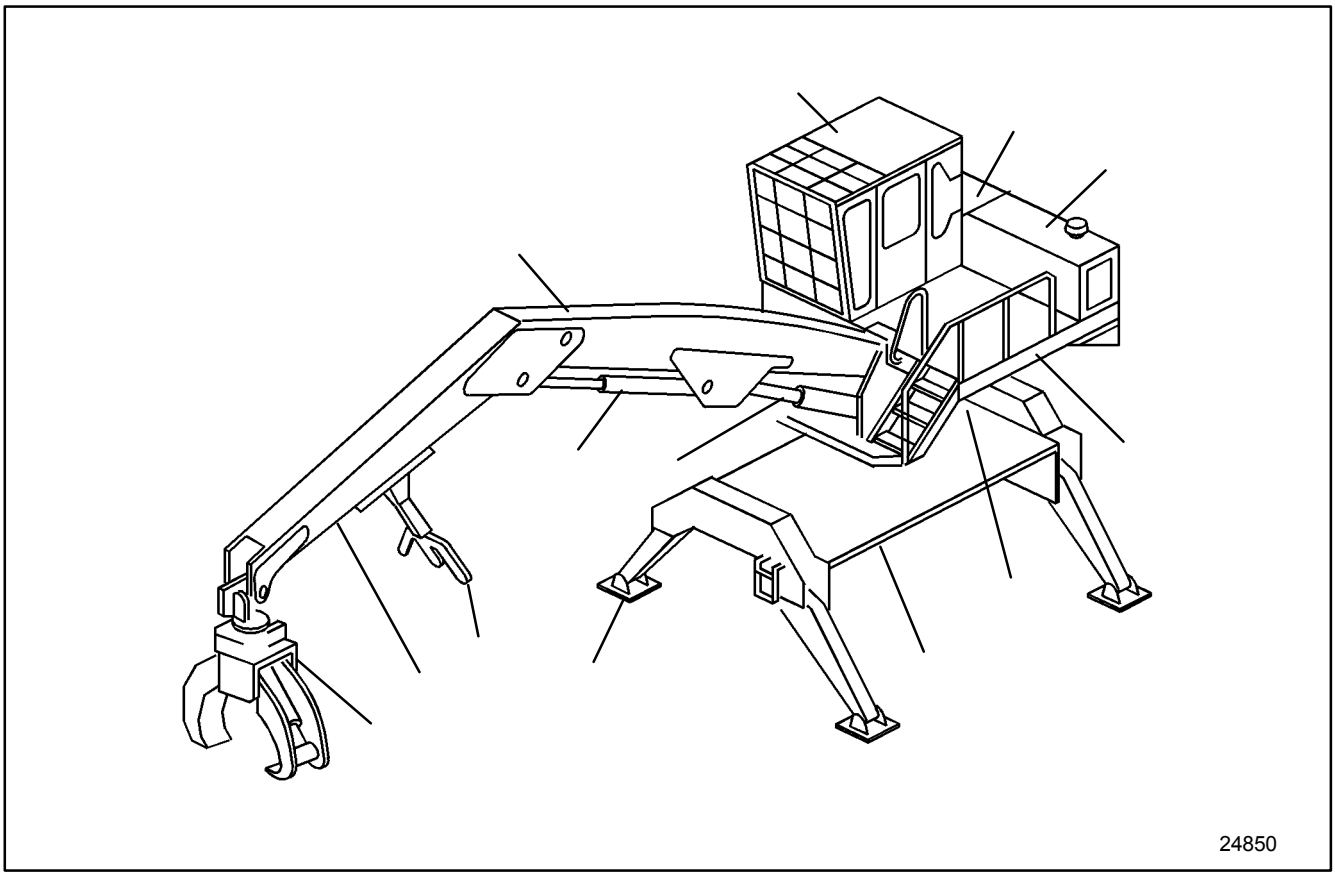
ENGLISH

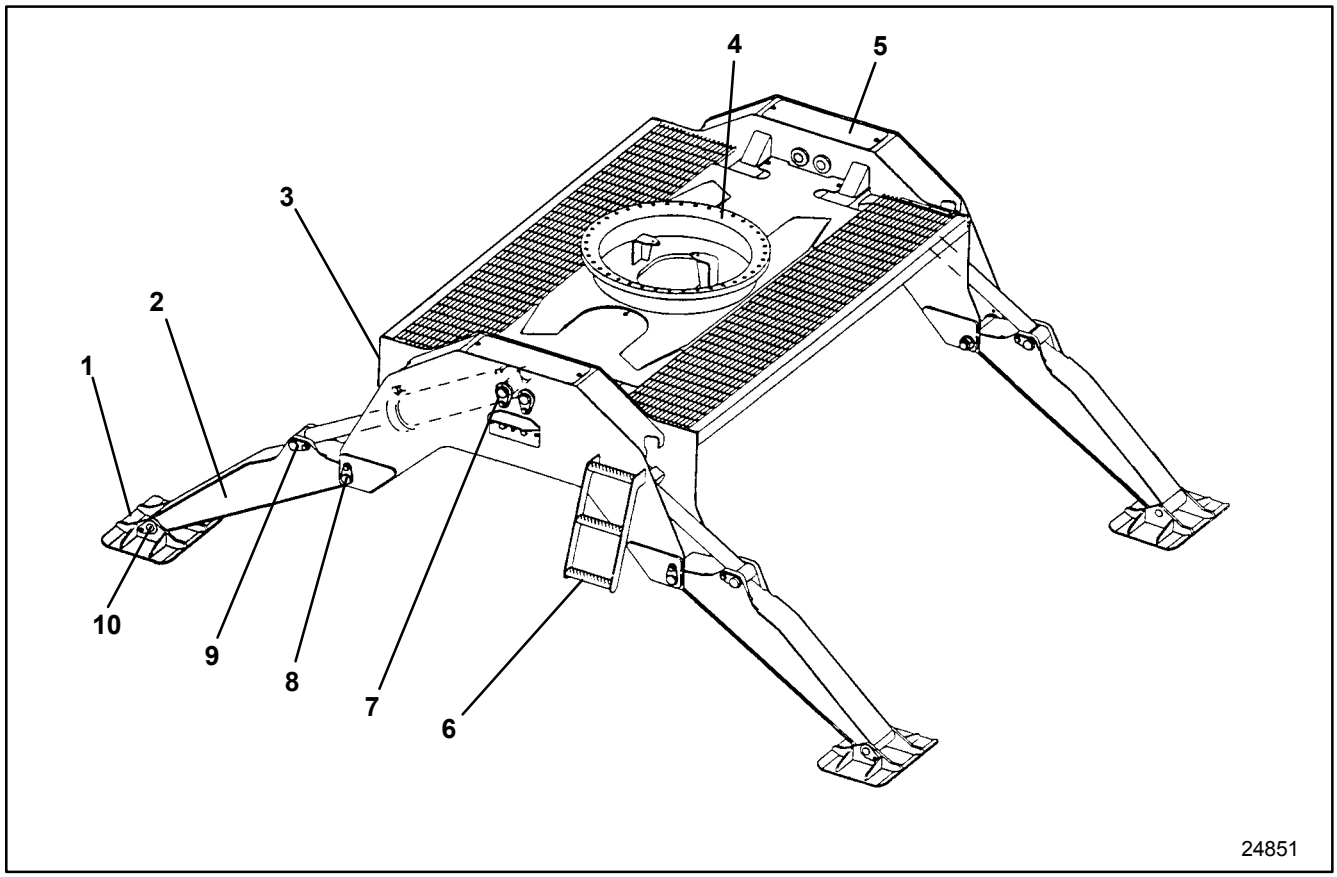
0060 Component Locators

1. General Component Locator



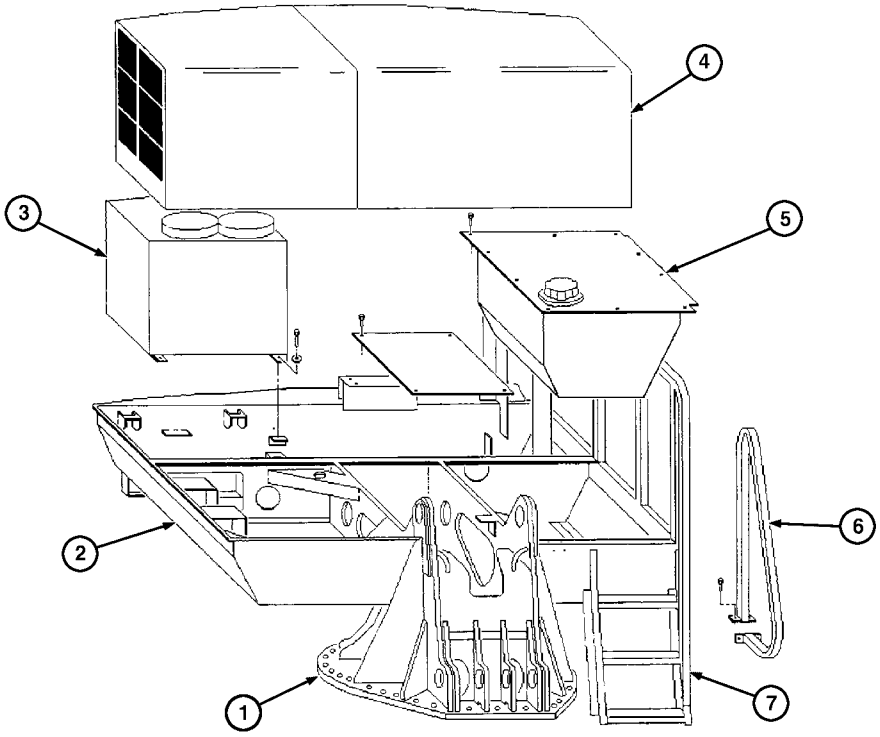
1. Main Boom
2. Cab
3. Hydraulic Tank Enclosure
4. Engine Enclosure
5. Upper frame (Turntable)
6. Swing Bearing
7. Lower Frame
8. Main Boom Cylinders
9. Jib Boom Cylinder
10. Stabilizer
11. Heel Bar
12. Jib Boom
13. Grapple

2. Lower Frame Component Locator



1. Stabilizer Pad
2. Stabilizer
3. Lower Frame (Base)
4. Swing Bearing
5. Stabilizer Cylinder Cover
6. Access Steps
7. Upper Stabilizer Cylinder pin
8. Stabilizer Pivot Pin
9. Lower Stabilizer Cylinder Pin
10. Stabilizer Pad Pivot Pin

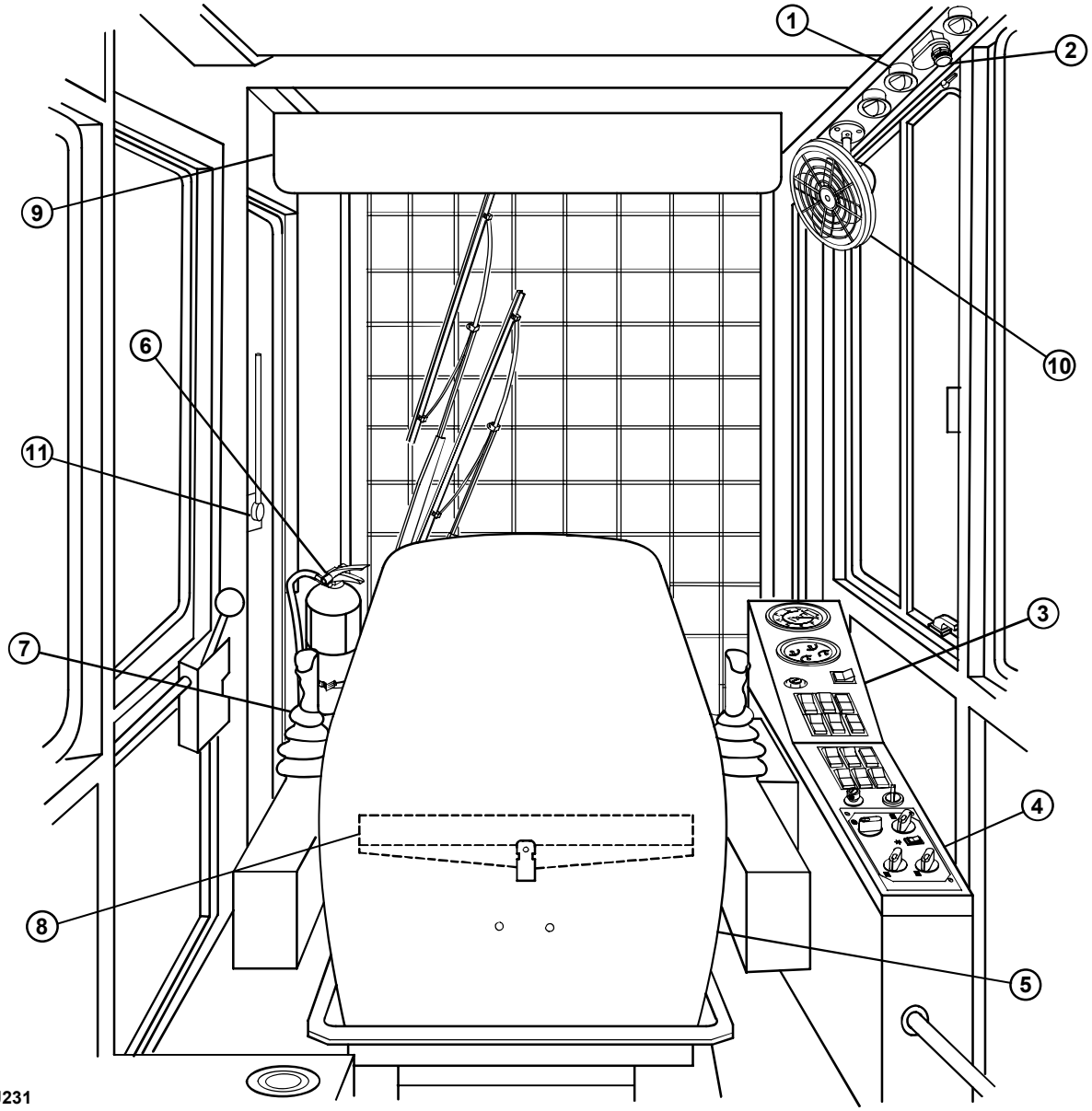
3. Upper Frame Component Locator



TJ302

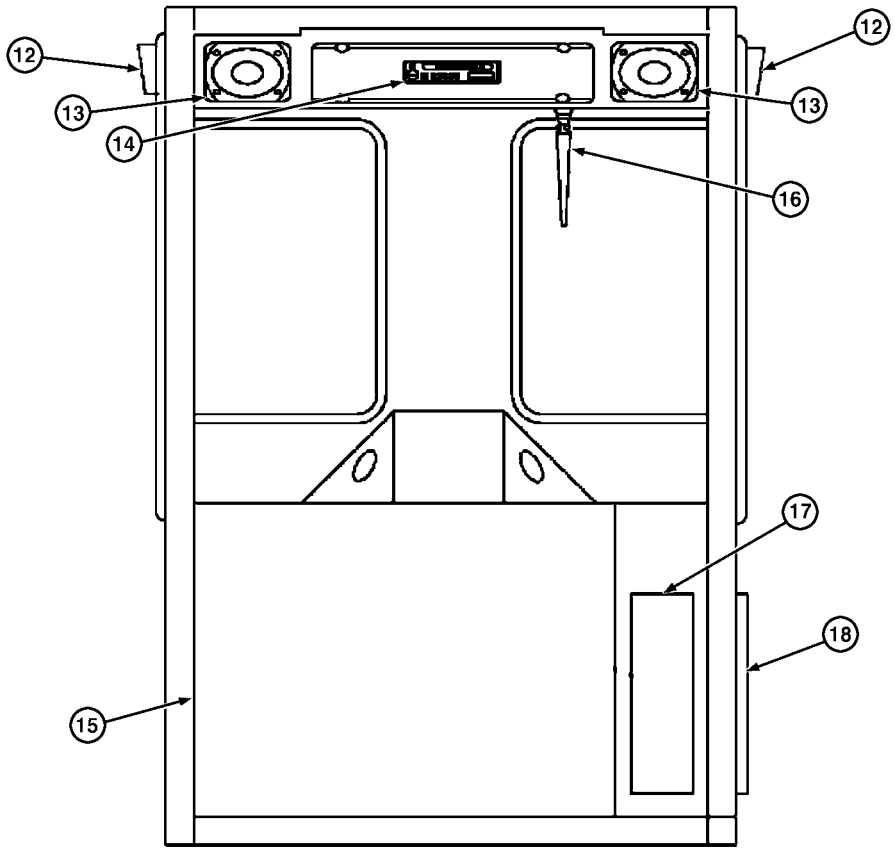
1. Turntable Pedestal
2. Upper Frame
3. Hydraulic Tank
4. Engine Compartment Enclosure
5. Fuel Tank
6. Handrail
7. Access Steps

4. Cab Component Locator



1. Heater/Air Conditioner Vents
2. Interior Cab Light
3. Engine Gage Panel
4. Main Instrument Panel
5. Operator's Seat
6. Fire Extinguisher
7. Joystick Control (2 used)
8. Swing Control Pedal
9. Sun Visor
10. Air Circulation Fan
11. Pilot Shutoff Whisker

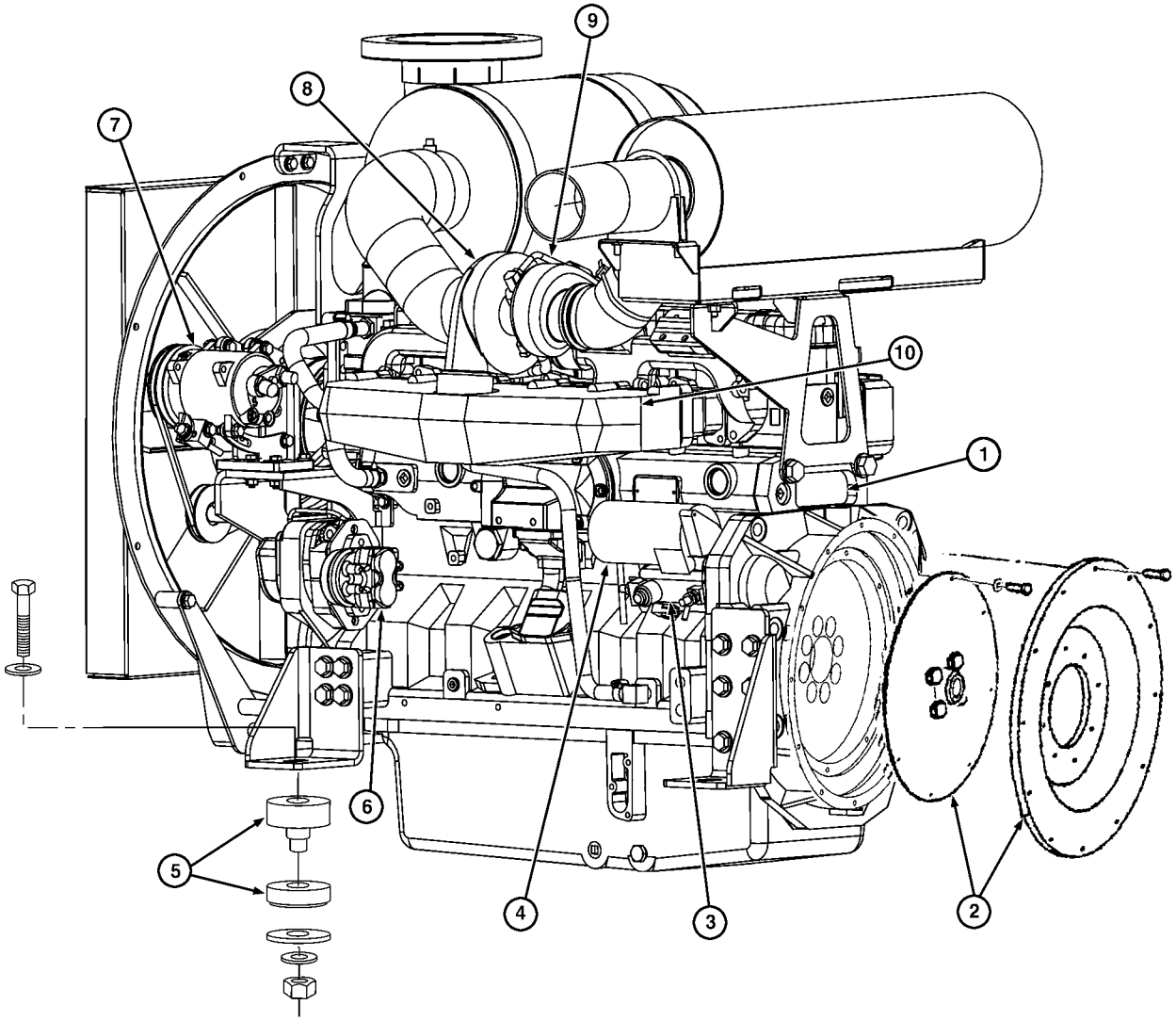
4. Cab Component Locator



TJ230

12. Work Light (6 used)
13. Speaker (2 used)
14. AM/FM Radio/Cassette Player (Option)
15. Air Conditioner/Heater Unit
16. Antenna
17. Cab Air Recirculate Intake
18. Outside Air Intake

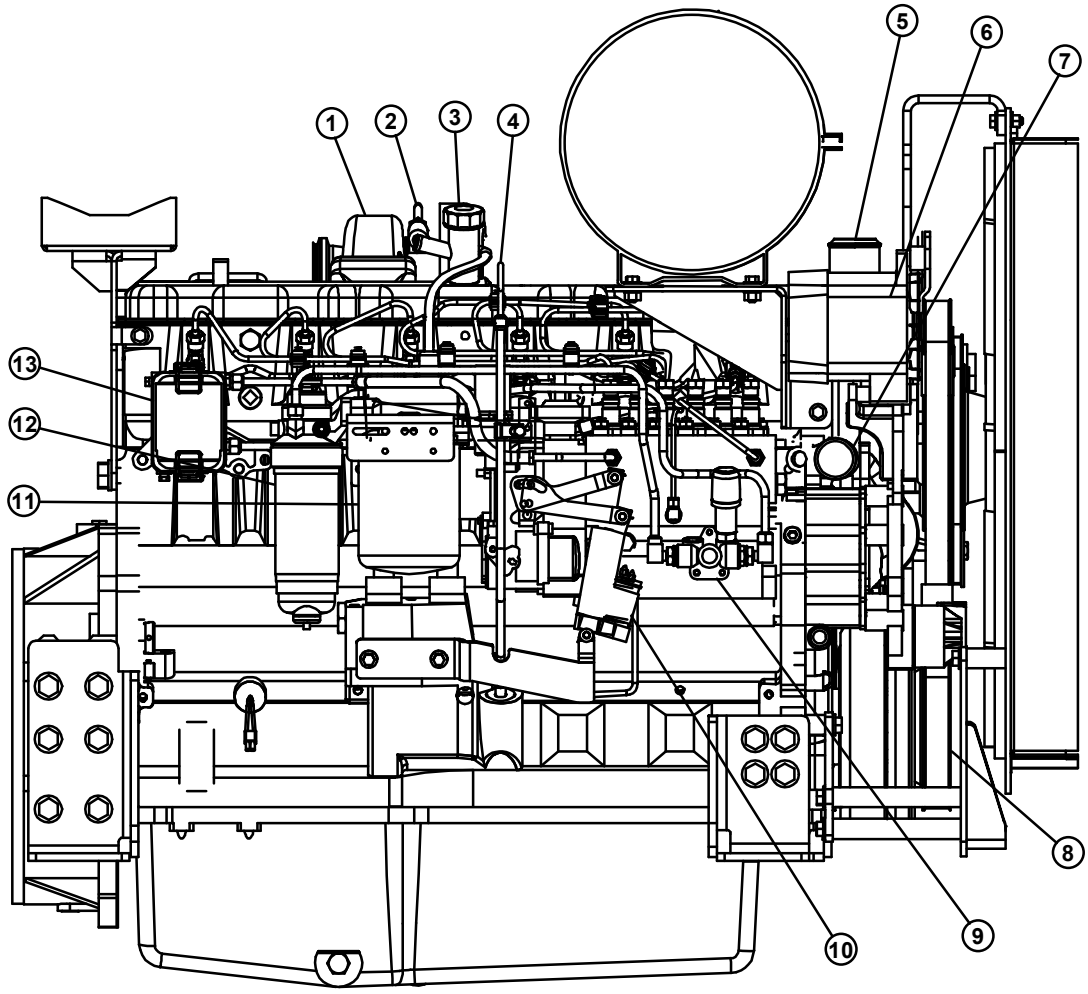
5. Engine Component Locator



TJ220

1. Engine, John Deere 8.1 L
2. Drive Coupling
3. Starter Solenoid
4. Starter Motor
5. Engine Mount
6. Pilot Pump
7. Air Conditioner Compressor
8. Turbocharger
9. Turbocharger Lubrication Line
10. Aftercooler

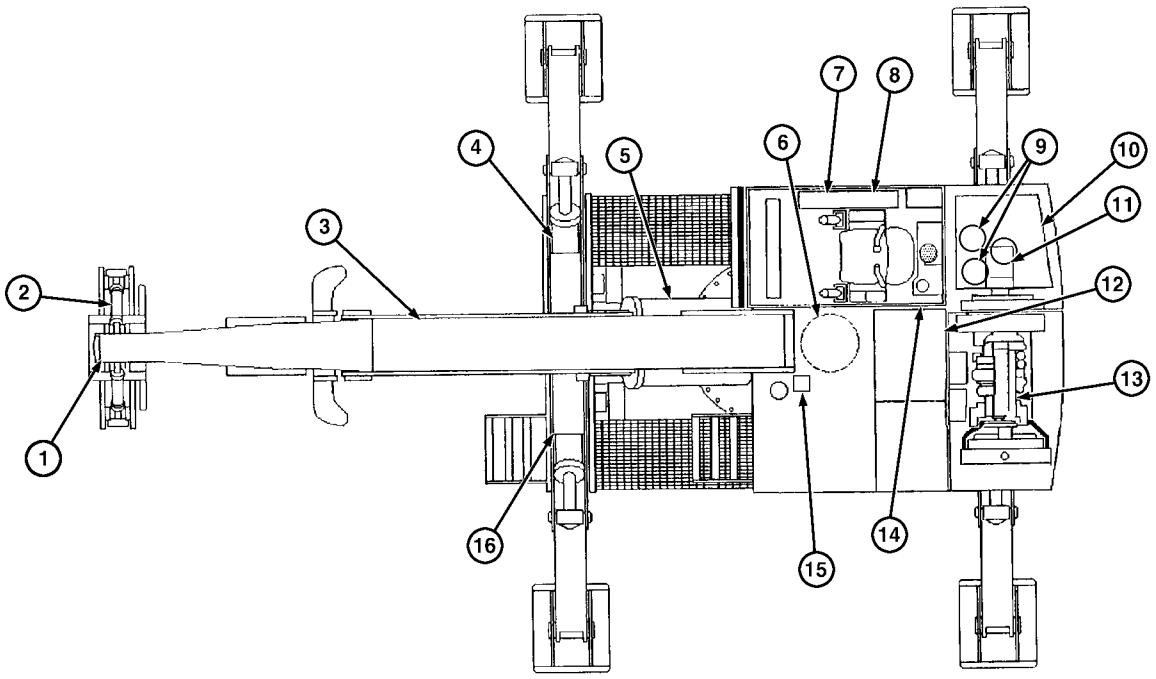
5. Engine Component Locator



TJ219

1. Turbocharger
2. Turbocharger Lubrication Line
3. Oil Fill Cap
4. Oil Dipstick
5. Coolant Outlet
6. Alternator
7. Coolant Inlet
8. Crankshaft Hub
9. Fuel Supply Pump
10. Trottle Actuator
11. Oil Filter
12. Primary Fuel Filter/Water Separator
13. Fuel Filter

6. Hydraulic Component Locator



TJ229

1. Grapple Rotator
2. Grapple Open/close Cylinder
3. Jib Boom Cylinder
4. Stabilizer Cylinder
5. Main Boom Cylinders (2 used)
6. Swing Motor (w/anti-cavitation and crossover relief valves)
7. Jib Boom Control Valve
8. Main Boom Control Valve
9. Hydraulic Return Filters
10. Hydraulic Tank
11. Main Pump
12. Swing Control Valve
13. Pilot Pump
14. Lockout Valve
15. Block Valve
16. Stabilizer Cylinder Lock Valve

0070 Transporting the Log Loader

1. Transporting the Log Loader

See the Operator's Manual for procedures to transport the Log Loader.

IMPORTANT: This equipment is for OFF ROAD USE ONLY and is not intended for extended on-road use at speed.

IMPORTANT: Use chains or suitable straps to secure the booms, heel and grapple to a support cradle or grapple carrier as required during transport.

⚠ **CAUTION: Careless or inappropriate preparation of the loader for transport can result in accidents causing personal injury and equipment damage.**

When transporting this equipment to alternative job sites, move this equipment ONLY in accordance with federal, state, and local regulations.

Regardless of the equipment configuration, height requirements MUST NOT exceed specified maximums.

1. Transporting the Log Loader

BEFORE attempting to transport this equipment:

- Familiarize yourself with the actual dimensions of the equipment.
- Familiarize yourself with the planned transportation route and clearances on any overhanging obstructions.
- Familiarize yourself with road conditions on your planned transportation route.
- Familiarize yourself with posted speed recommendations for your transportation route and DO NOT EXCEED THEM!
- Close all doors, engine covers, and hydraulic valves.
- Verify that the transport trailer's tires are properly inflated.
- Verify that the transport trailer's air brake system is properly connected and fully operational.
- Properly secure all attachments, tools and other equipment.
- Verify that all clearance, brake, turn and tail lights are operational.
- Verify that the key has been removed from the control panel ignition switch.

0080 Repairs

1. General Troubleshooting Techniques

The troubleshooting procedures provided in the sections describe some problems that can be experienced with the various components or systems. While every effort has been made to list the most likely sources of problems, no guarantee of completeness is offered. Some causes produce more than one symptom or problem. The possible causes are arranged from the simplest, most likely to occur to the more complex, least likely to occur. In every instance a systematic approach to diagnostics is essential.

- Ensure that the correct operating procedure is being followed.
- Identify the problem as completely as possible.
- Check the simplest and obvious causes first.
- The solutions to most problems are simpler and less costly if acted on as soon as a problem is noted.

It may be necessary to periodically check or adjust certain systems or components. See the John Deere 535 Operator's Manual for more information.

See the component manufacturer's service manuals for more detailed information regarding specific components.

2. Welding Instructions

When welding, there are a number of concerns to keep in mind:

Some parts must never be welded. These include the loader fastening bolts, the control valves and any hydraulic pipes.

Some parts must not be welded without specific instructions from the component manufacturer. These include castings and cylinder loops.

Do not weld any other parts to castings, boom ends, cylinder fastening lugs, corners of box girders nor the cab. Do not drill any holes in the cab.

When welding connect the ground wire as close to the welding point as possible. The welding current must never pass through bearings, joints, electrical equipment nor hydraulic systems.

IMPORTANT: Before welding, turn the electrical system Master Switch to OFF and disconnect the battery ground wire.

3. Hydraulic Hoses Inspection and Replacement

All hydraulic lines (hoses) are sized to carry the required flow rates at velocities low enough to eliminate excessive pressure losses and heat generation.

Replacement hoses should not be a smaller diameter. They must be of a pressure rating equal to the one being replaced.

Correct hose length and routing is essential to ensure performance and hose life. When replacing hoses ensure that the type of hose and fittings and the length of hose are exactly the same as those being replaced.

Kinked, stretched, twisted or pinched hoses will not provide good performance or a long service life.

4. Inspection Check Lists

John Deere

535 Log Loaders

Machine Model	Serial Number

Dealer _____ Address _____ Dealer Code _____

Owner _____ Address _____
Street/Route No. City/Town State/Province Zip Code

Machine Hours _____ Into Service Date _____
Month Day Year

Record the following Serial Numbers

Engine _____
Main Pump _____
Pilot Motor _____
Swing Motor _____
Cab _____

Grapple _____
Main Control Valve _____
Jib Control Valve _____
Swing Bearing _____
Swing Gearbox _____

PLEASE MARK [X] FOR INSPECTION BEING REPORTED
Important: All information must be completed to validate the warranty on the unit identified herein.

Check/Add as Reqired [ ]
1. Engine Oil [ ]
2. Engine Coolant [ ]
3. Hydraulic Oil [ ]
4. Swing Gearbox Oil [ ]
5. Windshield Washer Fluid [ ]

Inspect/Lubricate as Required
6. Boom Pins and Bushings [ ]
7. Grapple Pins and Bushings [ ]
8. Cylinder pins and Bushings [ ]
9. Stabilizer Pins and Bushings [ ]
10. Swing Bearing [ ]
11. Swing Brg and Pinion Teeth [ ]

Check/Adjustment as Required
12. Eng. Throttle/Stop Linkage [ ]
13. Engine 'V' Belt Tension [ ]
14. Fan/Shroud Clearance [ ]

Check for Leaks at Op Temp [ ]
Hydraulic System [ ]
15. Suction Hoses and Fittings [ ]
16. Hyd Lines/Hoses/Fittings [ ]
17. Hyd Pump/Motor/Filters [ ]
18. Oil Cooler & Fittings [ ]
19. Cylinders & Fittings [ ]

Engine:
20. Oil Filter [ ]
21. Cooling System [ ]
22. Fuel Lines & Filters [ ]
23. Air Intake System [ ]
24. Exhaust System [ ]
25. Coolant Filter [ ]

Check Welding & Workmanship
26. Base Frame [ ]
27. Stabilizers [ ]
28. Turntable & Upper [ ]
29. Booms [ ]
30. Cab [ ]

Check Safety Equipment Installed & Operational
31. Fire Extinguisher [ ]
32. Seat Belts [ ]
33. Horn [ ]
34. Decals [ ]

Check Torque:
35. Engine Mounting Bolts [ ]
36. Pump/Motor Mounting Bolts [ ]
37. Cab mounting Bolts [ ]
38. Radiator Mounting Bolts [ ]
39. All Drain Plugs [ ]
40. Boom Cyl Pins, Bolts, Nuts [ ]
41. Swing Bearing Bolts [ ]
42. Swing Reducer Bolts [ ]
43. Swivel Mounting Bolts [ ]

Miscellaneous:
44. Electrical Wiring & Connections [ ]
45. Heater/Air Conditioner Operation [ ]
46. Recirculation Fan [ ]
47. Lights [ ]
48. Windshield Wiper & Washer [ ]
49. Horn [ ]
50. Any Loose Bolts, Leaks, Abnormalities [ ]

TJ228

4. Inspection Check Lists

John Deere

Inspection Checklist - Page 2 of 2

535 Log Loaders

Machine Model	Serial Number

Machine Hours _____

RECORD THE INFORMATION BELOW:

Engine Operating Temperature: _____

Engine Oil Pressure (Hot) at Idle: _____

Engine RPM (Max. No Load): _____

Engine Coolant Antifreeze For: _____

Hydraulic Oil Temperature: _____

Battery Voltage: _____

Electrolyte Specific Gravity: _____

Remarks:

Hydraulic Valve Settings:	Main	Work Ports
Main Boom Relief:	_____	_____
Jib Boom Relief:	_____	_____
Swing Circuit Relief:	_____	_____
Stabilizer Relief:	_____	
Pilot Pump Relief:	_____	

Dealer Representitive Signature _____

Date _____

TJ227

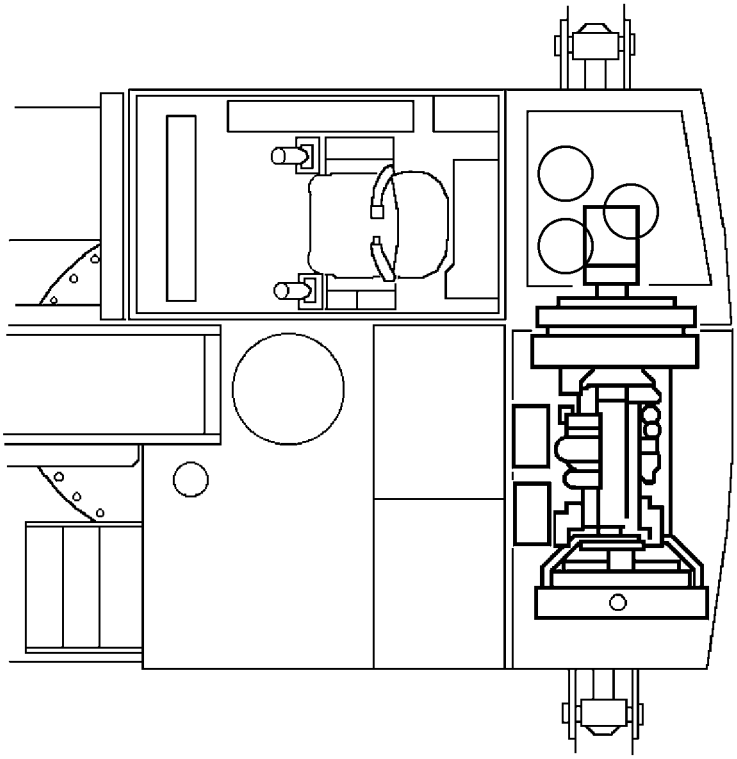
5. Extended Storage

The following steps must be taken whenever the machine is is to be stored or removed from service for an extended period of time.

- Scrupulously clean the entire unit.
- Seal any exposed hydraulic lines.
- Lubricate all fittings.
- Fill the fuel tank.
- Top-off the hydraulic reservoir.
- Protect exposed cylinder rods with a weather retardant coating.
- Protect the unit to minimize weather damage (indoor storage, tarps, etc.).

1000 Power Unit

1. Description and Operation



TJ226

The primary source of power for the machine is a turbocharged and aftercooled, 8.1 liter six cylinder John Deere engine. The engine is mounted in the engine compartment enclosure at the left rear corner of the upper frame.

Engine output drives the main pump providing hydraulic flow for machine functions.

The air conditioning compressor and alternator are belt driven from the engine crankshaft hub.

The power unit as a group includes the engine, the main pump drive coupling, the fuel system, the radiator and cooling system, the air intake system and the exhaust system.

1. Description and Operation

See Section 1100, Engine, and Section 9800, General Machine Specifications, for engine specifications.

See Section 1100, Engine, for information regarding engine troubleshooting.

See Section 1300, Engine Mounting, for procedures replace engine mounts and procedures to remove and install the engine.

See Section 1400, Fuel System, for information on the fuel lines, level sensor and fuel/water separator and for procedures to remove and install the fuel tank.

See Section 1500, Cooling System for procedures service the cooling system and to remove and install the radiator.

See Section 1700, Air Intake System, for information on the air cleaner.

See Section 1800, Exhaust System, for procedures to remove and install the muffler.

ALSO:

See Section 2000, Hydraulics, and Section 2940, Filler and Tilt Pumps, for information on the engine enclosure tilt system.

See Section 2130, Pilot Pump, for information on the pilot pump.

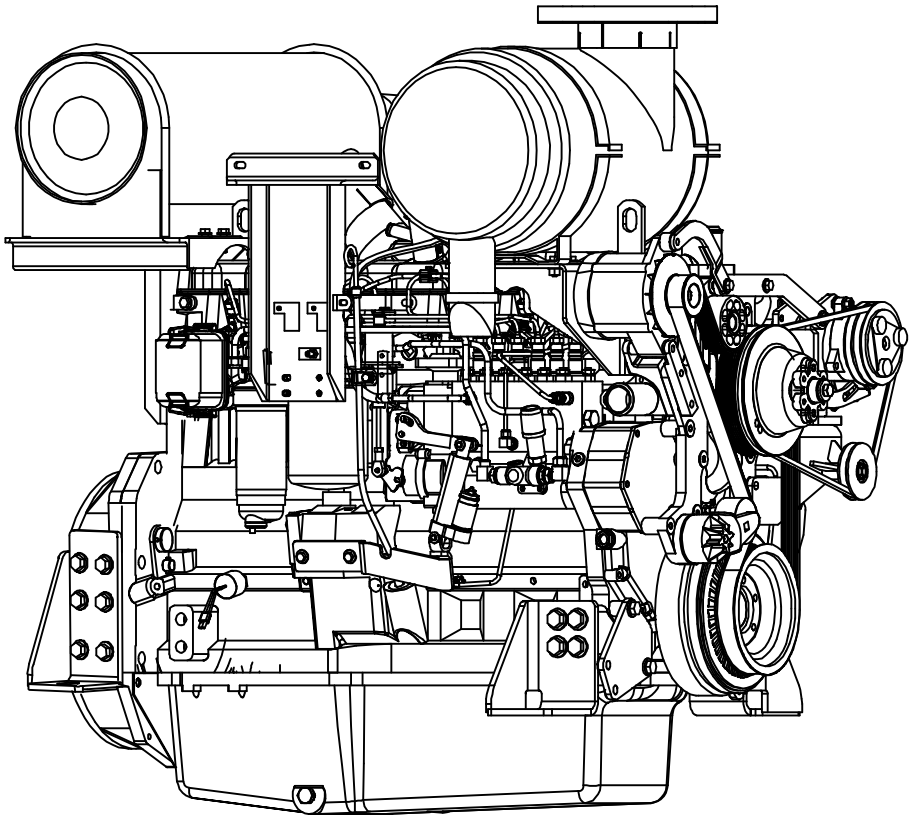
See Section 2950, Hydraulic Cooling, for information on the oil cooler.

See Section 5500, Heater/Air Conditioner Unit, for information on the A/C compressor and condenser and the cab heater hose arrangement.

1100 Engine

1. Description and Operation

1.1 General



TJ206

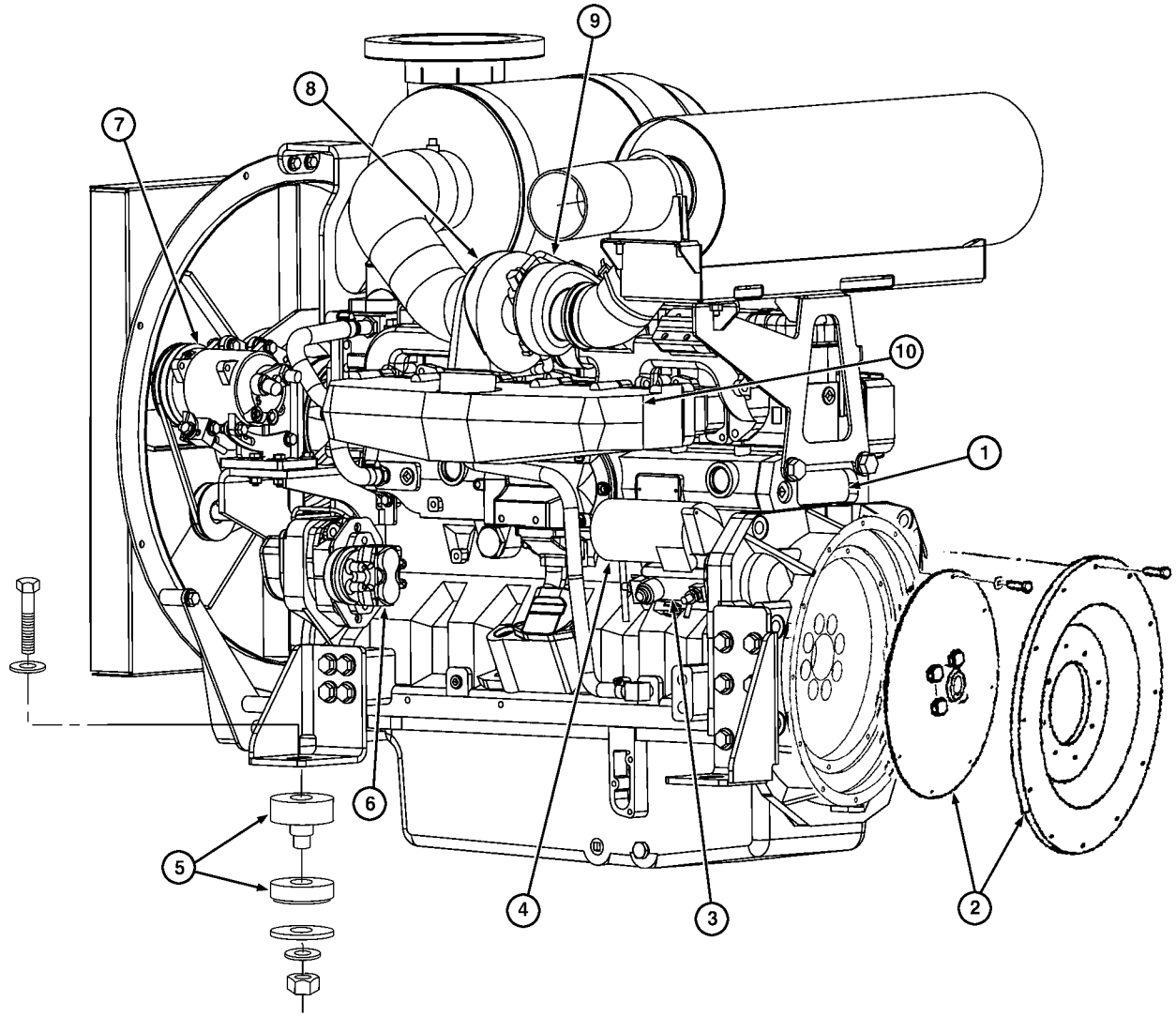
The primary source of power for the machine is a turbocharged and aftercooled, 8.1 liter six cylinder John Deere engine. The engine is mounted in the engine compartment enclosure behind the operator cab.

Consult the Operator's Manual for operation and maintenance procedures.

Consult the John Deere Component Technical Manual CTM86, for detailed procedures to service and repair the engine.

1. Description and Operation

1.1 General

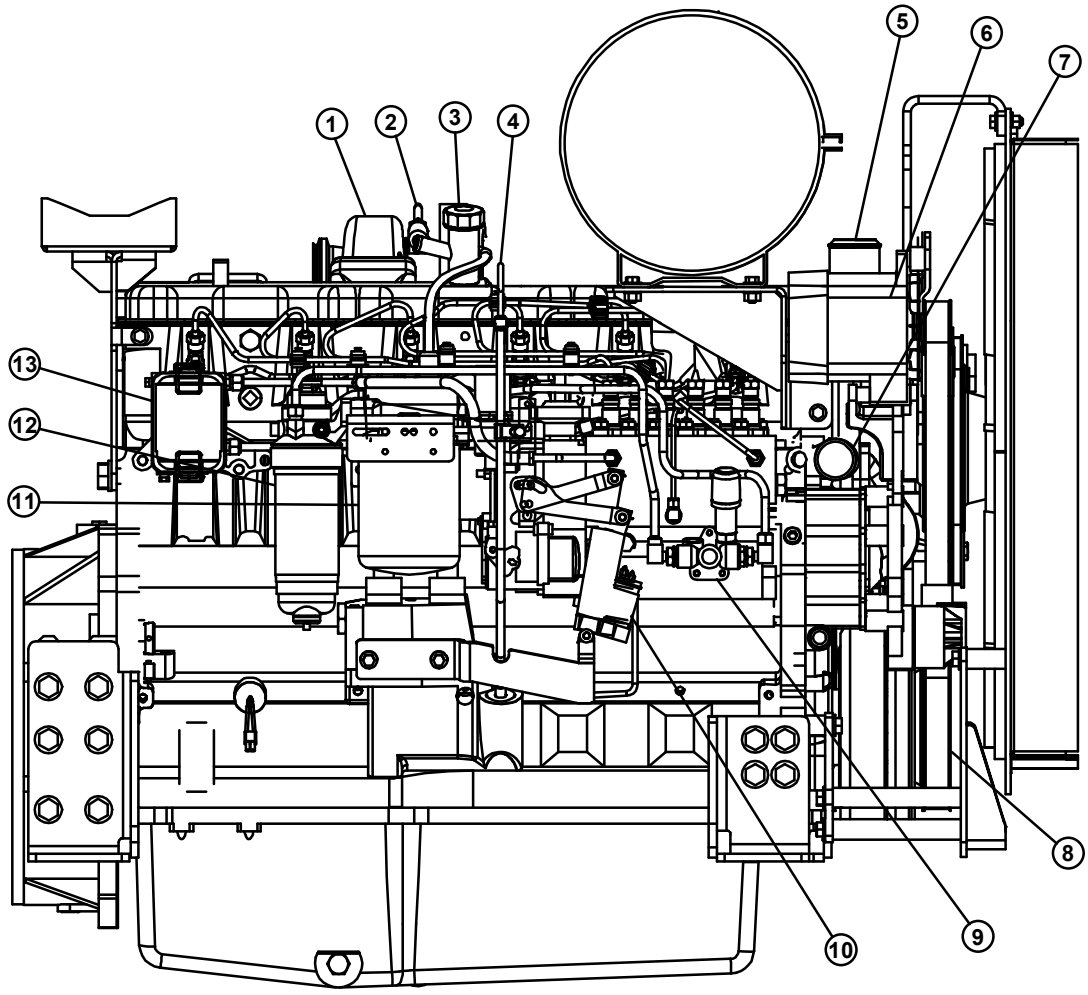


TJ220

1. Engine, John Deere 8.1 L
2. Drive Coupling
3. Starter Solenoid
4. Starter Motor
5. Engine Mount
6. Pilot Pump
7. Air Conditioner Compressor
8. Turbocharger
9. Turbocharger Lubrication Line
10. Aftercooler

1. Description and Operation

1.1 General

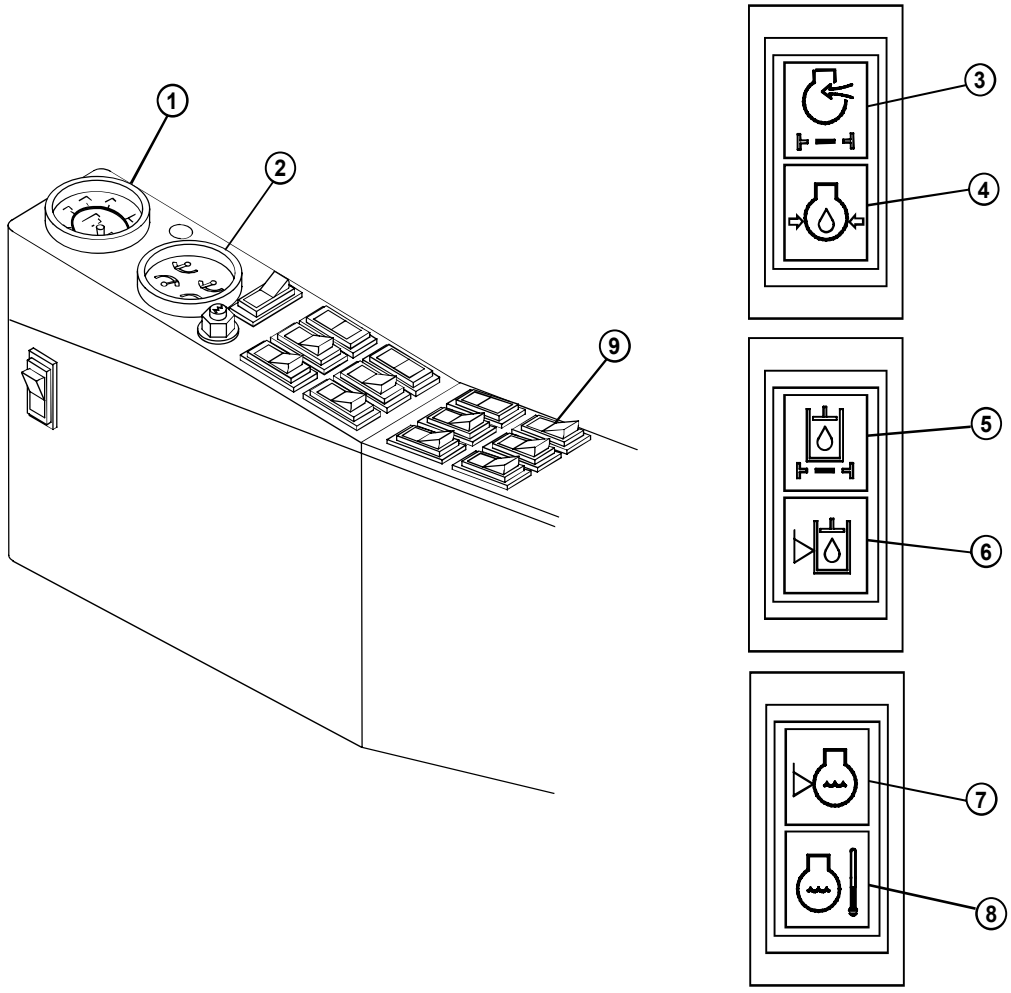


TJ219

1. Turbocharger
2. Turbocharger Lubrication Line
3. Oil Fill Cap
4. Oil Dipstick
5. Coolant Outlet
6. Alternator
7. Coolant Inlet
8. Crankshaft Hub
9. Fuel Supply Pump
10. Throttle Actuator
11. Oil Filter
12. Primary Fuel Filter/Water Separator
13. Fuel Filter

1. Description and Operation

1.2 Gauges and Warning Indicators



TJ225

1. Tachometer and Hourmeter Gauge
2. Engine Temperature, Voltmeter, Oil Pressure and Fuel Level Gauges
3. Air Filter Restriction Indicator
4. Low Engine Oil Pressure Indicator
5. Hydraulic Oil Filter Bypass Indicator
6. Low Hydraulic Oil Level Warning Indicator
7. Low Engine Coolant Level Warning Indicator
8. High Engine Coolant Temperature Indicator
9. Alarm Shutoff/Lights Check Switch

A number of engine conditions are indicated on gauges and warning lights on the console in the cab.

1. Description and Operation

1.2 Gauges and Warning Indicators

Indicators

Six indicator lamps are located on the instrument panel, to the operator's right in the cab. When illuminated, these lamps indicate that critical limits have been reached for the following:

- Hydraulic oil filter restriction
- Air filter restriction
- High engine coolant temperature
- Low engine oil pressure
- Low engine coolant level
- Low hydraulic oil level

A central alarm buzzer will sound when any of the warning lamps are lit.

Gauges

With the engine idling and at normal operating temperature, readings should be as follows:

Tachometer	850 rpm
Engine Coolant Temperature	84°C (202°F)
Oil Pressure	30 psi or minimum
Voltmeter	12 to 14 Volts

IMPORTANT: During full-load operation the indicated oil pressure must be in the 40 to 70 psi range. Pressure below this range indicates the possibility of severe equipment damage.

1. Description and Operation

1.3 Engine Enclosure Raising and Lowering

CAUTION: Whenever engine compartment is open, always position engine enclosure prop rod in the locked position. Failure to do so can lead to personal injury or death.

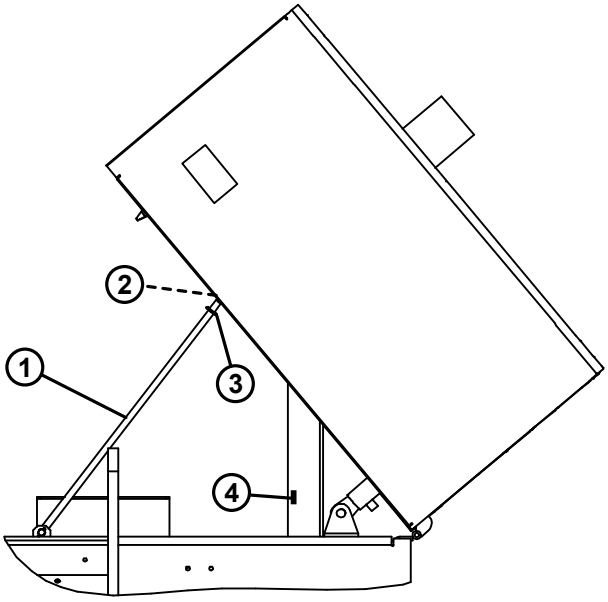
NOTE: Engine enclosure can be raised and lowered by using either the engine enclosure raise/lower switch located on the side of the operator's control panel or the manual pump lever located on the engine enclosure control valve.

1. Raise engine enclosure.
2. Insert prop rod (1) into oval slot (2) located on engine enclosure hood bottom frame.

NOTE: Ensure that prop rod safety stop (3) is seated into oval slot on engine enclosure frame.

IMPORTANT: Damage to the engine enclosure will occur if hood is lowered with prop rod not properly stowed.

3. Prior to lowering engine enclosure, stow prop rod in support storage bracket (4) located on radiator frame.



VIEW LOOKING AFT

TJ289

1. Prop Rod
2. Oval Slot
3. Safety Stop
4. Storage Bracket

1. Description and Operation

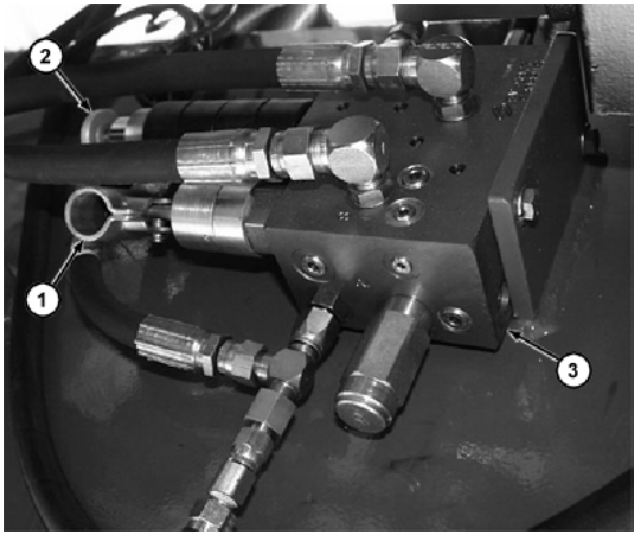
1.4 Engine Enclosure Hand Pump Operation

CAUTION: Whenever engine compartment is open, always position engine enclosure prop rod in the locked position. Failure to do so can lead to personal injury or death.

NOTE: In the event of a non-operational engine or dead batteries, the engine enclosure can be raised and lowered by using the manual pump lever located on the engine enclosure control valve.

NOTE: Jack handle is normally located behind the operator's seat in the cab.

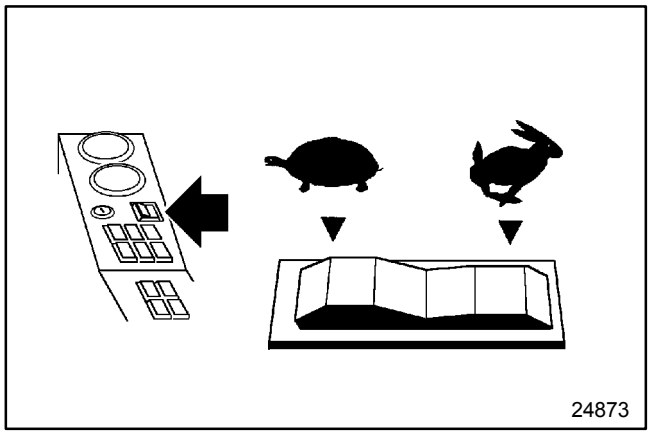
1. Insert jack handle into manual pump lever (1) mechanism on engine enclosure control valve (3).
2. To raise engine enclosure, push in and turn clockwise knurled knob (2) located on engine enclosure control valve solenoid.
3. Pump jack handle to raise enclosure.
4. To lower engine enclosure, pull out and hold knurled knob (2) while continuing to pump jack handle.
5. Remove and properly stow jack handle.



1. Pump Lever
2. Knurled Knob
3. Control Valve

1. Description and Operation

1.5 Engine Throttle



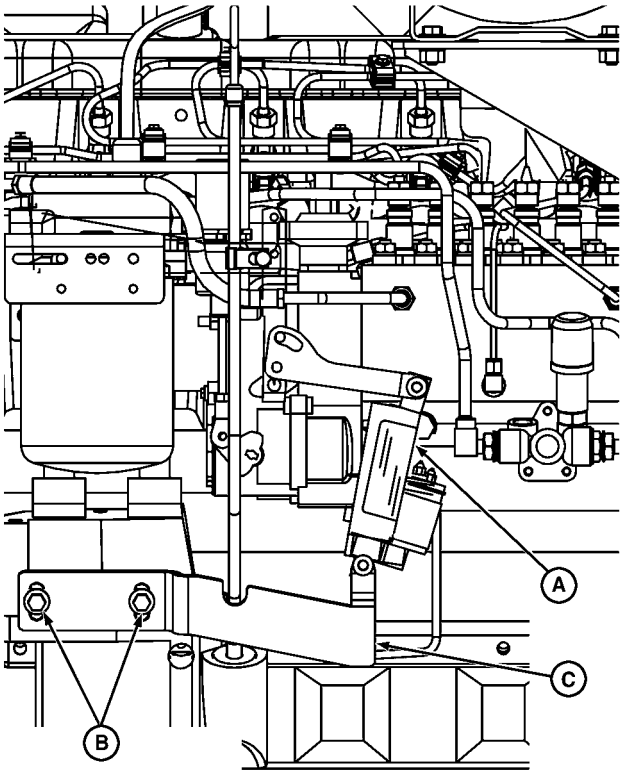
The throttle control is a dual-action, spring-return, rocker switch located on the instrument panel. The switch is used for the adjustment and maintenance of engine speed (rpm) during loader operation.

Press right side to increase engine speed (rabbit).

Press left side to decrease engine speed (turtle).

Release when the desired engine speed is attained.

See Section 3000, Electrical, for details on the wiring.



TJ218

An electrically operated actuator (A) mounted on right side of engine block controls throttle linkage movement.

Adjust throttle by loosening bracket mounting hardware (B) and re-positioning actuator bracket (C).

Throttle actuator must be allowed to extend fully to the end of its travel.

See engine specifications for correct idling rpm.