Operator's Manual

To the Purchaser

This new engine was carefully designed and manufactured to give years of dependable service. To keep it running efficiently, read the instructions in this operator's manual. Each section is clearly identified so you can easily find the information you need—whether it is operation, lubrication, or service.

Read the Contents to learn where each section is located. Use the alphabetical index for fast reference.

Throughout this manual, "right-hand" and "left-hand" sides are determined by facing the drive end (rear) of the engine.

Record your engine serial number and accessory codes in the spaces indicated on page 1. Your dealer needs this information to give you prompt, efficient service when you order parts. If your engine requires replacement parts, see your John Deere dealer. John Deere dealers stock factory original parts and have the specialized equipment and personnel with technical knowledge to provide skilled and efficient workmanship on your engine.

The warranty on this engine appears on your copy of the engine registration which you received from your dealer when you purchased the unit.

⚠ This safety alert symbol indicates important safety messages in this manual. When you see this symbol, be alert to the possibility of personal injury and carefully read the message that follows.

Your operator's manual contains SI Metric equivalents which follow immediately after the U.S. customary units of measure.

Contents

JOHN DEERE SERVICE LITERATURE AVAILABLE...

To order these publications, fill out the form below and mail it with payment to the address given. Make checks payable to Deere & Co. Service Publications. Please allow three weeks for delivery. Prices include handling, taxes and postage to anywhere in the U.S.A. and Canada.

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Please send to. . .

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Title	Order No.	Qty.	Price Each
Parts Catalogs - 3164D	PC-1416		$ 3.00
4219D	PC-1417		3.00
4276D	PC-1469		1.50
6329D	PC-1418		3.00
6414D	PC-1471		3.00
Operator's Manual Series 300 OEM Engines	OM-R63363		$ 1.20

NOTE: If you want manuals or catalogs for equipment not shown on this list, list the model number, serial number and name of the equipment below.

_____

_____

FOS Manual - Hydraulics	FOS-10B		$ 5.75
FOS Manual - Electrical Systems	FOS-20B		6.85
FOS Manual - Engines	FOS-30B		7.45
FOS Manual - Power Trains	FOS-40B		5.75
FOUR FOS MANUALS (above)	FOS-90 Set		22.95
FOS Manual - Shop Tools	FOS-51B		2.35
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FOS Manual - Bearings and Seals	FOS-54B		3.25
FOS Manual - Tires and Tracks	FOS-55B		3.25
FOS Manual - Mowing and Spraying Equipment	FOS-56B		2.35
FOS Manual - Air Conditioning	FOS-57B		4.15
FOS Manual - Fuels, Lubricants and Coolants	FOS-58B		3.25
FOS Manual - Fiber Glass	FOS-59B		2.35
FOS Manual - Fasteners	FOS-60B		3.25
SET OF TEN FOS MANUALS FOS-51B, 52B, 53B, 54B, 55B, 56B, 57B, 58B, 59B and 60B)	FOS-70 Set		25.95
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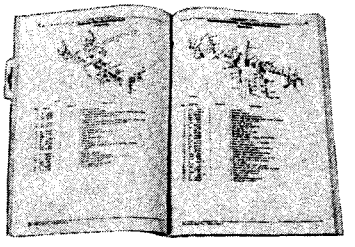
Check or money order in U.S. dollars enclosed..... Total _____
(Do not send cash or stamps)

Prices subject to change without notice.

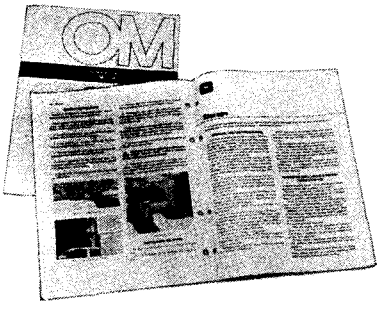
SP-220 Litho in U.S.A. MAR-75

PARTS CATALOG



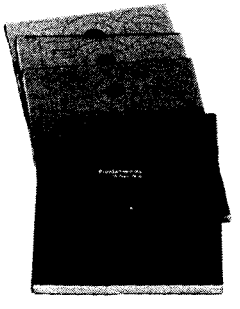
A parts catalog containing exploded view illustrations and lists of all parts is useful when purchasing service parts. Helps identify the correct parts. Useful in assembling and disassembling.

OPERATOR'S MANUAL



An extra copy of the operator's manual may be important if the copy furnished with your machine is misplaced.

FOS MANUALS



Fundamentals of Service manuals contain basic fundamentals of service and operation. These manuals are applicable to most types and makes of machinery. Each starts with basic theory; covers operation, basic servicing, diagnosis, and testing. They are fully illustrated with plenty of colorful diagrams.

ACCESSORY CODE PLATE

To assist your John Deere dealer in giving you prompt and efficient service, a code plate is attached to your John Deere engine. This code plate will identify parts that are unique to the original equipment manufacturer's application. The basic engine code identifies the engine model. The option code establishes the functional groups. The first two digits identify the functional group and the last two digits identify the specific option and can be cross-referenced to the proper component in the parts catalog. When in need of parts or service on any of these John Deere components, furnish your John Deere dealer with the basic engine type number, option code numbers, and engine serial number.

Since the last two digits of the Functional Group Code numbers vary with different engines, a complete listing is not given here. An example of a complete code number would be:

1102 Rocker Arm Cover, No Filler
1103 Rocker Arm Cover, Rear Oil Filler

Accessories not sold by John Deere will be indicated on the code plate with the designation "00". For example:

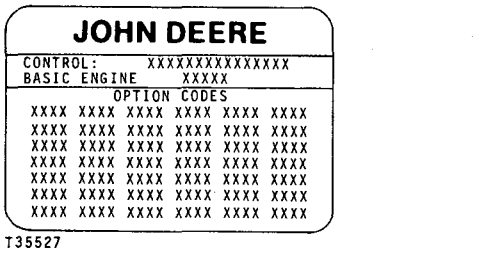
3000 No Starting Motor

The original equipment manufacturer will be responsible for warranty on this category of accessory.

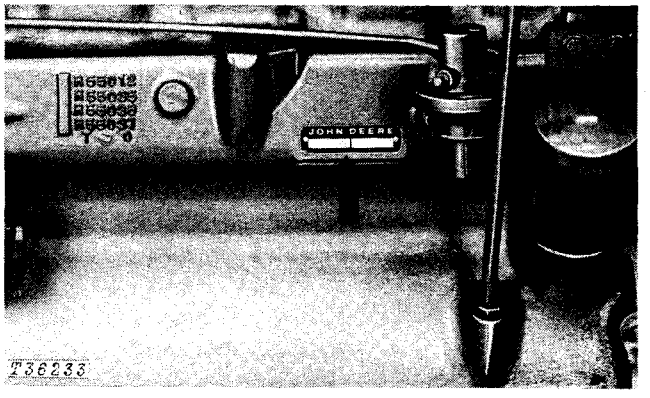
The following list shows only the first two digits of the code numbers which identify the functional groups and will be the same on all engines. Enter the third and fourth digits shown on your engine code plate in the spaces provided below.

Functional Group Codes	Description
11____	Rocker Arm
12____	Oil Filler Cover and Inlet
13____	Crankshaft Pulley
14____	Flywheel Housing
15____	Flywheel
16____	Injection System
17____	Air Intake
18____	Air Cleaner
19____	Oil Pan
20____	Water Pump
21____	Thermostat Cover
22____	Thermostat
23____	Fan Pulley

Functional Group Codes	Description
24____	Fan Belts
25____	Fan
26____	Engine Heater
27____	Radiator
28____	Exhaust System
29____	Vent System
30____	Starting System
31____	Electrical System
32____	Instrumentation
33____	Tachometer
34____	Hour Meter
53____	Sheet Metal
58____	Clutch and PTO



Accessory Code Plate



Engine Type_____Engine Serial No._____

An individual serial number is assigned to each engine. Enter the engine type and serial number in the space provided below the illustration.

Safety Rules

The safety of the operator is a prime consideration in the design of this engine. Guards, shields, and other safety features are built in wherever possible. However, reports on accidents show that careless use of the engine causes a high percentage of accidents. You can avoid many accidents by observing the safety rules on this page. Study these rules carefully and enforce them on the job.

Never leave the engine unattended while it is running.

Turn the radiator cap slowly to relieve pressure before removing it. Add coolant only when the engine is idling or stopped.

It is a good practice to mount a fire extinguisher close to the engine. Be sure that the extinguisher is properly maintained and be familiar with its use.

Always disconnect the battery ground strap before making adjustments on the engine or electrical equipment. This will prevent dangerous sparks which create a fire hazard and may cause harm or damage. Disconnecting the battery also prevents accidental operation of the engine.

Do not operate the engine in a closed garage or shed unless properly ventilated.

Daily remove all trash accumulation from the engine and surrounding area.

Before using booster batteries read the instructions on page 4. If a battery needs recharging, avoid sparks by turning off the charger before connecting or disconnecting the charger.

Escaping fluid under pressure can have sufficient force to penetrate the skin, causing serious personal injury. Before disconnecting lines be sure to relieve all pressure. Before applying pressure to the system, be sure all connections are tight and that lines, pipes and hoses are not damaged. Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, rather than hands, to search for suspected leaks.

If injured by escaping fluid, see a doctor at once. Serious infection or reaction can develop if the proper medical treatment is not administered immediately.

Clothing worn by the operator should be relatively tight and belted. Loose jackets, shirts, sleeves, or other items of clothing should not be permitted because of the danger of catching them in moving parts.

Do not leave the engine running while making adjustments or repairs unless specifically recommended.

Do not oil or grease the engine while it is running.

Provide a first aid kit for use in case of an accident. Use a proper antiseptic on scratches, cuts, and other injuries immediately.

Use caution in handling any type of fuel. Never refuel when the engine is hot or running. Do not smoke while filling the fuel tank or servicing the fuel system.

Keep hands, feet and clothing away from power-driven parts.

Keep hands, floors, and controls free from water, grease and mud to insure non-slip control.

Check for loose electrical connections or faulty wiring.

The engine should be operated only by those who are responsible and delegated to do so.

Walk completely around the engine making sure everything is clear before starting to work.

Do not operate an engine with an unsafe condition. If one is noticed, tag the engine so that other operators will also know it.

Operation

Complete instructions for operating your engine safely and efficiently are given on the following pages. By following these directions carefully, you can be sure that you are taking full advantage of the many features built into your engine.

PRE-STARTING INSPECTION

Perform the following checks before starting the engine for the first time each day:

A. Check the engine crankcase oil level.

B. Check the fuel filter for sediment.

C. Check the radiator coolant level.

D. Inspect the air cleaner; service if necessary.

ENGINE WARM-UP

Warm up engine before operating under full load. Oil will then circulate freely, preventing excessive wear on piston rings, cylinders, and bearings. Do not race or idle the engine during warm-up.

It is good practice to operate the engine under a lighter load and lower speeds than normal for the first 30 minutes.

ENGINE IDLING

Avoid unnecessary engine idling. Prolonged idling may cause the engine coolant temperature to fall below its normal range. This causes crankcase oil dilution due to incomplete fuel combustion, permitting formation of lacquer or gummy deposits on valves, pistons, and piston rings. It also promotes rapid accumulation of engine sludge and unburned fuel in the exhaust system.

When the engine is to remain idle for a considerable length of time, shut off the engine.

BREAK-IN PERIOD

The FIRST 100 hours of operation is designated as the unit break-in period. During this period, warm the engine up thoroughly before operating under full load. Do not race or idle the engine. Operate the unit under a lighter load and lower speeds than normal for the first 30 minutes of daily operation.

Before the unit was shipped from the factory, all bearings and friction surfaces were correctly fitted and lubricated as required. The crankcase was filled with John Deere Torq-Gard Supreme 10W-20 oil.

Check the crankcase oil level frequently during the first 100 hours of operation. If it becomes necessary to add oil during the break-in period, use John Deere Torq-Gard Supreme 10W-20 oil.

ENGINE SPEEDS

The normal engine working range for the Series 300 OEM engines is 1500 to 2500 rpm. Low idle is 800 rpm.

The above instructions do not apply to generator set applications—use the following information:

1. There is no high or low idle. Engine runs at 1800 rpm only.
2. On standby units run at no load for a half hour every two weeks.
3. Break unit in under a load and operate periodically under a load.
4. Cool down under no load for 3 to 5 minutes.

STARTING THE ENGINE

⚠ CAUTION: Never start the engine unless it is safe to do so.

During cold weather, use starting aids as necessary.

Before starting the engine make sure there is a sufficient quantity of fuel in the fuel tank and that the fuel shut-off valve (if available) is open. Do not allow the engine to run out of fuel as this will necessitate bleeding the entire fuel system. It is a good practice to fill the fuel tank at the end of each day's work.

Perform the pre-starting checks. Start the engine by the following procedure:

⚠ CAUTION: Before starting the engine be sure there is plenty of ventilation. Never operate the engine in a closed shed or a garage unless properly ventilated.

1. Turn key switch to "ON" position.

2. Depress starter button. Do not hold button in cranking position for more than 20 seconds at a time. Longer operation may overheat the starter. If the engine does not start the first time, wait 2 minutes before trying again. If the starter button is released before the engine starts, wait until the starter stops turning before depressing the starter button again. This will prevent possible damage to the starter.

3. As soon as the engine starts, release the starter button and adjust the engine speed to approximately half throttle. In cold weather warm engine for 5 minutes by operating engine at half throttle.

It is a good practice to operate the engine under a lighter load and lower speeds than normal for the first 30 minutes.

Cold Weather Starting

Booster Batteries

Starting the engine in cold weather can be made easier by connecting an additional 12-volt battery in parallel with the 12-volt battery or batteries on the engine.

Make sure all electrical switches or accessories are turned off and make the last connection or the first disconnection at some point away from the battery.

Use one jumper cable to connect the positive (+) terminal of the booster battery to the positive (+) terminal of the battery. Connect one end of the other jumper cable to the negative post of the booster battery and to a good ground away from the battery. Never connect jumper cables to pipes or thin sheet metal.

⚠ CAUTION: Gas given off by batteries is explosive. To avoid injury or battery damage, avoid sparks near the batteries.

IMPORTANT: Reversed polarity booster battery connections will damage the alternator or electrical wiring.

THROTTLE

Use the throttle to select any of the variable engine speeds between slow idle and fast isle.

STOPPING THE ENGINE

Idle engine for a few minutes to cool the engine. Sudden stopping of an engine may cause overheating by stopping the flow of oil for cooling and lubrication.

After idling engine, turn key switch off and remove key to prevent tampering. Removing the key also prevents the switch from being accidentally left in the "ON" or the "ACCESSORY" position causing battery discharge.

If the engine stops when operating under load, immediately restart the engine to prevent overheating caused by stopping the flow of oil for engine cooling and lubrication.

Fuels and Lubricants

The quality of fuel used is important in obtaining dependable performance and satisfactory engine life. Fuels must be clean, completely distilled, well refined, and non-corrosive to fuel system parts. Use fuel of known quality obtained from a reputable supplier.

FUEL SPECIFICATIONS

Use Grade No. 1-D or No. 2-D fuel, as defined by ASTM Designation D975 for diesel fuels. The Grade No. 2-D fuel is heavier and produces more work per gallon.

Under most conditions, Grade No. 2-D fuel should be used at ambient temperatures above freezing. Grade No. 1-D fuel should be used at ambient temperatures below freezing and is recommended for all temperatures at altitudes above 5000 feet (1500 m).

Use fuel having less than 1.0 percent sulfur, preferably less than 0.5 percent.

For maximum filter life, sediment and water should not exceed 0.10 percent.

To maintain fuel delivery during cold weather operation, use Grade No. 1-D diesel fuel with a cloud point at least 10°F (6°C) below lowest ambient air temperature.

The cetane number should be 40 minimum. Low atmospheric temperature, as well as high altitude operation, may require use of a fuel with a high cetane number.

In some conditions, the interval between service on the fuel system may be increased by adding John Deere Diesel Fuel Conditioner to the fuel.

STORING FUELS

The importance of proper fuel storage cannot be stressed too highly. Many engine difficulties can be traced to dirty fuel and fuel that has been in storage too long. Keep dirt, scale, water, and other foreign matter out of the fuel. Avoid storing fuel for a long period of time.

Store fuel in a convenient place outside of buildings.

FILLING THE FUEL TANK

Fill the tank at the end of each day's operation to prevent moisture from collecting and freezing in the fuel system.

LUBRICANTS

Effective use of lubricating oils and greases is perhaps the most important step towards low upkeep cost, long engine life, and satisfactory service. Use only lubricants specified in this section; apply them at intervals and according to the instructions in the lubrication and periodic service section.

ENGINE LUBRICATING OILS

X3377N

We recommend John Deere Torq-Gard Supreme engine oil for use in the engine crankcase. This oil is compounded specifically for use in John Deere engines and provides superior lubrication under all conditions. NEVER PUT ADDITIVES IN THE CRANKCASE. Torq-Gard Supreme oil is formulated to provide all the protection your engine needs. Additives could reduce this protection rather than help it.

If oil other than Torq-Gard Supreme is used, it must conform to one of the following specifications for all John Deere engines:

SINGLE VISCOSITY OILS

API Service CD/SD
MIL-L-2104C
Series 3

MULTI-VISCOSITY OILS

API Service CC/SD
MIL-L-46152

Depending on the expected prevailing average daytime temperature for the fill period, use oil viscosity as shown in the following chart.

Air Temperature	John Deere Torq-Gard Oil	Other Oils: Single Viscosity Oil	Other Oils: Multi-Viscosity Oil
Above 32°F (0°C)	SAE 30	SAE 30	Not recommended
−10°F to 32°F (−23°C to 0°C)*	SAE 10W-20	SAE 10W	SAE 10W-30
Below −10°F (−23°C)	SAE 5W-20	SAE 5W	SAE 5W-20

**SAE 5W-20 oil may also be used to insure optimum lubrication at starting, particularly when engine is subjected to −10°F (−23°C) or lower temperatures for several hours.*

Some increase in oil consumption may be expected when SAE 5W-20 or SAE 5W oils are used. Check oil level more frequently.

STORING LUBRICANTS

Your engine can operate at top efficiency only if clean lubricants are used. Use clean containers to handle all lubricants. Store them in an area protected from dust, moisture, and other contamination.

Do not handicap your engine by using inferior or incorrect oil and grease. Use only quality lubricants at the specified intervals.

Lubrication and Periodic Service

Effective lubrication is the most important step toward low upkeep cost, long life, and satisfactory service. Without oil and grease, important working parts of your engine will be damaged in a very short time.

The engine has one of the finest lubricating systems it is possible to design. Do not handicap it by using an oil of doubtful quality. It pays to buy only nationally known brands of oil.

The intervals at which the various working parts should be checked, lubricated, serviced, or adjusted are based on hours of operation.

LUBRICATION AND SERVICE INTERVALS

The lubrication and service periods are: "as required," daily or every 10 hours, every 100 hours, every 200 hours, every 500 hours, every 1000 hours, and every spring and fall. These intervals are based on normal operating conditions. When operating under unusual conditions, such as excessive heat, cold, dust, mud, or water, check and service the engine more frequently.

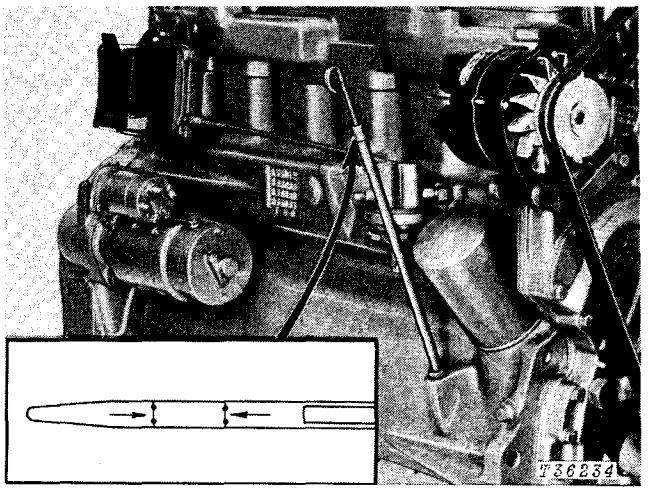
The chart on the following pages is a list of components to be serviced at each interval and the service to be performed. Detailed instructions for performing each service are given on the pages which follow the chart. Each item in the chart is numbered, with the corresponding detailed procedure bearing the same number.

BREAK-IN PERIOD

Before your new engine was shipped from the factory, all bearings and friction surfaces were correctly fitted, and the crankcase was filled with fresh oil.

Break-in oil for new engines is John Deere Torq-Gard Supreme 10W-20 and should remain in use for the first 100 hours of operation.

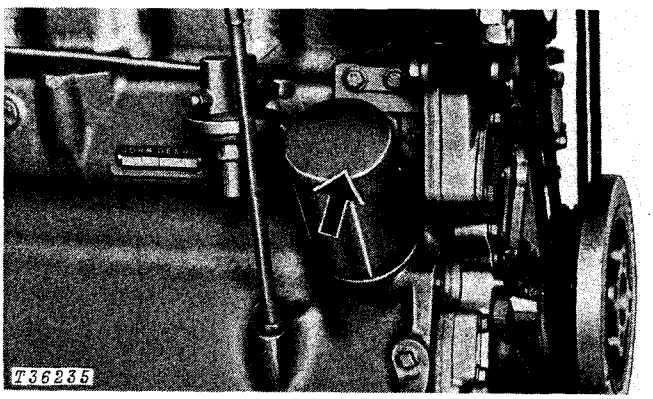
During the break-in period (100 hours), check the crankcase oil level periodically to be sure that an adequate supply is maintained.



Crankcase Dipstick

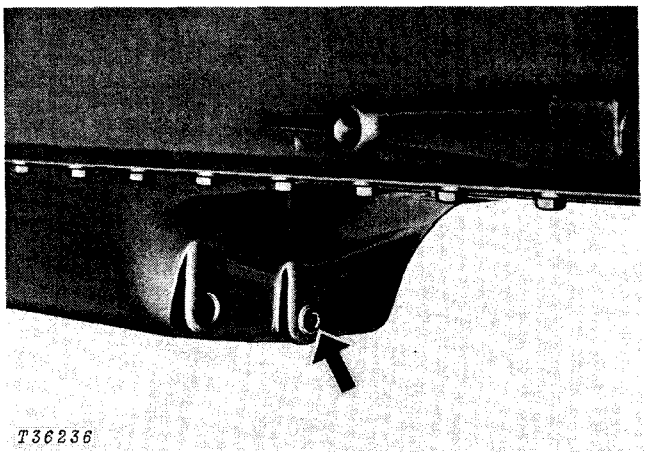
Oil level should be between the two marks on the dipstick as shown. Do not operate engine with oil level below the bottom mark.

NOTE: There is approximately a 2-quart (1.9 l) difference between the bottom mark and the top mark on the dipstick.



Crankcase Filter

At the end of this 100-hour break-in period, drain the crankcase oil, change oil filter and refill the crankcase with the proper viscosity oil. Thereafter change crankcase oil every 100 hours and crankcase oil filter every 200 hours.



Crankcase Drain Plug

CRANKCASE CAPACITY

Engine Model	With Filter Change	Without Filter Change
3164D	6 qts. (5.7 l)	5 qts. (4.8 l)
4219D	6 qts. (5.7 l)	5 qts. (4.8 l)
4276D	9 qts. (8.5 l)	8 qts. (7.6 l)
4276T	14 qts. (13.2 l)	13 qts. (12.4 l)
6329D	12 qts. (11.4 l)	11 qts. (10.4 l)
6414D	18 qts. (17.1 l)	17 qts. (16.1 l)
6414T	18 qts. (17.1 l)	17 qts. (16.1 l)

PERIODIC SERVICE CHART

AS REQUIRED

Item No.	Component	Description of Service	Capacity or Procedure	Description of Lubricant
1	Air cleaner	Clean element when indicator shows red with engine shut off or excessive smoke or loss of power is noted.	.....	.....
2	Radiator	Check coolant level. Remove trash from screen.	Midway between core and filler neck.	.....
3	Fuel filter	Drain any water or dirt deposits.	.....	.....

DAILY OR EVERY 10 HOURS

4	Engine crankcase	Check oil level with dipstick fully inserted.	Between marks on dipstick.	Use recommended viscosity and type of oil.
5	Air cleaner	Empty dust cup.	.....	.....
6	Pre-cleaner	Clean out if necessary.	.....	.....

EVERY 100 HOURS

7	Alternator-fan belt	Check tension.	3/4-inch (17 mm) belt flex with 20 pound (89 N) force.	.....
8	Engine crankcase	Drain and refill	See chart on page 13.	Use oil of recommended viscosity and type.
9	Batteries	Check level of electrolyte in each cell. Check for terminal corrosion.	Fill each cell to bottom of filler neck above plates.	Distilled water.

EVERY 200 HOURS

10	Engine crankcase filter*	Change element.	.....	.....

**Change every 200 hours or yearly whichever occurs first.*

EVERY 500 HOURS

Item No.	Component	Description of Service	Capacity or Procedure	Description of Lubricant
11	Fuel filter*	Replace, if necessary.	.....	Use a John Deere Filter.
12	Engine crankcase vent tube	Remove and clean.	.....	Diesel fuel.
13	Air intake hoses	Check connections for leaks.	.....	.....

EVERY 1000 HOURS

14	Starter	Lubricate wicks. Check brushes for excessive wear.	Saturate wicks.	SAE 10W-20 engine oil.
15	Engine valves	Adjust clearance.	Intake...0.014" (0.36 mm) Exhaust..0.018" (0.46 mm)	.....
16	Engine speeds	Check speeds.	.....	.....

EVERY SPRING AND FALL

17	Cooling system	Drain, flush and refill. Remove any trash on screen.	.....	.....
18	Engine crankcase	Drain and refill. Replace filter.	See chart on page 17.	Use oil of recommended viscosity and type.

ANNUALLY

19	Air cleaner	Replace both elements.	.....	.....

**Change every 500 hours or yearly, whichever occurs first.*

DETAILED PERIODIC SERVICE

AS REQUIRED

1. Dry Air Cleaner

CAUTION: Stop engine before servicing the air cleaner.

Clean primary air cleaner filter element whenever indicator red signal locks in full view. A portion of the red signal may be visible at times during operation (this is normal). Excessive smoke or loss of power may indicate a restriction.

NOTE: Do not remove safety element unless emergency field servicing or replacement is necessary.

When the element must be serviced in the field, tap it on the palm of your hand as a temporary service. It is a good practice to carry with you a spare element (in a sealed plastic bag). Replace the safety element IMMEDIATELY upon returning to the shop after it has been serviced in the field.

Dusty Element

Remove filter element. Tap element on the palm of your hand to remove dust. DO NOT TAP ON A HARD SURFACE.

If tapping element does not remove dust, use compressed air (under 30 psi [2.1 bar]-OSHA Regulations) to clean element. Direct clean dry air up and down the pleats, blowing from the inside to the outside. DO NOT RUPTURE ELEMENT.

Oily or Sooty Element

Soak and wash element in solution of lukewarm water (no hotter than your hand can stand) and R36757 Filter Element Cleaner or an equivalent non-sudsing detergent. Rinse element thoroughly with clean water from hose having maximum water pressure of 40 psi (2.8 bar). Shake excess water from the element and allow it to air dry (usually requires 24 to 72 hours). Do not oven dry or use drying agents. Temperatures above 180° F (82°C) will shorten filter element service life. Protect element from freezing until dry.

IMPORTANT: Never wash element in fuel oil, oil, gasoline, or solvent. Never use compressed air to dry element.

Cleaning Element with Compressed Air

Use the John Deere AR62377 Dry Element Cleaning Gun with compressed air and insert the cleaning gun. Hold the air nozzle near the inside of the perforated sheet metal retainer and squeeze the handle. Air is forced through the element from the inside to the outside. Move the gun up and down the pleats cleaning as much of the dirt from the element as will come free.

After cleaning the element inspect it for damage by placing a bright flashlight inside the filter. Discard any filter that shows the slightest rupture.

Inspect filter element gasket for damage. Replace element if gasket is missing or damaged.

IMPORTANT: Replace primary filter element: (1) if damaged; (2) after one year of service; (3) when filter is not responding to cleaning (indicated by excessive smoke or loss of power).

Thoroughly clean inside of air cleaner body with clean damp cloth. Place element in cleaner body with gasket fins in first and secure with wing nut and gasket washer. Be sure gasket is in place between element and wing nut. Clean and install baffle and dust cup, if equipped, and tighten clamp finger tight. Reset indicator by pressing reset button at end of indicator.

If indicator again turns red, the safety element should be replaced.

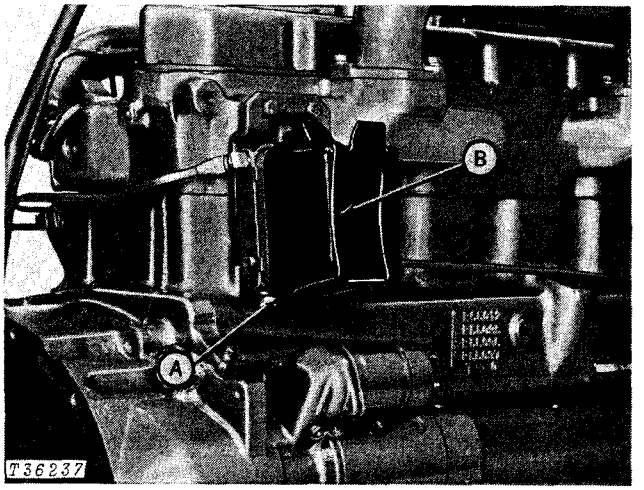
IMPORTANT: Replace safety element: (1) annually or every 1000 hours; (2) whenever the primary element is ruptured.

2. Radiator

⚠ CAUTION: Do not remove radiator filler cap until the coolant temperature is below its boiling point. Then loosen cap slowly to the stop to relieve any excess pressure before removing cap completely.

Check the level of coolant in the radiator periodically. Coolant should be maintained at a level midway between the radiator core and filler neck. Add permanent type antifreeze if cold weather is anticipated.

3. Fuel Filter



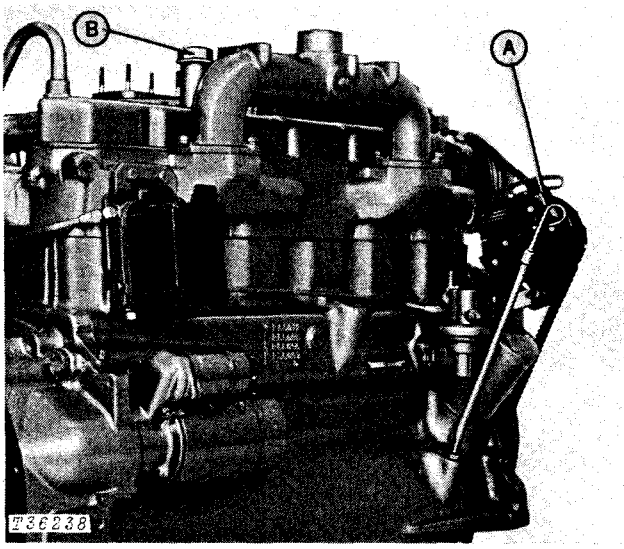
A—Fuel Filter Drain Plug **B—Fuel Filter**

Check the fuel filter and drain sediment, if necessary.

NOTE: Replace the fuel filter whenever necessary. The filter replacement interval will vary according to fuel quality and cleanliness. Using improper or dirty fuel will greatly shorten the fuel filter service life.

DAILY OR EVERY 10 HOURS

4. Engine Crankcase



A—Crankcase Dipstick **B—Crankcase Filler**

Check crankcase oil level with the engine off. (Allow a minimum of 10 minutes for the oil to drain down before checking. The best time to check the oil is after an overnight shut-down period.) If oil level is at or below bottom mark on dipstick, add sufficient oil of the proper viscosity and type specified on page 6 to bring oil level to between marks on dipstick. Do not operate engine with oil level below the bottom mark.

NOTE: There is approximately a 2-quart (1.9 l) difference between the bottom mark and the top mark on the dipstick.

5. Dry Air Cleaner

Empty dust cup, if equipped, before beginning work.

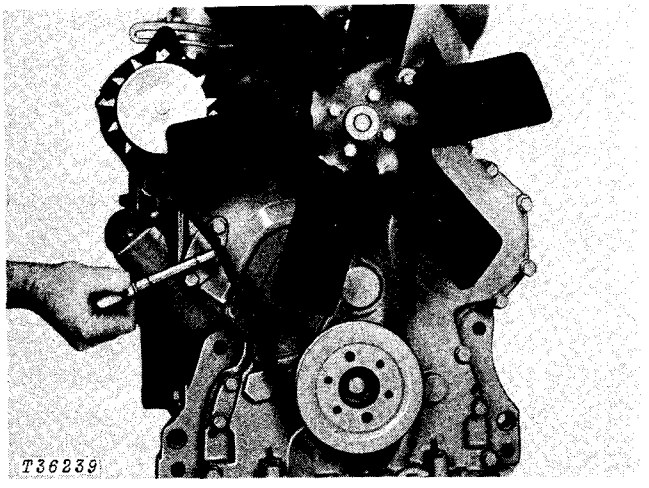
6. Pre-Cleaner (if equipped)

Check the level of accumulated material in the bowl. Empty the bowl as necessary.

EVERY 100 HOURS

7. Alternator-Fan Belt Tension

Check the tension on the alternator belt. Adjust to proper tension.



IMPORTANT: Do not pry on the rear alternator housing as this may damage the alternator. If alternator belt needs to be tightened, use the following procedure:

If belt gauge is used, tighten new fan belt to 100-110-lb. (445-489 N) tension. After 3 minutes of machine operation tension should be 80-lb. (356 N) minimum. If manual method is used, loosen the alternator bracket and adjusting cap screws and apply outward force to the FRONT alternator frame until a firm pull (20-lb. [89 N] force) on the belt midway between the pulleys will deflect the belt 3/4-inch (19 mm).

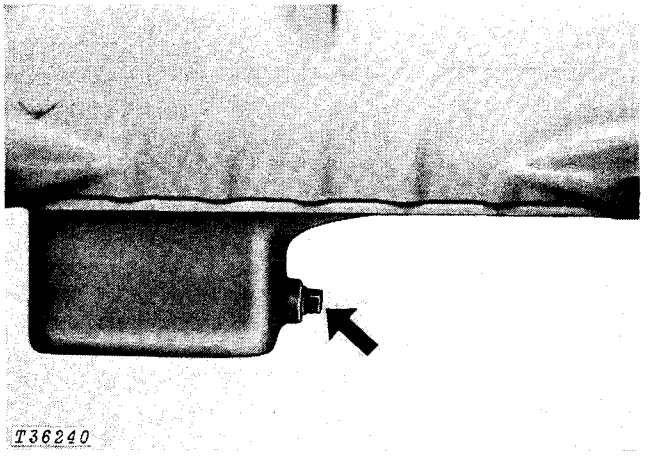
NOTE: Old fan belts should be tightened to 80-lb. (356 N) tension.

Inspect the belts periodically for wear or damage. If necessary to replace a belt, always replace BOTH belts.

JDST-28 Belt Tension Gauge, shown in use above, is available from your John Deere dealer.

8. Engine Crankcase

Replace engine oil every 100 hours of operation. Drain crankcase when the oil is hot and foreign material is in suspension.



Crankcase Drain Plug

Remove the crankcase drain plug. Allow all oil to drain. Replace plug after all oil has drained.

IMPORTANT: During intermittent cold weather operation, change oil at least every 100 hours or every six weeks, whichever occurs first. Also change oil at any seasonal change in temperature when a new viscosity of oil is required.

Refill the crankcase using the quantity of oil listed below and the viscosity of oil shown on page 6.

CRANKCASE CAPACITY

Engine Model	With Filter Change	Without Filter Change
3164D	6 qts. (6.7 l)	5 qts. (4.8 l)
4219D	6 qts. (5.7 l)	5 qts. (4.8 l)
4276D	9 qts. (8.5 l)	8 qts. (7.6 l)
4276T	14 qts. (13.2 l)	13 qts. (12.4 l)
6329D	12 qts. (11.4 l)	11 qts. (10.4 l)
6414D	18 qts. (17.1 l)	17 qts. (16.1 l)
6414T	18 qts. (17.1 l)	17 qts. (16.1 l)

Oil level should be to the top mark of the dipstick. Start engine and run for a short time to check for oil leaks around the drain plug.

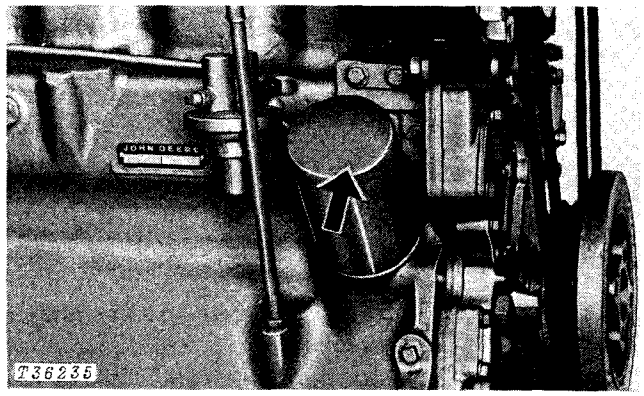
9. Batteries

Check battery electrolyte level. If distilled water is not available, use clean soft water. Avoid use of hard water. Remove foreign material from top of battery and coat terminals with petroleum jelly. Clean vent holes in battery caps.

IMPORTANT: Never add water to battery in freezing weather unless engine is to be run long enough (2 or 3 hours) to assure mixing of water and electrolyte.

EVERY 200 HOURS

10. Changing Engine Crankcase Filter Element



NOTE: The filter contains approximately 1 quart (0.9 l) of oil.

NOTE: Change yearly if this occurs prior to 200 hours.

Spin off crankcase filter element and discard it. Thoroughly clean filter mounting surface and install new element, making sure new sealing ring is inserted in bottom of element. Apply a thin film of oil to the sealing ring. Spin element down by hand until sealing ring just touches mounting pad and then turn down an additional 1-1/2 turns. Do not overtighten.

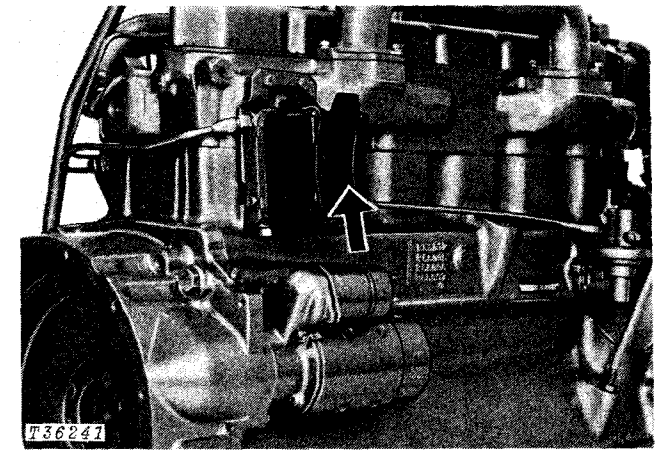
With oil in crankcase, start engine and check for leaks around filter element. Retighten only as much as necessary to eliminate leaks, but do not overtighten.

IMPORTANT: The filter element has a special bypass valve. Replace only with a genuine John Deere filter element supplied by your John Deere dealer.

After changing the filter, check the crankcase oil level. If oil level is low, add oil of the proper viscosity and quality (page 6).

EVERY 500 HOURS

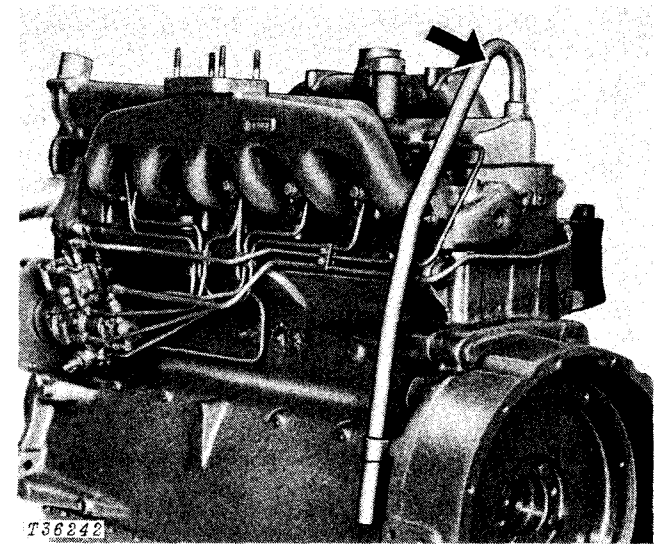
11. Fuel Filter



Replace the fuel filter. See page 19 for correct procedure.

NOTE: Change yearly if this occurs prior to 500 hours.

12. Engine Crankcase Vent Tube



Engine Crankcase Vent Tube

Remove and clean vent tube in solvent or diesel fuel. When installing tube, be sure the packing is secure in the groove in the engine rocker arm cover bore.

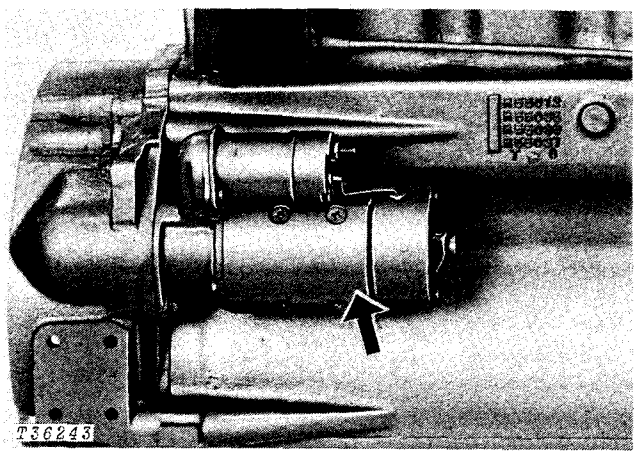
NOTE: Service vent tube more often if the engine is operating in unusually dusty conditions.

13. Check Air Intake Hoses

Check clamps on hoses which connect air cleaner and engine. Tighten hose clamps where necessary to prevent dirt from entering engine. Inspect hoses for cracks or rotting.

EVERY 1000 HOURS

14. Lubricating Starter (Delco Only)



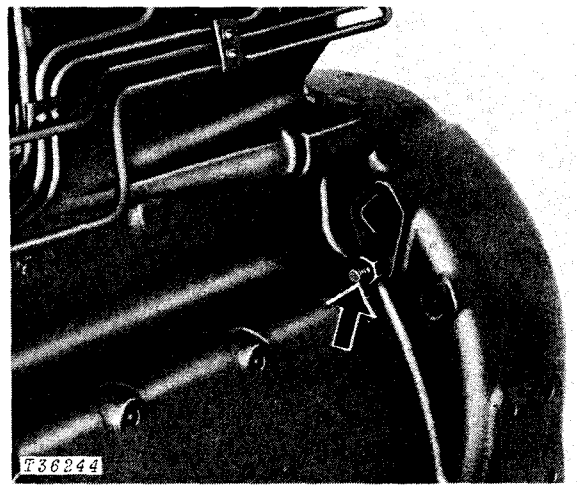
Lubricate starter. Remove oil dipstick and nipple for clearance. Be sure not to move jam nut on nipple as this will affect oil level check. Then remove starter. Remove the pipe plugs at each end of starter and saturate the wicks with SAE 10W-20 John Deere Torq-Gard Supreme engine oil or an equivalent. Install starter, nipple, and dipstick.

15. Engine Valve Tappet Adjustment

The engine valve clearance should be checked and adjusted, if necessary, after every 1000 hours.

Engine may be either hot or cold during valve adjustment.

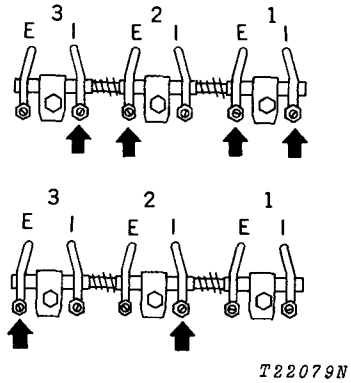
Remove rocker arm cover and vent tube from engine.



Engine "Top Dead Center" Timing Screw

Adjust as follows: Set No. 1 (front) piston at "TDC" (top dead center) of its compression stroke by turning engine. Then remove the timing cover and screw from the flywheel housing and, reversing the screw, insert it into the flywheel housing hole. Rock the flywheel until screw slides into hole in flywheel rim.

3164D Engine



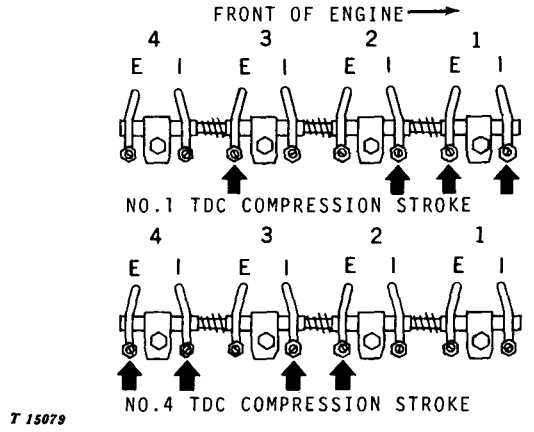
Adjusting Valve Tappet Clearance

Adjust valve clearance on No. 1 and 2 exhaust valves and on No. 1 and 3 intake valves to clearances specified. Using a feeler gauge to measure clearance, turn valve adjusting nut up or down until clearance is correct.

Remove timing screw from flywheel. Rotate engine flywheel 360 degrees and reinsert timing screw into hole on flywheel rim.

Adjust valve clearance on No. 3 exhaust and No. 2 intake valves to clearance specified.

4219D, 4276D and 4276T Engines



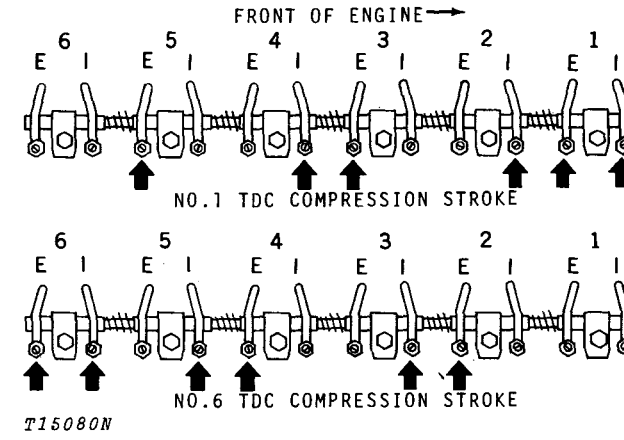
Adjusting Engine Valve Tappet Clearance

Adjust valve clearance on No. 1 and 3 exhaust and on No. 1 and 2 intake valves to clearances specified. Using a feeler gauge to measure clearance, turn valve adjusting screw up or down until clearance is correct.

Remove timing screw from flywheel. Rotate engine flywheel 360 degrees. Reinsert timing screw into hole on flywheel rim.

Adjust valve clearance on No. 2 and 4 exhaust and No. 3 and 4 intake valves to clearances specified.

6329D, 6414D and 6414T Engines



Adjusting Engine Valve Tappet Clearance

Adjust valve clearance on No. 1, 3 and 5 exhaust and on No. 1, 2 and 4 intake valves. Using a feeler gauge to measure clearance, turn valve adjusting nut up or down until clearance is correct.

Remove timing screw from flywheel. Set No. 6 piston at "TDC" of its compression stroke by rotating engine flywheel 360 degrees. Reinsert timing screw into hole on flywheel rim.

Adjust valve clearance on No. 2, 4 and 6 exhaust and No. 3, 5 and 6 intake valves.

All Engines

Remove timing screw from flywheel, reverse, and install timing cover. Install rocker arm cover and vent tube.

EXHAUST VALVES .....0.018-inch (0.46 mm)
INTAKE VALVES ..... 0.014-inch (0.36 mm)

16. Engine Speeds

Warm up engine and use tachometer to check engine speeds.

EVERY SPRING AND FALL

17. Servicing Cooling System

For efficient operation, drain, flush, and fill the cooling system with the proper coolant. Also remove any trash around the radiator. See page 21 for seasonal recommendations.

18. Servicing Engine Crankcase

Drain and refill the engine crankcase with John Deere Torq-Gard Supreme engine oil or an equivalent of the proper viscosity. See page 6. Replace the crankcase filter element.

CRANKCASE CAPACITY

Engine Model	With filter change	Without filter change
3164D	6 qts. (5.7 l)	5 qts. (4.8 l)
4219D	6 qts. (5.7 l)	5 qts. (4.8 l)
4276D	9 qts. (8.5 l)	8 qts. (7.6 l)
4276T	14 qts. (13.2 l)	13 qts. (12.4 l)
6329D	12 qts. (11.4 l)	11 qts. (10.4 l)
6414D	18 qts. (17.1 l)	17 qts. (16.1 l)
6414T	18 qts. (17.1 l)	17 qts. (16.1 l)

NOTE: Perform this service only if the 200-hour periodic service has not been performed during the previous three-week period.

ANNUALLY

19. Servicing Air Cleaner

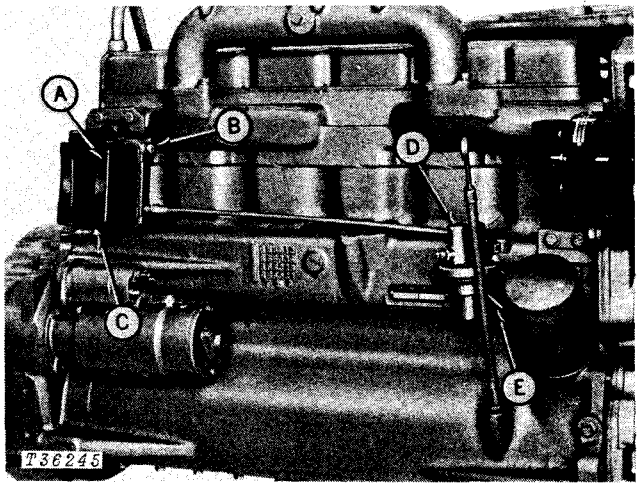
Once each year, replace the air cleaner element. Before replacing element, be sure to clean out air cleaner and dust unloading valve. See page 11.

Service

The instructions on the following pages will help you keep your engine performing efficiently and economically. For additional service and genuine parts, consult your John Deere dealer.

FUEL SYSTEM

DESCRIPTION



A—Fuel Filter
B—Bleed Screw
C—Fuel Drain Plug
D—Fuel Transfer Pump
E—Fuel Transfer Pump Primer Lever

The fuel system includes the fuel tank and sump (if equipped), fuel transfer pump, fuel filter, injection pump, fuel injection nozzles, and the lines which connect these parts.

Alteration or modification of the injection pump, the injection pump timing, or the fuel injection nozzles in ways not recommended by the manufacturer will terminate the warranty obligation to the purchaser. See your copy of the John Deere Warranty on this engine.

Do not run the engine while steam cleaning or washing near the injection pump. Excessive heat or cold when engine is running can cause pump damage.

INSPECTION AND CLEANING

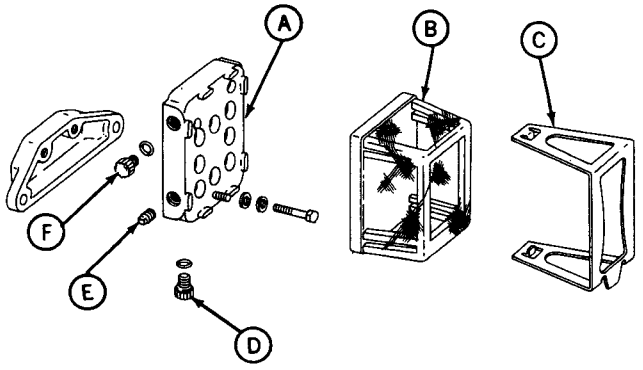
Proper servicing of the fuel system is important. Visually inspect the fuel filter daily or after every ten hours of operation. If there is water or an excess of foreign matter at the bottom of the filter, loosen the filter drain plug and drain the foreign matter or water from the filter. Bleed the fuel filter.

CAUTION: Do not refill the fuel tank when the engine is running.

Improper fuel storage may cause frequent contamination of the fuel system. If in doubt, check the fuel storage tank and other fuel containers. Fill the fuel tank at the end of each day's operation to prevent moisture from condensing in the fuel tank and other parts of the system.

After correcting the cause of dirty fuel, replace the fuel filter element and clean the filter sediment bowl, the fuel tank strainer and drain the fuel tank sump. If necessary, have your John Deere dealer clean the fuel tank, injection pump and injection nozzles. Before operating the engine, bleed the entire fuel system to remove air.

Replacing Filter Element



T 20723

A—Body
B—Element
C—Spring
D—Fuel Drain Screw
E—Fuel Inlet Plug
F—Bleed Screw

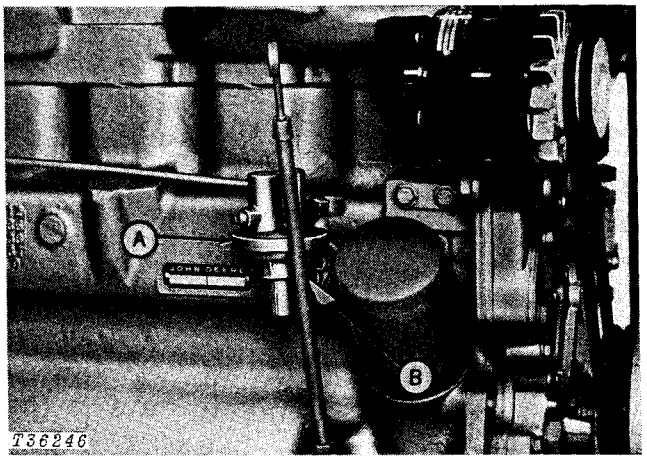
Fuel Filter

The fuel filter prevents dirty fuel from reaching the injection pump and injection nozzles. A combination first and second stage filter element is contained in the sediment bowl as a complete assembly. The filter element assembly will require occasional replacement to maintain adequate flow of fuel to the injection pump for full horsepower. The frequency of this service will be determined by the cleanliness of available fuel and the care used in fuel storage.

To release the filter retaining spring, press inward on the outside finger tab and squeeze the tabs together to disengage the top hook of the spring. Quickly pull the filter off and push the new filter over the spring pin. Hook the bottom of the filter retaining spring first and the top hook last.

IMPORTANT: Any dirt lodged in the spring pin groove or at the end of the spring pin by cleaning efforts will be washed into the injection system and may result in severe damage to the injection pump or nozzles.

FUEL TRANSFER PUMP

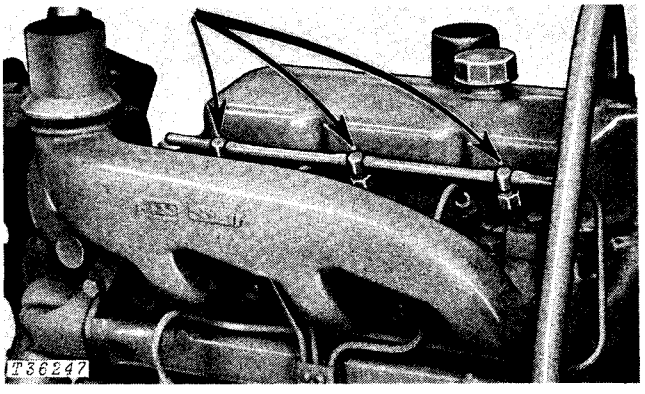


A—Fuel Transfer Pump **B—Primer Lever**

The fuel transfer pump is of the diaphragm type, actuated by an eccentric lobe on the engine camshaft.

A hand primer lever on the fuel transfer pump is used as an aid in bleeding the fuel system.

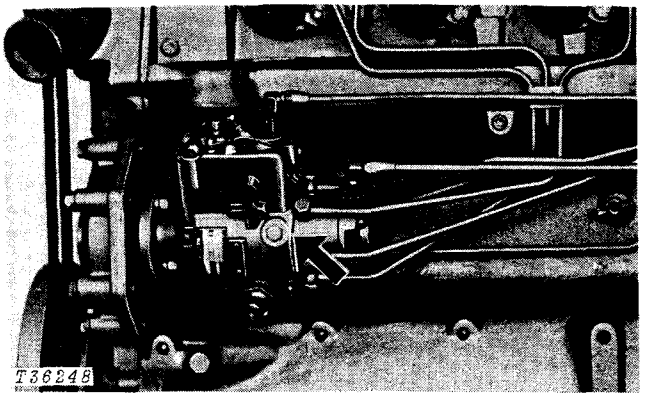
FUEL INJECTION NOZZLES



Occasionally fuel injection nozzles may require removal for inspection or service. The frequency of this service will be determined by type of operation, fuel cleanliness, and fuel quality. If faulty or dirty nozzles are indicated by abnormal engine operation, see your John Deere dealer.

IMPORTANT: Do not attempt to remove and disassemble injection nozzles, as special tools are required.

FUEL INJECTION PUMP



Service fuel injection pump only if abnormal engine operation indicates pump malfunctions. See your John Deere dealer for fuel injection pump service.

IMPORTANT: Never steam clean or spray water on a warm injection pump. This could cause seizure of pump parts.

BLEEDING THE ENTIRE FUEL SYSTEM

When the fuel filter is removed or the engine runs out of fuel, bleed the air from the fuel filter. To do so, loosen the filter bleed screw. Pump the primer lever on the fuel transfer pump until most of the air bubble in the filter is gone and fuel flows from the bleed screw. Tighten the bleed screw and leave the primer lever in the down position.

NOTE: If the primer does not pump fuel and no resistance is felt at the upper portion of the lever stroke, turn the engine to change the fuel pump cam position.

⚠ CAUTION: Escaping diesel fuel under pressure can have sufficient force to penetrate the skin, causing serious personal injury. Before disconnecting lines, be sure to relieve all pressure. Before applying pressure to the system, be sure all connections are tight and that lines, pipes and hoses are not damaged. Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, rather than hands, to search for suspected leaks.

If injured by escaping fluid, see a doctor at once. A serious infection or reaction can develop if proper medical treatment is not administered immediately.

COOLING SYSTEM

The engine may be equipped with a pressurized cooling system. This system will not operate properly unless it is air-tight, without loose connections or leaks. Otherwise, pressure will not be maintained, and loss of water and overheating will result.

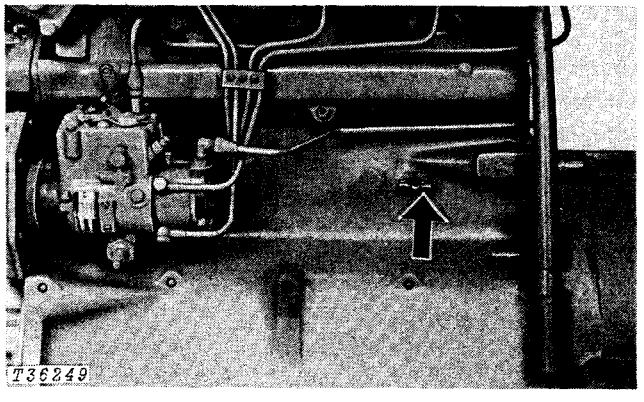
Proper operating temperature is maintained by means of a thermostat located in the water outlet manifold.

The pressure valve in the radiator filler cap is set to release when the pressure in the cooling system is 6-1/4 to 7-1/2 psi (0.4 to 0.5 bar).

⚠ CAUTION: Do not remove radiator filler cap until the coolant temperature is below its boiling point (the hand should be to the left of the vertical position on the coolant temperature gauge). Loosen cap to the stop to relieve pressure before removing cap completely.

CLEANING THE COOLING SYSTEM

For efficient operation, the cooling system should be drained, flushed, and refilled once a year.



Cylinder Block Drain Cock

To drain the system completely, the radiator drain cock and the cylinder block drain cock must be opened.

Clean the cooling system using a good radiator cleaning compound in accordance with instructions furnished with the compound.

IMPORTANT: Never pour hot water into a cold engine or cold water into a hot engine. Doing so may crack the head or the cylinder block. Do not operate the unit without water for even a few minutes.

After the system is completely drained close the drain cocks. Use soft water to fill the radiator whenever available. Well water often contains lime and other minerals which eventually may clog the radiator core and reduce the cooling efficiency. As a rust inhibitor, add a can of John Deere Summer Engine Coolant Conditioner (Part No. T19566), available from your John Deere dealer. Coolant level should be midway between the core and the bottom of the filler neck.

PREPARING FOR COLD WEATHER

Prior to cold weather, drain, flush, and fill the cooling system. Use only a reliable brand of ethylene glycol (permanent type) antifreeze which contains a rust inhibitor but does not contain a stop-leak additive.

Run the engine until it reaches normal operating temperature. This allows thermostat to open and assures the solution is circulated throughout the entire cooling system.

Recheck cooling system for leaks after antifreeze solution has been added. Condition the system with John Deere Cooling System Stop Leak Pellets, available from your John Deere dealer.

ELECTRICAL SYSTEM

BATTERIES

The batteries and battery cables used for starting the engine should be of sufficient size to provide prompt starting. Sluggish starter operation will result in prolonged starter operation and a very short starter service life.

IMPORTANT: When servicing the electrical system, disconnect the battery ground strap.

Cleaning Batteries

Keep the batteries clean by wiping them with a damp cloth whenever dirt appears excessive.

If corrosion is present around the terminal connections, remove battery cables and wash the terminals with an ammonia solution or a solution consisting of 1/4 pound (0.1 l) of baking soda added to 1 quart (0.9 l) of water.

Be sure the vent plugs are tight to prevent cleaning solution from entering the cells.

After cleaning, flush the outside of the battery, the battery compartment, and surrounding areas with clear water.

Examine the vent holes in each battery cap to make sure they are open.

Checking Specific Gravity

Use a battery hydrometer to check the specific gravity of the electrolyte in each battery cell.

NOTE: Prevailing temperatures affect the potency of battery electrolyte. Therefore, make allowance for extreme climates. In tropical areas, use a 1.225 full charge reading. In cold regions, use a 1.280 full charge reading.

Hold the hydrometer vertical and take the reading. Correct the reading by adding four gravity points (0.004) for every ten degrees the electrolyte temperature is above 80°F (27°C) or subtracting four gravity points for every ten degrees below 80°F (27°C). A fully charged battery will have a corrected specific gravity of 1.260. Charge the battery if the reading is below 1.215.

Checking Electrolyte Level

Check the level of the electrolyte (acid and water solution) in the batteries at least every 100 hours of operation.

Fill the battery cells to the bottom of the filler neck. Use distilled water when available. If distilled water is not available, use any clean water that is fit to drink and does not have a high mineral content.

NOTE: Since water and electrolyte will not mix immediately, do not add water in freezing weather unless the engine is to be run long enough (two or three hours) to assure a thorough mixing of water and electrolyte.

Cold Weather Battery Service

During cold weather, it is particularly important to keep the electrolyte in the batteries at the proper level, and to keep the batteries fully charged. Otherwise the batteries are apt to freeze. Freezing weather will have little damaging effect on a fully charged, properly filled battery.

Storing Batteries

If the engine is to be stored for more than 30 days, remove the batteries. With the electrolyte level at the bottom of the split ring, charge the battery before storing it. After every 30 days the battery is in storage, bring it back up to full charge. To minimize self-discharge, store the battery in as cool a place as possible so long as the electrolyte does not freeze. Electrolyte at 1.220 specific gravity (corrected to 80° F [27° C]) will freeze at −31°F (−35°C). A 1.260, the electrolyte will freeze at −75°F (−59°C).

Important Battery Precautions

Disconnect negative ground strap before working on any part of the electrical system or engine.

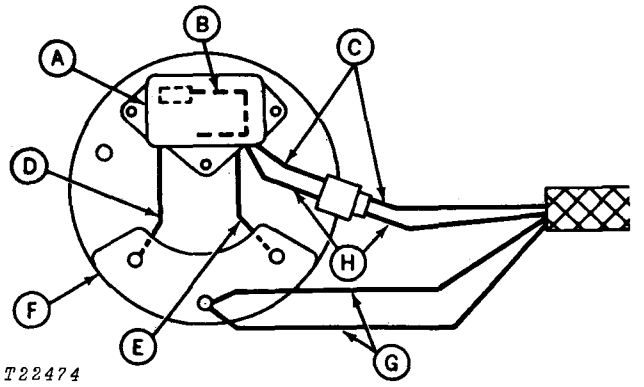
Disconnect positive terminals before charging batteries to avoid damaging alternator or regulator.

⚠ CAUTION: Gas from electrolyte is explosive. Keep batteries away from sparks or fires.

ALTERNATOR AND REGULATOR

The alternator provides electrical current for charging the batteries and for all other electrical requirements of the engine. The regulator controls voltage output of the alternator and connects or disconnects the alternator from the batteries.

The alternator and regulator are designed for a long trouble-free service life and provide a high charging rate at low engine speeds.



A—Regulator
B—Green (to Brushholder)
C—Orange
D—Red
E—Black
F—Alternator
G—Red
H—Purple

Alternator Connections

If, for any reason, the alternator wires are disconnected, connect them as shown in the above illustration.

Precautions for Alternator and Regulator

When the batteries are connected, observe the precautions listed here. Failure to observe the rules will probably result in damage to the alternator, the regulator, or both.

(1) Disconnect the negative ground strap when working on or near the alternator or regulator.

(2) NEVER ATTEMPT TO POLARIZE THE ALTERNATOR OR REGULATOR.

(3) If either the alternator or regulator wiring is disconnected, be sure that it is properly connected before the batteries are connected. (See illustration at left.)

(4) The alternator outlet terminal must never be grounded under any circumstances.

(5) The alternator field terminal or the field circuit between the alternator and the regulator must never be grounded under any circumstances.

(6) NEVER disconnect or connect any alternator or regulator wires with batteries connected or with alternator operating.

(7) Always connect batteries or a booster battery in the correct polarity.

(8) Never disconnect the batteries when engine is running and the alternator is charging.

A John Deere battery charger can be used as a booster to start the engine.

IMPORTANT: A battery charger should not be used as a booster if a battery has a very low charge (1.150 specific gravity reading or lower). A low-charged battery greatly increases the possibility of mistakenly connecting the charger to the battery in reverse, and it is possible to reverse the charge on a battery. If this is done, the alternator diodes or the wire harness may be damaged.

If the battery has a specific gravity reading of 1.150 or lower, disconnect battery cables and charge it until the specific gravity reading is 1.150 or above before using a battery charger as a booster.

STARTER

The 12-volt starter is built to carry a heavy electrical load for a short period of time. The electrical connection between the starter and the battery is made by a solenoid switch mounted on the starter.

IMPORTANT: Never hold the starter button in start position for more than 20 seconds at a time. If the engine does not start within 20 seconds, allow at least two minutes for proper cooling of the starter. Pause a few seconds after a false start to make certain that the starter has stopped completely before another start is attempted.

If the starter responds normally when the switch is operated, it can usually be considered in good condition. However, periodic checking of the starter and its electrical connections may be necessary.

Checking Causes of Sluggish Starter Operation

If the starter fails to operate or operates sluggishly, defects other than in the starter may be the cause. The battery may be run down or there may be some condition in the engine that is throwing a heavy burden on the starter.

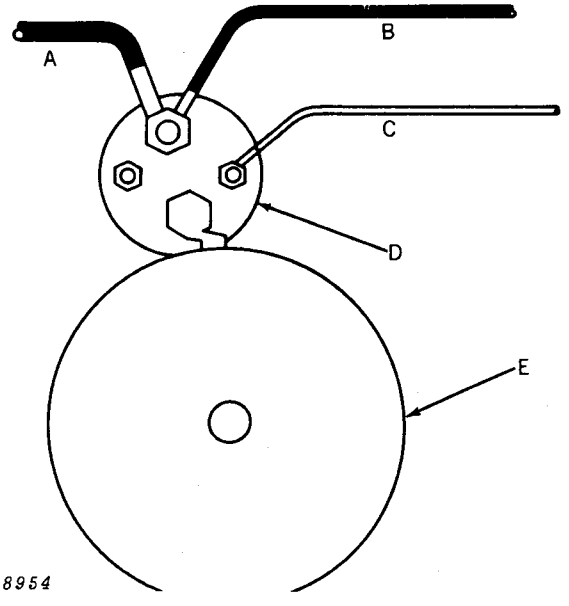
Check the specific gravity of the battery with a hydrometer and make sure that all wiring connections are clean and tight.

Dirty, loose, or corroded cables and wires will cause a starter to operate sluggishly, because they create high resistence which reduces voltage to the starter. Such conditions also permit arcing which quickly burns and pits the connections.

A tight engine or oil of too heavy viscosity places an added burden on the starter. Always use crankcase oil of the proper viscosity. Low temperatures also hamper starter performance due to decreased battery output and increased viscosity of crankcase oil.

If these checks fail to improve the operation of the starter, see your John Deere dealer.

Starter-Solenoid Connections



A—Battery Cable
B—Red
C—White
D—Solenoid
E—Starter

Starter-Solenoid Connections

If the starter and solenoid wires and cables are disconnected, be sure to connect them as shown above.

Storage

If your engine is to be put in storage for several months, the suggestions for storing it and removing it from storage on this page will help to prevent excessive deterioration.

STORING THE ENGINE

Use the AR41785 engine storage kit or its equivalent when storing the engine.

Used engine crankcase oil will not protect bearings and other surfaces from rusting or corroding during a storage period. Therefore, change the crankcase oil before storing the engine. With the engine warm, drain the engine crankcase. Replace the filter element and fill the crankcase with new oil of the proper viscosity and service.

Drain, flush and fill the cooling system. Use clean soft water and John Deere Summer Coolant Conditioner (T19566) or if freezing weather is anticipated, add enough antifreeze to protect the cooling system from freezing. Run the engine at slow idle to circulate the coolant with the thermostat open.

Service the air cleaner. See page 11.

Drain the fuel tank and add 1 ounce (29.5 cc) of inhibitor to the fuel tank for each 4 gallons (15 l) of tank capacity.

Add 1 ounce (29.5 cc) of inhibitor to the engine crankcase for each quart of crankcase oil (6 ounces [177 cc] for 3164D and 4219D engines, 9 ounces [266 cc] for 4276D, 12 ounces [354 cc] for 6329D, 14 ounces [413 cc] for 4276T and 18 ounces [531 cc] for 6414D and 6414T engines).

Disconnect the air intake pipe from the manifold. Place 3 ounces (88.5 cc) of inhibitor in the manifold. Reconnect the air intake pipe. Turn engine over slowly for 2 revolutions.

Seal the following openings with the plastic bags and tape from the kit and use the applicable items on the check list on the tag: air cleaner inlet, exhaust opening, crankcase breather pipe, fuel tank vent and radiator overflow hose.

Loosen the fan belt.

Remove, clean and store the battery as instructed on page 21.

Coat the exposed metal surfaces with a grease or corrosion preventive.

Clean the exterior of the engine and touch up the scratched or chipped painted surfaces.

Store the engine in a dry protected place or, if it is necessary to store it outside, cover it with a waterproof canvas or other suitable protective material.

REMOVING THE ENGINE FROM STORAGE

Use the following procedure to remove your engine from storage and place it in service.

Remove all protective coverings from the engine. Unseal all openings in the engine and electrical system. Follow the check list provided on the tag.

Remove the batteries from storage. Install them and connect the cables. Adjust the alternator belt tension (page 13).

Fill the diesel fuel tank with fresh fuel.

Check the engine crankcase oil level and add oil if necessary. Check and if necessary fill the cooling system to its proper level.

To help maintain power and efficiency of the engine, perform the recommended 500 hour service.

Operate the engine for a few minutes at slow idle to make certain it is in proper condition before operating under a load.

Trouble Shooting

If the engine shows a particular difficulty, check the symptoms listed on the following pages. Possible causes and remedies are given for each symptom. If a possible remedy does not correct the trouble, see your John Deere dealer. He has factory-trained mechanics and the latest technical literature and equipment to put your engine back in operating condition.

Engine Hard to Start or Will Not Start

Improper starting procedure.
No fuel.
Low battery output.
  Check electrolyte level and specific gravity of the battery. Page 22.
Excessive resistance in starting circuit.
  Clean and tighten all connections on batteries and starter.
Crankcase oil too heavy.
  Use oil of proper viscosity. Page 6.
Improper type of fuel.
  Consult fuel supplier and use proper type of fuel for operating condition. Page 5.
Water, dirt, or air in fuel system.
  Drain, flush, fill and bleed system. Page 20.
Clogged fuel filter.
  Replace filter element. Page 19.
Dirty or faulty injection nozzles.
  Have your John Deere dealer check the injection nozzles.
Fuel pump primer lever left on upward end of stroke.

Engine Runs Irregularly or Stalls Frequently

Low coolant temperature.
  If water temperature gauge is not in normal range, see "Below normal engine temperature".
Clogged fuel filter.
  Replace filter element. Page 19.
Water, dirt, or air in fuel system.
  Drain, flush, fill and bleed system. Page 20.
Dirty or faulty injection nozzles.
  Have your John Deere dealer check the injection nozzles.
Inspect clamps and hose. Replace if necessary.
Use only approved parts.
Improper type of fuel.
  Use proper type of fuel for operating conditions. (Page 5.)

Engine Knocks

Insufficient oil.
  Call your John Deere dealer.
Injection pump out of time.
  See your John Deere dealer.
Low coolant temperature.
  See "Below normal engine temperature". Page 27.
Engine overheating.
  See "Engine Overheats". Page 27.

High Fuel Consumption

Improper type of fuel. Page 5.
Clogged or dirty air cleaner.
  Service air cleaner. Page 11.
Engine overloaded.
  Reduce load.
Improper valve clearance. Page 15.
Injection nozzles dirty.
  See your John Deere dealer.
Injection pump out of time.
  See your John Deere dealer.
Engine not at proper temperature.
  Check thermostats.

Below Normal Engine Temperature

Defective thermostat.
  Remove and check thermostat.

Lack of Engine Power

Engine overloaded.
  Reduce load.
Intake air restriction.
  Service air cleaner. Page 11.
Clogged fuel filter.
  Replace filter element. Page 19.
Improper type of fuel. Page 5.
Overheated engine.
  See "Engine Overheats".
Below normal engine temperature.
  Remove and check thermostat.
Improper valve clearance. Page 15.
Dirty or faulty injection nozzles.
  Have your John Deere dealer check the injection nozzles.
Injection pump out of time.
  See your John Deere dealer.
Inspect clamps and hose. Replace as necessary.
Use only approved parts.

Engine Overheats

Engine overloaded.
  Reduce load.
Low coolant level.
  Fill radiator to proper level.
  Check radiator and hoses for loose connections and leaks.
Loose or defective fan belts.
  Adjust belt tension. Page 13.
Dirty cooling system radiator core.
  Remove all foreign matter from exterior of radiator core.
Cooling system needs flushing.
Defective thermostat.
  Remove and check thermostat.
Defective temperature gauge.
  Check water temperature with thermometer and replace gauge if necessary.

Low Oil Pressure

Low oil level. Page 12.
Improper type of oil.
  Drain and fill crankcase with oil of the proper viscosity and quality. Pages 6,13.
Partially plugged oil filter.
  Replace filter.

High Oil Consumption

Crankcase oil too light.
  Use proper viscosity oil. Page 6.
Oil leaks.
  Check for leaks in lines around gaskets and drain plug.
Engine overheats.
  See "Engine Overheats."

Engine Emits Black or Gray Exhaust Smoke

Clogged or dirty air cleaner.
  Service air cleaner. Page 11.
Defective muffler.
Improper type of fuel. Page 5.
Engine overloaded.
  Reduce load.
Injection nozzles dirty.
  See your John Deere dealer.
Engine out of time.
  See your John Deere dealer.

Engine Emits White Smoke

Improper type of fuel. Page 5.
Cold engine.
  Warm up engine to normal operating temperature.
Defective thermostat.
  Remove and check thermostat.
Engine out of time.
  See your John Deere dealer.

ELECTRICAL SYSTEM

Battery Will Not Charge

Loose or corroded connections.
Clean and tighten battery connections.
Sulfated or worn-out batteries.
Check specific gravity of each battery. Page 22.
Check electrolyte level of each battery. Page 22.
Loose or defective alternator belt.
Adjust belt tension. Page 13.
Replace belt. Page 13.

Starter Inoperative

Loose or corroded connections.
Clean and tighten loose connections.
Low battery output.
Check specific gravity of each battery. Page 22.
Check electrolyte level of each battery. Page 22.
Defective electrical system ground wire.
Repair or replace.

Starter Cranks Slowly

Low battery output.
Batteries too small.
Battery cable too small.
Check specific gravity of each battery. Page 22.
Check electrolyte level of each battery. Page 22.
Crankcase oil too heavy. Page 6.
Loose or corroded connections.
Clean and tighten loose connections.

Entire Electrical System Does Not Function

Faulty battery connection.
Clean and tighten connections.
Sulfated or worn-out batteries.
Check specific gravity and electrolyte level of each battery. Page 22.

Specifications

SPECIFICATION	UNIT OF MEASURE	SERIES 300						
		3164D	4219D	4276D	4276T	6329D	6414D	6414T
Number of cylinders		3	4	4	4	6	6	6
Fuel		Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel
Bore	in	4.02	4.02	4.19	4.19	4.02	4.19	4.19
	(mm)	(102)	(102)	(106)	(106)	(102)	(106)	(106)
Stroke	in	4.33	4.33	5.00	5.00	4.33	5.00	5.00
	(mm)	(110)	(110)	(127)	(127)	(110)	(127)	(127)
Displacement	cu. in.	164	219	276	276	329	414	414
	cm^3	(2690)	(3590)	(4520)	(4520)	(5390)	(6780)	(6780)
Compression ratio		16.8:1	16.8:1	16.3:1	16.3:1	16.8:1	16.3:1	16.3:1
Rated speed	RPM	2500	2500	1800	2200	2500	2200	2200
HP (intermittent) @ RS without fan		52	70	82	95	104	120	142
HP (continuous) @ RS without fan		44	60	58	*74	88	*91	*113
Normal working range	RPM	1500-2500	1500-2500	1500-2500	1500-2500	1500-2500	1500-2500	1500-2500
Low idle		800	800	800	800	800	800	800
Torque @ RPM (max.) without fan	lb/ft (Nm)	122 (165) @ 1500	175 (237) @ 1400	214 (290) @ 1300	250 (339) @ 1500	250 (335) @ 1500	330 (447) @ 1200	390 (529) @ 1500
Basic Weight	lb	695	845	950	975	1145	1220	1250
	(kg)	(315)	(383)	(431)	(442)	(519)	(553)	(567)
Flywheel housing and flywheel		SAE No. 2 SAE No. 4	SAE No. 2 SAE No. 3 SAE No. 4	SAE No. 2 SAE No. 3 SAE No. 4	SAE No. 2 SAE No. 3 SAE No. 4	SAE No. 2 SAE No. 3 SAE No. 4	SAE No. 2 SAE No. 3	SAE No. 2 SAE No. 3
Nozzles	mm	9.5	9.5	9.5	9.5	9.5	9.5	9.5
Fuel filter area	in^2	860/490	860/490	860/490	860/490	860/490	860/490	860/490
	cm^2	(5549/3161)	(5549/3161)	(5549/3161)	(5549/3161)	(5549/3161)	(5549/3161)	(5549/3161)
Dimensions:								
Width	in	19.88	19.72	19.72	19.72	19.62	19.62	19.62
	(mm)	(505)	(500.9)	(500.9)	(500.9)	(498.5)	(498.5)	(498.5)
Height	in	32.01	32.03	33.31	37.16	31.78	36.58	42.15
	(mm)	(813)	(812.6)	(846.1)	(943.9)	(807.2)	(929.1)	(1070.6)
Length	in	27.64	32.68	32.72	34.74	45.81	43.63	43.63
	(mm)	(702.1)	(830)	(831.1)	(882.4)	(1163.6)	(1108.2)	(1108.2)
Crankcase capacity with filter change	qts.	6	6	9	14	12	18	18
	(l)	(5.7)	(5.7)	(8.5)	(13.2)	(11.4)	(17.1)	(17.1)
without filter change	qts.	5	5	8	13	11	17	17
	(l)	(4.8)	(4.8)	(7.6)	(12.4)	(10.4)	(16.1)	(16.1)

*Based on 1800 rpm.

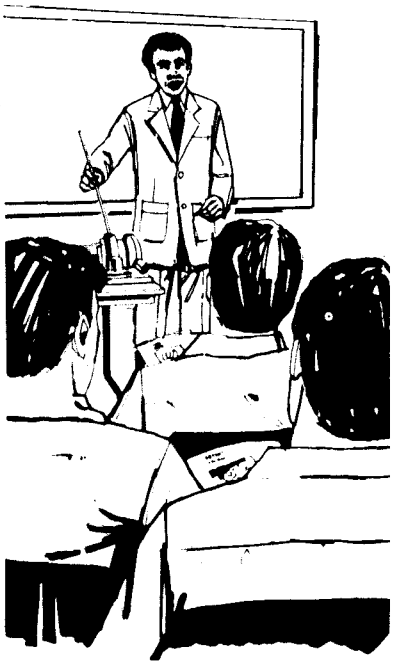
INDEX

Service to keep you on the job

We, at your John Deere dealer's, pride ourselves in having what it takes to help keep you on the job . . .

John Deere Parts.
We help minimize downtime by putting the right parts in your hands in a hurry. That's why we maintain a large and varied inventory—to stay a jump ahead of your needs.

The right tools.
Precision tools and testing equipment enable our Service Department to locate and correct troubles quickly . . . to save you time and money.



Well-trained technicians.
School is never out for John Deere service technicians. Training schools are held regularly to be sure our personnel know your equipment and how to maintain it. Result? Experience you can count on!

Prompt service.
Our goal is to provide prompt, efficient care when you want it and where you want it. We can make repairs at your place or at ours, depending on the circumstances. See us. Depend on us.

John Deere Service Superiority: We'll be around when you need us