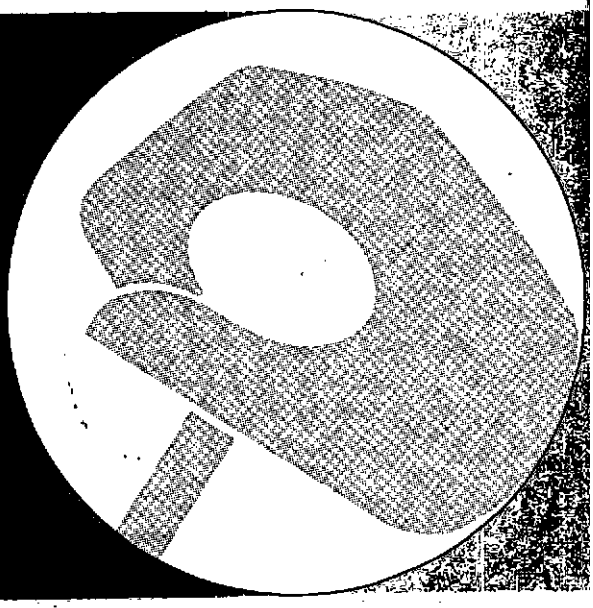
400 and 500 Series Engines



John Deere Engine Works
OM-R67604 Issue J9
LITHO IN U.S.A.

To the Operator

This new engine was carefully designed and manufactured to give years of dependable service. To keep it running efficiently, follow 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 3. 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.

IMPORTANT WARRANTY INFORMATION

The warranty on this engine appears on your copy of the purchase order which you should have received from your dealer when making your purchase. This warranty provides you the assurance that John Deere will back its products where defects appear within the warranty period. In some circumstances, John Deere also provides field improvements, often without charge to the customer, even if the product is out of warranty.

Warranty and field improvements are a part of John Deere's product support program for customers who operate and maintain their equipment as described in this manual. Should the equipment be abused, or modified to change its performance beyond the original factory specifications, the warranty will become void and field improvements may be denied. Setting fuel delivery above specifications or otherwise overpowering machines will result in such action.

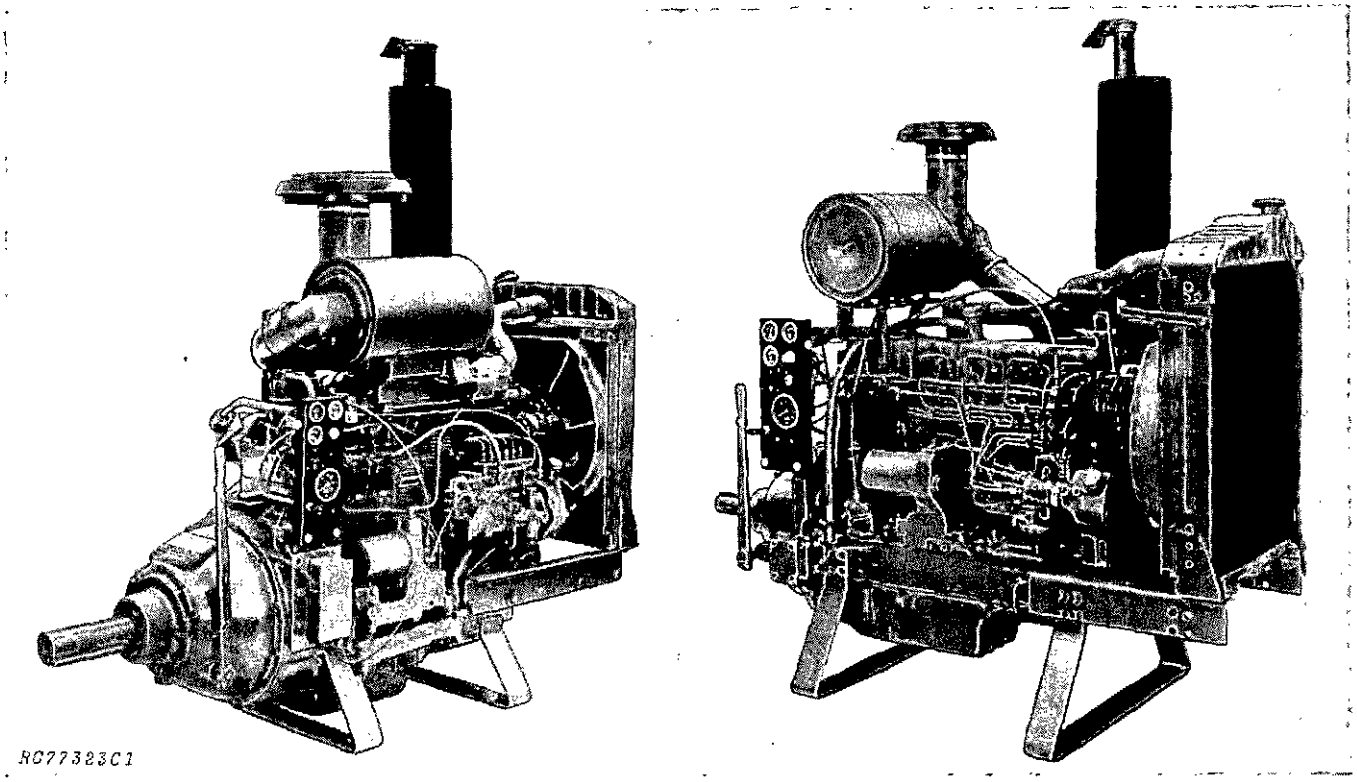
This safety alert symbol indicates important safety messages in this manual. When you see this symbol, be alert to the possibility of personal injury and carefully read the message that follows.

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

All 400 and 500 Series OEM and Stationary engines are six-cylinder diesel engines. In an engine designation such as 6466D, the 6 indicates a six-cylinder engine, 466 indicates 466 cubic inches (7.6 L), and D indicates a naturally-aspirated diesel engine. A suffix of T (instead of D) indicates a turbocharged engine. A suffix of A indicates a turbocharged and intercooled engine. A 6619A is a six-cylinder, 619 cubic inch (10.1 L), turbocharged and intercooled engine.

Certain engine accessories such as radiator, air cleaner, starter, and instruments are optional equipment on John Deere OEM and Stationary Engines. These accessories may be provided by the equipment manufacturer instead of the John Deere factory. This operator's manual applies only to the engine and those accessories provided by the John Deere factory.

Contents



RC77323C1

6619A (left) and 6466D Stationary Engines

Safety

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.

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.

Remove all trash accumulation from the engine and surrounding area daily.

Before using booster batteries read the instructions on page 5. 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 in motion.

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.

⚠ CAUTION: Be sure the PTO drive shaft between the clutch housing and the engine-driven equipment is shielded at all times during engine operation.

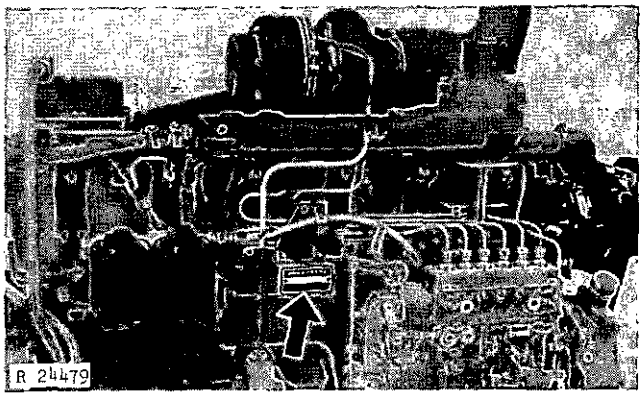
Walk completely around the engine making sure everything is clear before starting. Be sure all shields and safety devices are properly installed.

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

Serial Number and Accessory Codes

SERIAL NUMBER

A serial number is assigned to each engine. Enter the engine type and serial number below. Provide this information to your John Deere dealer when ordering parts.



Engine Type_____Engine Serial No. _____

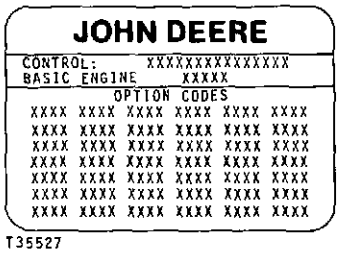
OEM ACCESSORY CODES

In addition to the serial number plate, an OEM Engine also has an accessory code label affixed to the rocker arm cover. Stationary Engines do not have this code label.

The accessory codes indicate which of the optional engine accessories were installed on your engine at the factory.

The first two digits of each code identify a specific area, such as alternator or radiator.

Accessory Codes	Description
11____	Rocker Arm Cover
12____	Oil Filler
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
24____	Fan Belts



OEM Accessory Code Label

The last two digits of each code identify the specific options provided on your engine, such as a 72-amp alternator or a particular radiator.

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

1101 Rocker Arm Cover, Center Filler

1102 Rocker Arm Cover, No Filler

If an engine is ordered without a particular component, the last two digits of that functional group code will be zeros. 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. Enter the third and fourth digits shown on your engine code label in the spaces provided below.

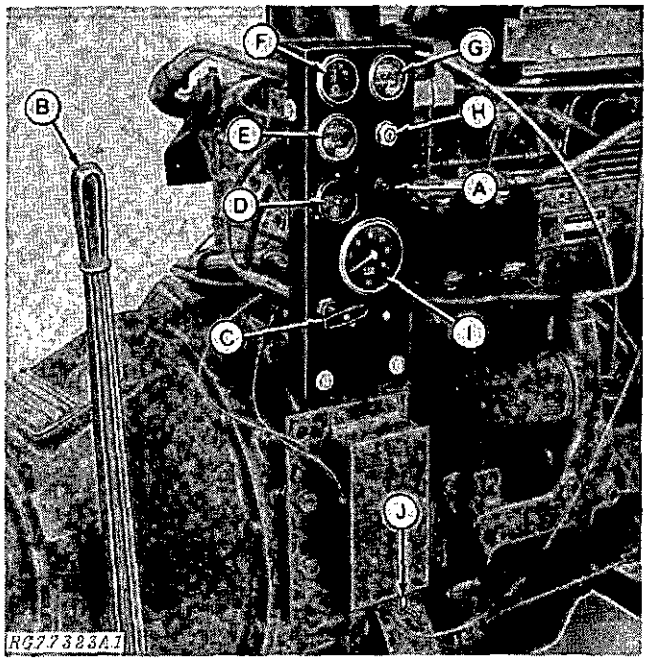
When in need of parts or service, furnish your John Deere dealer with these numbers.

Accessory Codes	Description
25____	Fan
26____	Engine Heater
27____	Radiator
28____	Exhaust System
29____	Vent System
30____	Starting Motor
31____	Alternator
32____	Instrumentation and Controls
33____	Tachometer
34____	Hour Meter
53____	Enclosure
55____	Engine Stands
56____	Paint
58____	Clutch and PTO

Controls and Instruments

Before operating your engine, familiarize yourself with the location and function of all controls and instruments.

NOTE: All controls and instruments are optional equipment on John Deere OEM Engines. They may be provided by the equipment manufacturer instead of the John Deere factory. The following information applies only to those controls and instruments provided by the John Deere factory.



Engine Controls and Instruments—All Models

A - Magnetic Switch Reset Button

"D" engines and "A and T" engines with RP-75 Rack Puller are equipped with a magnetic engine protection switch to stop the engine and prevent damage from low oil pressure or overheated coolant. The oil pressure and coolant temperature gauges have contacts that close and ground the magnetic switch. The switch then stops current flow to the diesel injection pump shut-off device.

When starting these engines, hold the magnetic switch reset button in until the engine oil pressure is sufficient to prevent the gauge from tripping the magnetic switch and stopping the engine.

A - Engine Stop Button (Engine With RP-20 Rack Puller)

The engine stop button is used to stop the turbocharged engine. Depressing the button closes the engine stop circuit and causes the rack puller to pull the injection pump fuel shut-off lever to the engine stop position.

B - PTO Clutch Lever

Push the lever forward to engage the PTO clutch and pull the lever rearward to disengage the clutch.

C - Hand Throttle

The hand throttle is used to control engine speed. Turning the handle all the way clockwise or counterclockwise will lock the throttle position. Turn the handle half way between the two lock positions to unlock the throttle.

D - Electric Hour Meter

The electric hour meter shows the accumulated hours of engine service in hours and tenths of hours.

E - Oil Pressure Gauge

This gauge shows engine oil pressure. It has an electrical contact that automatically shuts the engine off when oil pressure drops to 15 psi (1.0 bar) (1.0 kg/cm²). On a turbocharged engine, the gauge has a button that is used when starting the engine. The button holds the gauge pointer away from the contact until oil pressure rises above 20 psi (1.4 bar) (1.4 kg/cm²).

F - Ammeter

The ammeter indicates the rate of charge (+) or discharge (−) of the battery. When the engine is first started, the ammeter will usually indicate an alternator charge rate of approximately 30 amps. After a short period of operation, the ammeter pointer will be slightly to the right of "0".

G - Coolant Temperature Gauge

This gauge indicates engine coolant temperature. It also has an electrical contact that automatically shuts the engine off when coolant temperature rises to 220°F (105°C).

H - Key Switch

The key switch controls the electrical system. It has four positions—accessory (not used), off, on, and start. When the switch is released from start position, a spring inside the switch returns it to the on position.

I - Tachometer

The tachometer indicates engine speed in hundreds of revolutions per minute.

J - Rack Puller (Engine With Turbocharger)

An engine with a turbocharger has a rack puller to stop the engine, should the engine oil pressure drop too low or the coolant temperature rise too high. If the engine has the crankcase oil level switch, the engine will stop if the crankcase oil level is too low or too high.

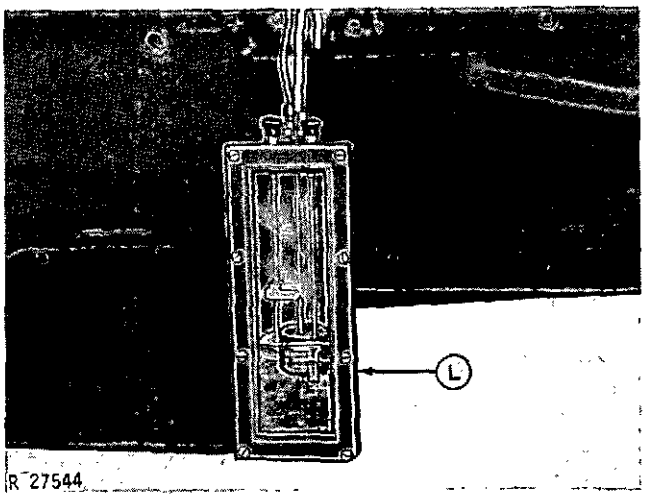
When the engine stop circuit is closed by the engine stop button or an engine protection gauge, the rack puller trips and moves the fuel shut-off lever on the injection pump to the engine stop position.

Engines with the following serial numbers

6466TF and TR-09 (	-033054)
6466AF and AR-03 (	-030292)
6619AF and AR-04 (	-026426)

are equipped with the RP-20 Rack Puller shown on the previous page. On these engines pull the rack puller reset handle all the way downward to move the injection pump shut-off lever to the engine run position.

On engines after the above serial numbers, an RP-75 Rack Puller, as shown on page 6, is used. This rack puller does not have to be reset as with the RP-20.



Crankcase Oil Level Switch

L - Crankcase Oil Level Switch

This switch will stop the engine if the oil level gets too low or if the coolant gets into the crankcase and increases the oil level above the upper pointer. Turn the adjusting knobs to adjust the pointers to the levels indicated on the dipstick.

The crankcase oil level switch is available from your John Deere dealer.

Operation

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

PRESTARTING CHECKS

Perform the following checks and services before starting the engine for the first time each day.

(1) Check the engine crankcase oil level. See page 15.

(2) Check the radiator coolant level. See page 15.

(3) Check the sediment chamber of the diesel fuel filter for water or excessive foreign matter. If present, drain the filter. See page 18.

(4) Inspect the air cleaner; service if necessary. See page 13.

(5) Lubricate the PTO clutch release bearing, if equipped. See page 15.

STARTING THE ENGINE

NOTE: The controls and instruments for your engine may be different from those shown here. The following instructions apply to the optional controls and instruments available from the John Deere factory.

(1) Perform the five prestarting checks listed above.

(2) When present, open the fuel supply shut-off valve.

(3) Disengage the clutch (A).

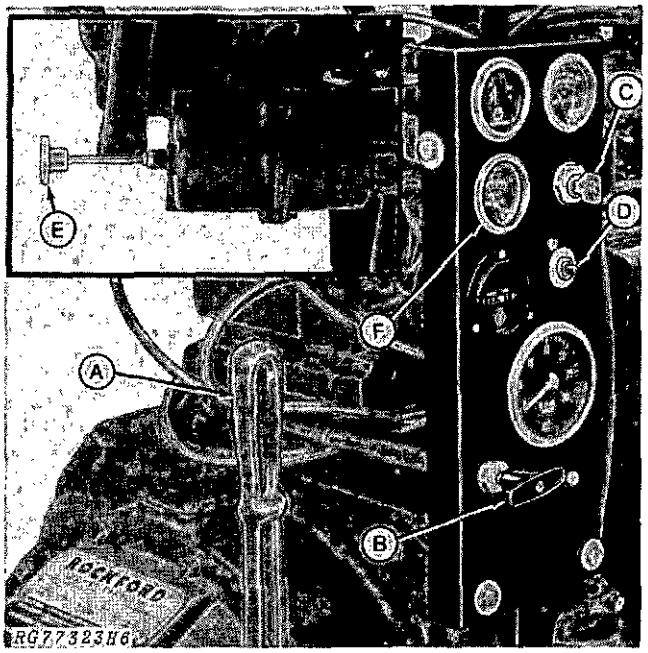
(4) Pull the hand throttle (B) 1/3 of the way out. Turn the handle in either direction to lock it in place.

(5) On turbocharged engines with an RP-20 Rack Puller, reset the rack puller by pulling the handle down until the mechanism locks.

On turbocharged engines with an RP-75 Rack Puller, push the rack puller knob (E) all the way in and hold.

(6) On turbocharged engines with a stop button (location D), push and hold the button on the oil pressure gauge (C).

On engines with a reset button (location D), push and hold the reset button.



A—Clutch Lever
B—Hand Throttle
C—Key Switch
D—Reset Button
E—RP-75 Rack Puller
F—Oil Pressure Gauge

Starting Controls - All Models

IMPORTANT: When the engine has been stopped by an automatic operation of the oil pressure switch or the water temperature switch, determine and correct the reason for the engine shut-off before starting the engine. If stopped by the temperature switch, wait until the engine cools below 215°F (102°C).

(7) Turn the key switch (C) clockwise to start the engine. When the engine starts, release the key so that it returns to the on position. Do not operate the starter for more than thirty seconds at a time. To do so may overheat the starter. If the engine does not start the first time, wait at least two minutes before trying again. If it does not start after four attempts, see "Trouble Shooting".

If the key switch is released before the engine starts, wait until the starter and the engine stop turning before trying again. This will prevent possible damage to the starter.

(8) After the engine starts, the oil pressure gauge (F) should indicate pressure of 20 psi (1.4 bar) (1.4 kg/cm²) or more. Release the reset button, oil pressure gauge button and rack puller knob. The ammeter should indicate that the alternator is charging the battery. If either gauge does not indicate normal operation after the engine has been running for 10 seconds, stop the engine and determine the cause.

Turbocharged Engines - To insure turbocharger lubrication after starting the engine, do not exceed 1000 rpm until the engine oil pressure indicator reaches 20 psi (1.4 bar) (1.4 kg/cm²).

Should the engine be killed when operating under load, immediately restart the engine to prevent overheating of turbocharger parts, caused when the flow of oil for cooling and lubrication is stopped.

When starting the engine after having been in storage, crank the engine with the starter (but do not start the engine) until the oil pressure gauge shows oil pressure. Do not operate the starter more than 30 seconds at a time. After the gauge indicates oil pressure, start engine as directed.

CONNECTING BOOSTER BATTERIES

Cold weather starting can be made easier by connecting an additional 12-volt battery in parallel with the battery on the unit.

At low temperatures booster battery cables of 000 size will usually conduct sufficient current for starting diesel engines.

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

Connect a jumper cable to the POSITIVE (+) post of a 12-volt booster battery and to the POSITIVE (+) post of the battery that is connected to the starter. Connect one end of the second jumper cable to the NEGATIVE post of the booster battery and the other end to a good ground on the engine frame away from the battery. (On a 6619A engine, connect to the starter end frame terminal at the engine.) Never connect jumper cables to pipes or thin sheet metal.

IMPORTANT: Reversed polarity booster battery connections will damage the alternator, the regulator or the electrical wiring. Always connect positive to positive and negative to ground (starter end frame terminal on 6619A engine).

See your John Deere dealer for additional booster battery information.

WARM-UP

Always be sure the engine is warmed up properly before operating under a full load.

A good way to do this is first to idle the engine at about 1500 rpm for five minutes. Then engage the clutch and operate the engine at 1800 rpm.

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

IDLING

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

ENGINE SPEEDS

On 6466D and T engines, rated speed is 2200 rpm. On 6466A and 6619A engines, rated speed is 2100 rpm.

Working speed of any engine can be anywhere between 1500 rpm and the rated speed.

Rated speed is at full throttle and full load. At full throttle and no load, speed may be approximately 60-200 rpm higher.

Normal slow idle speed is 800 rpm.

USING ENGINE HAND THROTTLE

Pull the hand throttle outward to increase or push inward to decrease engine speed. The handle is held in position by turning as far as possible to the left or right to lock the throttle position. To unlock the throttle, turn the handle half way between the two lock positions.

BREAKING IN THE ENGINE

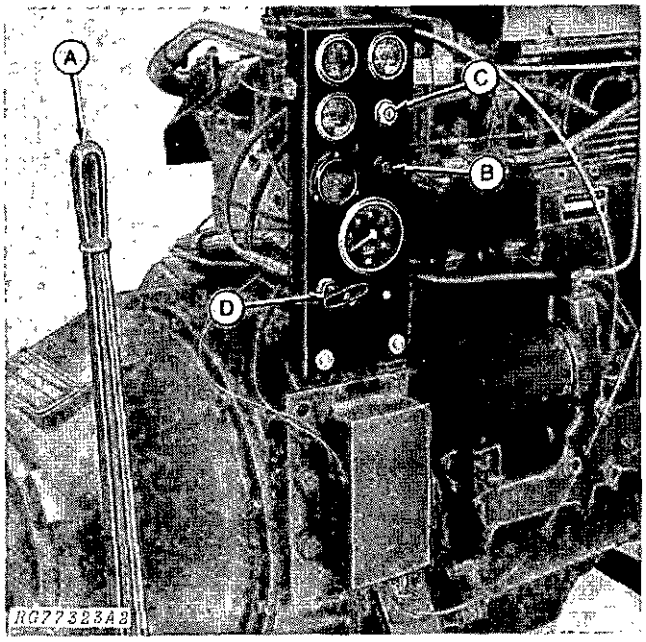
NOTE: Be sure to follow the special break-in lubrication instructions given on page 11.

With the following exceptions, the engine is ready for normal operation.

If the coolant temperature rises above 210°F (100°C) reduce the load on the engine.

During the first 20 hours, do not operate above 1900 rpm. To facilitate break-in, avoid prolonged periods of engine idling for the first 100 hours of service.

STOPPING THE ENGINE



A—Clutch Lever
B—Engine Stop Button
C—Key Switch
D—Throttle

Stopping Controls
(Early Turbocharged Engine Shown)

Disengage the engine clutch (A) and allow the engine to idle from 3 to 5 minutes to cool the engine and turbocharger (if equipped).

Lubrication and cooling of some engine parts and the turbocharger is provided by the engine lubricating oil. Therefore, sudden stopping of a hot engine may allow some parts to overheat and cause possible damage.

On early turbocharged engines (with RP-20 Rack Puller), depress the engine stop button (B). After engine stops, turn the key switch (C) off.

On late turbocharged engines (with RP-75 Rack Puller) and non-turbocharged ("D") engines, turn the key switch (C) off to stop the engine.

On all engines, return the throttle (D) to the slow idle position and remove the key.

Fuels and Lubricants

DIESEL FUELS

Diesel Fuel Specifications

Use either Grade No. 1-D or Grade No. 2-D fuel as defined by ASTM Designation D975 for diesel fuels. Use chart at right to determine correct grade of fuel.

Fuel sulphur content should be less than 1.0 percent—preferably less than 0.5 percent. Diesel fuel having sulphur content higher than 1.0 percent may cause increased wear on metal engine parts because of acids produced by sulphur during combustion.

Cetane number should be no less than 40 to assure satisfactory starting and overall performance.

Cloud point should be at least 10°F (6°C) below lowest expected air temperature at time of starting. Wax can separate from fuel when temperature decreases to cloud point and may plug filters.

DIESEL FUELS

Air Temperature* (At Time of Starting)	Diesel Fuel Grade No.
40°F (5°C) and above	2-D
Below 40°F (5°C)	1-D

*At altitudes above 5000 ft. (1500 m), use Grade 1-D for all temperatures

Storing and Handling Fuel

Buy good quality, clean fuel from a reputable supplier.

Proper fuel storage is critically important. Use clean storage and transfer tanks. Periodically drain water and sediment from bottom. Avoid storing fuel over long periods of time.

Filling 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 toward 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

X3377

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

MULTI-VISCOSITY OILS

API Service CC/SD
MIL-L-46152

Depending upon the expected prevailing 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.

GREASES

Use John Deere Multi-Purpose Lubricant or an equivalent SAE multipurpose-type grease for all grease fittings. Application of grease as instructed in the lubrication section will provide proper lubrication and will keep contamination out of bearings.

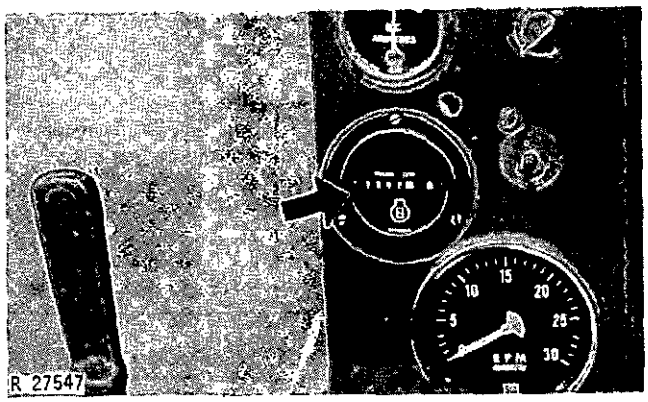
STORING LUBRICANTS

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

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



Hour Meter

If the engine is equipped with an electric hour meter, use it to determine when the periodic services are required. The hour meter, which operates whenever the key switch is on, shows the accumulated hours of operation.

BREAK-IN PERIOD

The break-in period is vitally important to the long life and satisfactory performance of your engine. During this period, follow the special engine operating instructions on page 8.

After the first 100 hours of service, change the engine oil and oil filter. Thereafter change the filter at the normal interval. If, during the first 100 hours only, it is necessary to add engine oil, use SAE 10W-20 Torq-Gard Supreme or the proper single viscosity engine oil meeting specification MIL-L-46152 or designated for API Service CC/SD.

LUBRICATION AND SERVICE INTERVALS

The lubrication and service intervals are based on operation under average conditions. When the engine is operated under unusual conditions such as excessive heat, cold, dust, frequent starts and stops, or with poor quality fuels or lubricants, the engine should be serviced at MORE FREQUENT INTERVALS.

The chart on the following page is a condensed 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.

Perform the indicated services at the time intervals specified in the chart.

AS REQUIRED

Item No.	Component	Service	Capacity or Measurement	Type of Lubricant
AR-1	Air cleaner	Clean element	.....	.....
AR-2	Fuel filter	Replace	.....	.....
AR-3	Fuel injection nozzles	Clean	See your John Deere dealer for this service.	
AR-4	Injection pump	Check timing	See your John Deere dealer for this service.	

DAILY OR EVERY 10 HOURS

Item No.	Component	Service	Capacity or Measurement	Type of Lubricant
10-1	Engine crankcase	Check oil level	To upper mark	See page 10 for recommended engine oil.
10-2	Radiator	Check coolant level	1-1/2 inches (35 mm) above baffle in radiator	.....
10-3	Fuel filter	Check sediment chamber	.....	.....
10-4	Power take-off clutch	Lubricate release bearing	1 shot of grease	John Deere Multi-Purpose Lubricant

EVERY 50 HOURS

50-1	Power take-off clutch	Lubricate main shaft bearings Lubricate clutch shaft lever	1 or 2 shots of grease 1 shot of grease	John Deere Multi-Purpose Lubricant

EVERY 100 HOURS

100-1	Engine crankcase	Drain and fill	See page 16	See page 10.

EVERY 200 HOURS

200-1	Engine crankcase	Replace filter. Change oil	.....	.....
200-2	Fan belts	Check tension	See page 23.	.....
200-3	Batteries	Check electrolyte level	To bottom of filler neck	.....
200-4	Power take-off clutch	Check adjustment	See page 17	.....
200-5	Cooling system (6619A)	Change coolant filter conditioner	See page 16	.....

EVERY 600 HOURS

600-1	Air intake hoses	Check connections	.....	.....
600-2	Intake and exhaust valves	Check valve clearance	See your John Deere dealer.	
600-3	Engine	Check idle speeds	.....	.....
600-4	Power take-off clutch	Internal levers and linkage	1 or 2 drops	Engine oil

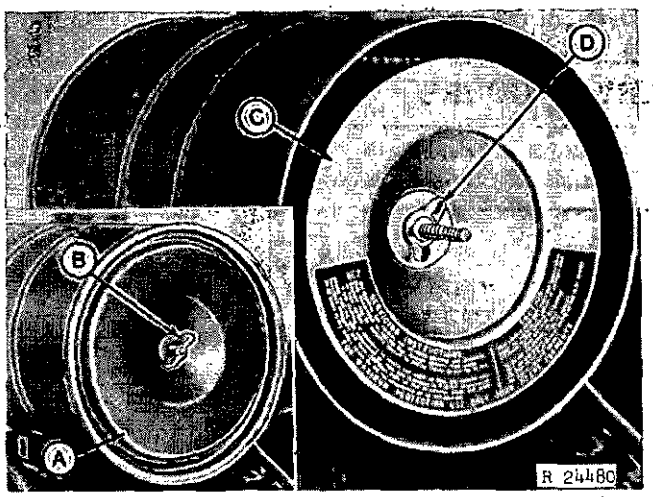
ANNUAL SERVICE

A-1	Cooling system	Drain, flush, and fill	See page 20.	.....
A-2	Air cleaner	Replace elements	See page 13.	.....

DETAILED PERIODIC SERVICES

AS REQUIRED

AR-1. Cleaning Dry Air Cleaner Filter



A—Cover **C—Primary Element**
B—Wing Nut **D—Wing Bolt**

Typical Air Cleaner

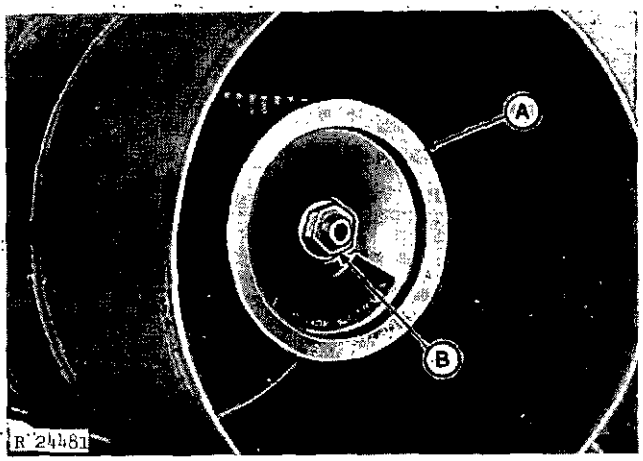
Whenever a restricted air cleaner is indicated by loss of power or excessive smoke, check the element and service if necessary.

Remove the air cleaner cover. Remove the wing bolt and primary filter element. Wipe clean the inside of the cleaner body. If the primary element is dry and dusty, clean the element as instructed with compressed air or water. If the element is oily or sooty, wash the element in filter element cleaner solution.

When a secondary element is used, both filter elements must be in place before operating the engine.

The secondary element catches particles that pass through a ruptured primary filter element or around a defective seal. Remove the secondary element only when it is to be replaced. Never attempt to clean a secondary element. Install a new element if it causes excessive restriction or after one year of service. Excessive restriction is indicated by short intervals between cleaning of the primary filter element (one not clogged by soot).

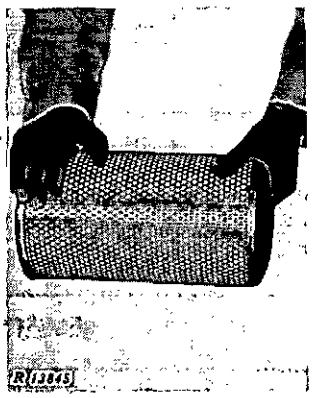
When replacing a secondary element, remove the retaining nut and element. Install the new element, making sure it is sealed at the gasket and at the retaining nut.



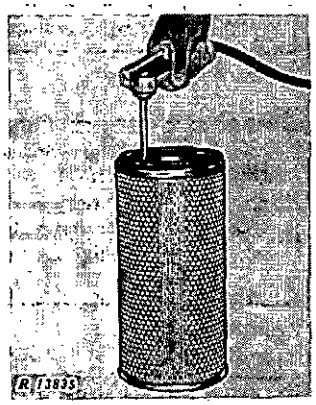
A—Secondary Element **B—Retaining Nut**

Temporary Field Service

When the element must be serviced in the field, pat the side of the element gently near the end with the palm of your hand as a temporary service. Rotate the element when patting, so the entire circumference is covered. Do not tap the element against a tire or hard surface as this may dent or rupture the element.



Patting Element



Air-Cleaning Element

Cleaning Element with Compressed Air

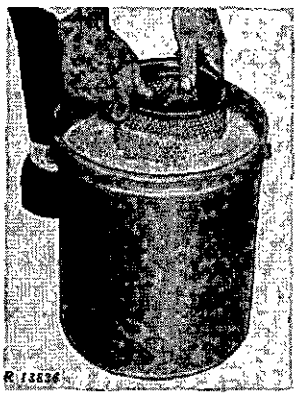
Use the John Deere AR62377 Dry Element Cleaning Gun with compressed air and insert the cleaning gun as illustrated. Hold the air nozzle near the inside of the perforated sheet metal retainer and squeeze the handle. Air is forced out through the element from the inside. Move the gun up and down the pleats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

IMPORTANT: Do not blow air from the outside to the inside or attempt to dust off the outside of the element with the air nozzle.

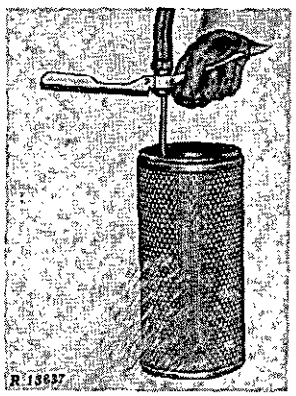
Pat the element lightly with the palm of your hand as instructed under temporary field service. Additional dirt will be loosened. Repeat the cleaning gun process. Inspect the element after cleaning.

Cleaning Element with Water

Clean as much dirt from the element as possible with compressed air. Attach a garden hose to the receptacle portion of the cleaning gun using a rubber washer between gun and hose. Do not exceed 40 psi (2.5 bar) (2.5 kg/cm²) water pressure. Flush dirt from the element by forcing water out from the inside as shown. Allow the element to dry completely, and inspect the element before installing it.



Washing Element



Rinsing Element

Cleaning Sooty or Oily Elements

Blow dust from the element with compressed air or flush with clean water. Soak the element at least 15 minutes in a solution of warm water (no hotter than your hand can stand) and John Deere Filter Element Cleaner (Part No. R36757) or its equivalent. Gently agitate element to flush out dirt. Rinse it THOROUGHLY from the inside to the outside using the cleaning gun or a free-running hose without nozzle. Do not exceed 40 psi (2.5 bar) (2.5 kg/cm²) water pressure. Before reusing, allow the element to dry. This usually requires 1 to 3 days. Do not oven-dry or use drying agents. Temperatures above 180°F (82°C) will shorten element service life. Protect it from freezing while drying. Using compressed air may rupture a wet element. Inspect the element.

IMPORTANT: Never wash elements in gasoline, fuel oil, or similar solvents. Do not oil elements.

Inspecting Element

After cleaning the element, inspect it for damage. Place a bright light inside the filter and discard any element that shows the slightest hole or rupture. If it is to be stored for later use, place it in a plastic bag and store in an element shipping container to protect against dust and damage.

Replace the filter element when the interval between cleanings becomes short, indicating that the element is not responding to cleaning or after one year of service. If filter gasket is missing or damaged, replace the element. If wing screw gasket is damaged or missing, replace the gasket.

Install and secure the element in place with wing screw and gasket washer. Be sure gasket washer is in good condition and is against the element. Install the cover. Never operate the engine without the filter elements.

AR-2. Replacing Fuel Filter

Replace the filter whenever necessary to maintain an adequate flow of fuel to maintain full engine horsepower. See page 18.

AR-3. Cleaning Fuel Injection Nozzles

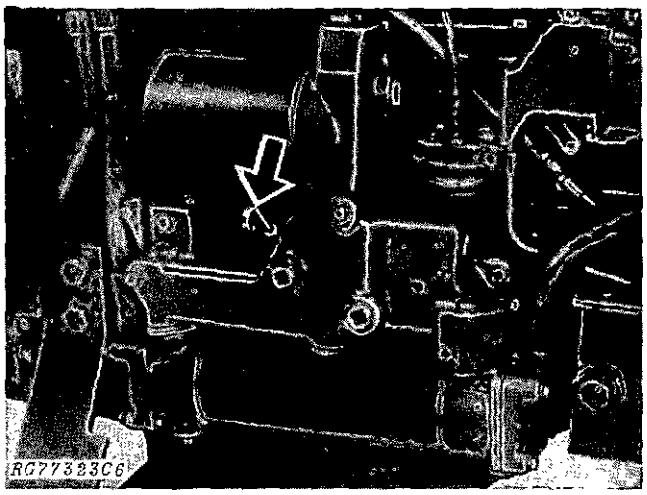
Whenever faulty or dirty injection nozzles are indicated by abnormal engine operation, see your John Deere dealer.

AR-4. Checking Injection Pump Timing

Whenever faulty injection pump timing or operation is indicated by abnormal engine operation, see your John Deere dealer.

DAILY OR 10-HOUR SERVICE

10-1. Checking Engine Crankcase Oil Level



Oil Dipstick Location
(6619A Shown)

With the engine stopped for 10 minutes or more, remove the crankcase dipstick. Observe the engine oil level with the dipstick seated evenly on the dipstick tube. If the oil level is down to the lower mark on the dipstick, add sufficient oil of the proper viscosity and quality to bring the oil level to the upper mark.

10-2. Checking Radiator Coolant Level

CAUTION: Remove the radiator filler cap only when the coolant temperature is below the boiling point. The gauge pointer should be to the left of the vertical position. Then loosen the cap slightly to the stop to relieve pressure before removing the cap completely.

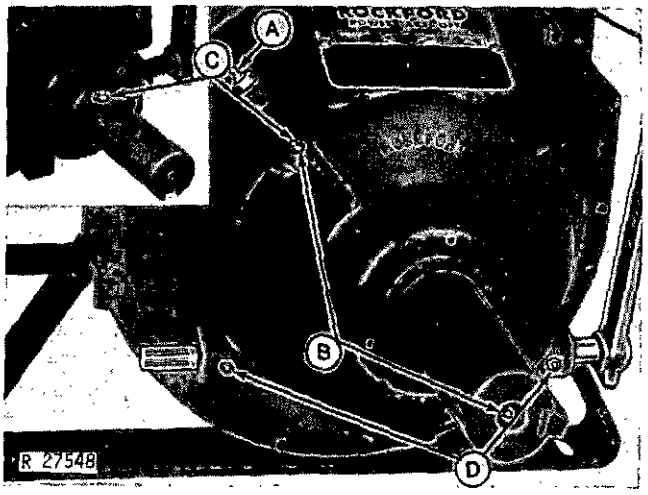
Remove the radiator filler cap and check the coolant level. Coolant should be 1-1/2 inches (35 mm) above the baffle in the radiator. If necessary, add coolant solution (described on page 20) to bring coolant up to the proper level.

Check the cooling system for loose connections or leaks after adding coolant. If pressure is not maintained, loss of coolant and overheating will result. Tighten the filler cap.

10-3. Checking Fuel Filter

Check filter for sediment or water. If any is present, drain it out and bleed the filter as instructed on page 18.

10-4. Lubricating PTO Clutch Release Bearing



A—Release Bearing Grease Fitting
B—Fittings for Side-Loaded Drive
C—Fittings for In-Line Drive
D—Lever Shaft

Apply one shot of John Deere Multi-Purpose Lubricant or its equivalent at release bearing grease fitting (A) each day.

50-HOUR SERVICE

Perform the items in the daily or 10-hour service in addition to the following.

50-1. Lubricating PTO Clutch Shaft Bearings and Lever Shaft

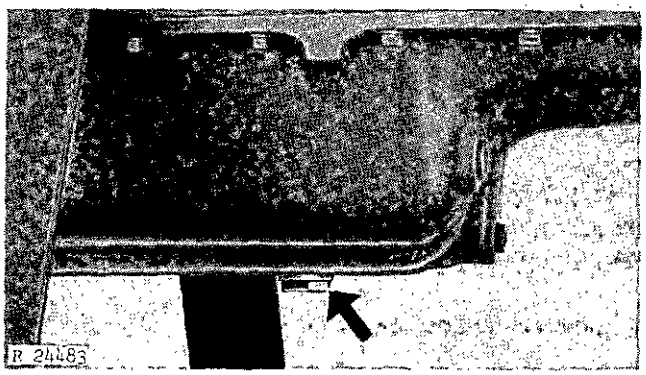
Apply one or two shots of John Deere Multi-Purpose Lubricant or its equivalent to the drive shaft bearing grease fittings (B or C).

Apply one shot of grease at each of the lever shaft grease fittings (D).

100-HOUR SERVICE

Perform the items in the daily or 10-hour service in addition to the following.

100-1. Draining and Filling Crankcase



With the engine warm, remove the crankcase drain plug and drain oil from the crankcase. Remove the filter drain plug and drain oil from the filter housing. On 6619A Engines, remove the cooler drain plug and drain oil from the cooler.

Install the drain plugs and add new John Deere Torq-Gard Supreme Engine Oil or its equivalent. See page 10 for proper viscosity or equivalent oil. Crankcase oil capacity without filter change is approximately 2 U.S. quarts (2 L) less than that required with filter change. Check the drain plugs for leaks. The oil level should be at the upper mark on dipstick ten minutes after stopping.

Crankcase oil capacity with filter change is:
6466D, T Engine — 16 U.S. quarts (15 L)
6466A Engine — 21 U.S. quarts (20 L)
6619A Engine — 24 U.S. quarts (23 L)

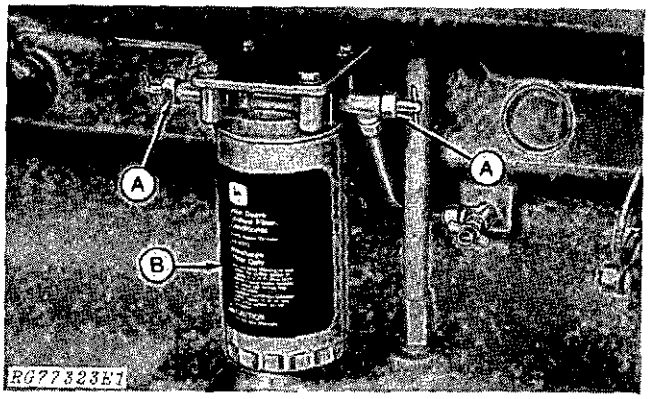
NOTE: 6466 engines may be equipped with a "deep-sump" oil pan. If so, oil capacity with filter change is 21 U.S. quarts (20 L).

IMPORTANT: Running a turbocharged engine at high speeds with the oil pressure too low will probably damage the turbocharger.

Keep a record of all oil and filter changes on the oil and filter change stickers that come with the filters.

100-2. Changing Coolant Filter Conditioner (6619A Engine)

After the *first* 100 hours, the precharged coolant filter conditioner must be replaced with a service coolant filter conditioner.



A—Filter Valves **B—Filter Element**

Coolant Filter (6619A Engine)

CAUTION: Do Not change filter element when engine is hot.

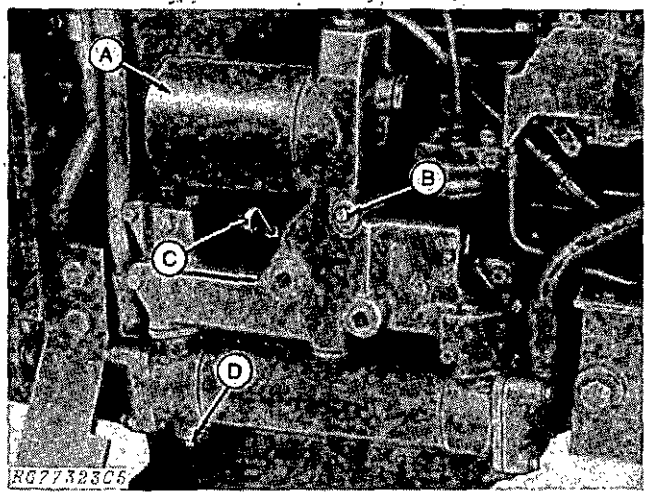
Close the filter valves (A) and remove the filter element (B) by turning it counterclockwise. Clean the filter mounting pad. Apply a thin film of oil to the gasket and tighten the new filter element until it contacts the mounting pad. Then tighten it an additional 1/2 to 3/4 turns. Open the filter valves.

200-HOUR SERVICE

Perform the items in the daily or 10-hour service and the 100-hour service in addition to the following.

200-1. Changing Crankcase Oil Filter

Drain the crankcase oil as instructed in service item 100-1.



A—Filter **C—Dipstick**
B—Filter Drain Plug **D—Cooler Drain Plug**

Crankcase Oil Filter (6619A Shown)

Remove the filter drain plug (B) to drain the filter, then remove the filter element (A) by twisting it counterclockwise. Clean the filter mounting pad. If necessary, replace the sealing ring. Apply a thin film of oil to the sealing ring, and screw the new element into place. Hand tighten only.

Install crankcase drain plug and filter drain plug, and fill the crankcase with John Deere Torq-Gard Supreme engine oil or its equivalent.

Run engine to check for leaks.

After engine has been stopped for about 10 minutes, check oil level. It should be to upper mark on dipstick.

200-2. Changing Coolant Filter Conditioner (6619A Engine)

Replace the Service Coolant Filter Conditioner as instructed in service item 100-2.

200-3. Checking Fan Belt Tension

Check the belt tension as instructed on page 23.

200-4. Servicing the Batteries

Clean the batteries and check the electrolyte level of each battery cell. See page 22.

200-5. Checking Power Take-off Clutch Adjustment

Check and if necessary adjust clutch engagement force. See page 26.

600-HOUR SERVICE

Perform the items in the daily or 10-hour service, the 100-hour service, and the 200-hour service in addition to the following.

600-1. Checking Air Cleaner Connections

Check the clamps on the hoses which connect the air cleaner to the engine. Tighten the hose connections where necessary. This will help to prevent dirt from entering through loose connections.

600-2. Checking Valve Clearance

See your John Deere dealer for this service.

600-3. Checking Engine Speeds

Check engine speeds to make sure governor is working properly.

On 6466D and 6466T engines, rated speed is 2200 rpm. On 6466A and 6619 engines, rated speed is 2100 rpm.

Rated speed is at full throttle and full load. At full throttle and no load, speed may be approximately 60-200 rpm higher.

Slow idle speed should be 800 rpm.

If engine speeds need to be adjusted, consult your John Deere dealer.

600-4. Lubricate Power Take-off Clutch Internal Levers and Linkage

Lubricate the internal linkage as instructed on page 26.

ANNUAL SERVICE

Once each year, perform the following services. If the engine is to be stored, use the "Storage" instructions on page 27.

A-1. Cleaning the Cooling System

Drain, clean, flush, and refill the cooling system as instructed on page 20.

A-2. Replacing Air Cleaner Filter Elements

The air cleaner primary filter element and the secondary element should be replaced once each year or more often if the interval between cleanings becomes short. (May be extended to two years if operation is in cool, dust free area.) See Item AR-1 on page 13.

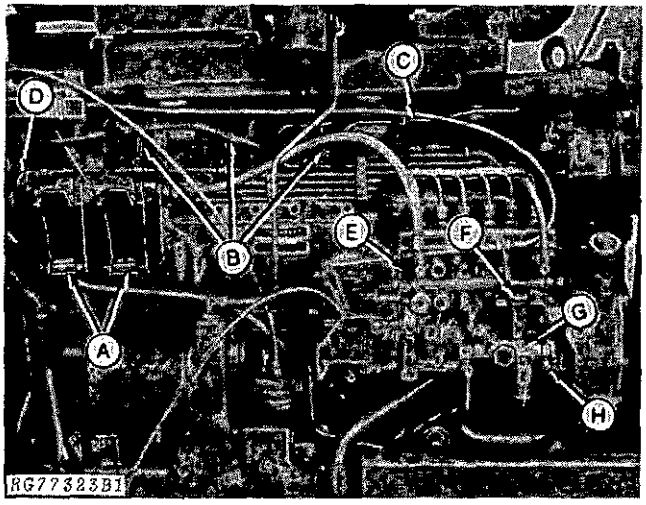
Service

The instructions on the following pages will help you keep your John Deere engine performing efficiently and economically.

Your John Deere dealer offers complete engine service. His factory trained personnel have access to accurate, detailed service information. Some of the dealer services are listed below.

(1) Engine tune-up.
(2) Injection pump and nozzle service.
(3) Electrical system checks.
(4) Fuel system service.
(5) Cooling system service.
(6) Parts service.

DIESEL FUEL SYSTEM



A—Fuel Filters
B—Injection Nozzles
C—Throttle Cable
D—Leak-Off Outlet
E—Injection Pump
F—Hand Primer
G—Fuel Pump
H—Inlet

Diesel Fuel System (6619A Shown)

Description

The diesel fuel system consists of the fuel tank, fuel pump (G), fuel filter (A), injection pump (E), fuel injection nozzles (B) and the connecting pipes. Do not run the engine while steam cleaning or washing near the injection pump. The sudden temperature change when the engine is running can cause pump damage.

Modification or alteration of the injection pump, the injection pump timing, or the fuel injectors in ways not recommended by the manufacturer will terminate the warranty obligation to the purchaser. See your copy of the John Deere Warranty for this engine.

Inspection and Cleaning

Proper servicing of the fuel system is important. The fuel system of turbocharged engines has a fuel pump sediment bowl at the injection pump. Visually inspect the fuel pump sediment bowl (if equipped) and the fuel filters daily or after every ten hours of operation.

If there is water or foreign matter in the fuel pump sediment bowl, close the fuel tank shut-off valve and remove the sediment bowl. Clean the bowl and strainer. Install the bowl and strainer using a good gasket. Open the shut-off valve, and bleed the filters.

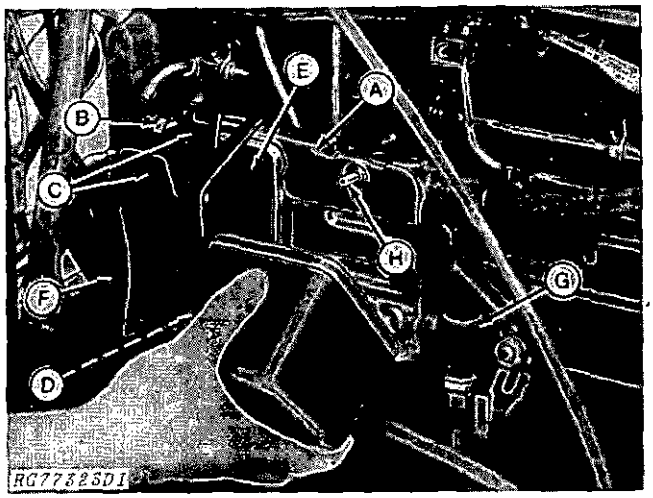
If there is water or foreign matter at the bottom of a fuel filter, loosen the drain plug for that filter and drain the water or foreign matter from the filter. Bleed the filters.

If water was present in the fuel pump sediment bowl or a fuel filter sediment chamber, drain all the water from the fuel tank sump to eliminate clogging filter.

Improper fuel storage may necessitate frequent cleaning of the fuel system. After correcting the cause of contaminated fuel, drain or clean the fuel tank sump, the fuel pump sediment bowl, and the fuel filters. Have your dealer check the fuel system.

Replacing Filter Element

On turbocharged engines, two fuel filters connected in parallel prevent dirty fuel from reaching the fuel injection pump and the fuel injectors. Non-turbocharged engines are equipped with a single fuel filter. Each filter has a dual stage element. The filters will require occasional replacement in pairs to maintain an adequate flow of fuel to the injection pump for full engine power. The frequency of this service will be determined by the cleanliness of available fuel and the care used in fuel storage.



A—Filter Body
B—Bleed Plug
C—Finger Tabs
D—Drain Plug
E—Filter Element
F—Filter Retaining Spring
G—Check Valve
H—Spring Pin

To release the filter retaining spring (F), press inward on the tab (C) to disengage the top hook of the spring. Pull filter off and push new filter over the spring pin (H). Hook the bottom of the filter retaining spring first and the top last.

IMPORTANT: Any dirt lodged in the spring pin groove (H) 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.

The fuel line is equipped with a check valve (G) to prevent fuel leaking back into the tank. Hard starting could be caused by a leaking check valve. If this occurs, replace the check valve.

Fuel Injection Nozzles

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

IMPORTANT: Do not attempt to remove and disassemble injection nozzles. Special tools are required.

Bleeding Fuel System

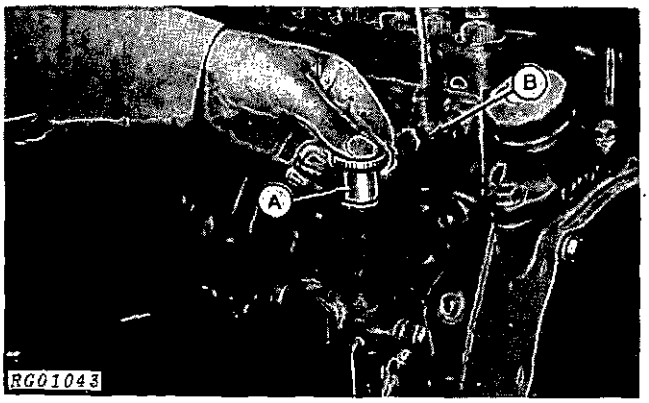
CAUTION: Escaping diesel fuel under pressure can have sufficient force to penetrate the skin, causing serious personal injury. Before disconnecting lines, be sure to relieve all pressure. Before applying pressure to the system, be sure all connections are tight and that lines, pipes and hoses are not 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. Serious infection or reaction can develop if proper medical treatment is not administered immediately.

When the fuel pump sediment bowl or the fuel filter is removed or the engine runs out of fuel, bleed the air from the fuel filter.

Turbocharged Engine



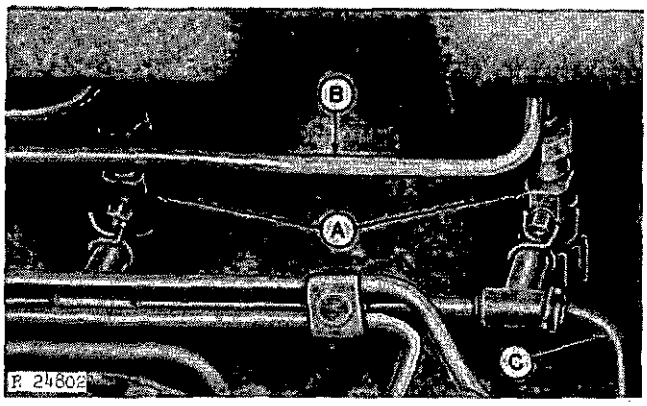
A—Hand Primer
B—Return Line Fitting

On a turbocharged engine, loosen the hand primer (A) at the injection pump until it can be pulled upward. Pump the hand primer until most of the air bubbles in the filters are gone. Push the primer downward and tighten it.

If it is necessary to bleed the entire system, first bleed the filters. Then, bleed the injection pump by loosening the injection pump return line fitting (B) and pumping the hand primer until fuel without air comes from the fitting. Tighten the fitting.

If the engine will not start, it may be necessary to bleed the injection pipes by loosening the high pressure fuel pipes at the injection nozzles. With the hand throttle in the slow idle position, turn the engine with the starter until fuel without air flows from the loose connections. Tighten the connections.

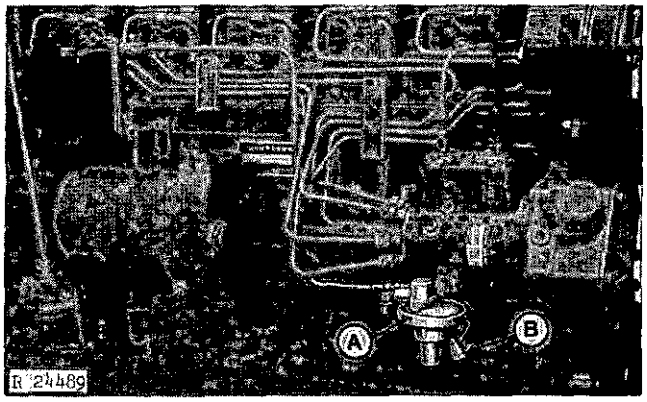
Bleeding Fuel System—Continued



A—Fuel Injection Nozzles
B—High Pressure Fuel Pipe
C—Fuel Leak-Off Pipe

Fuel Injection Nozzles

Engine Without Turbocharger



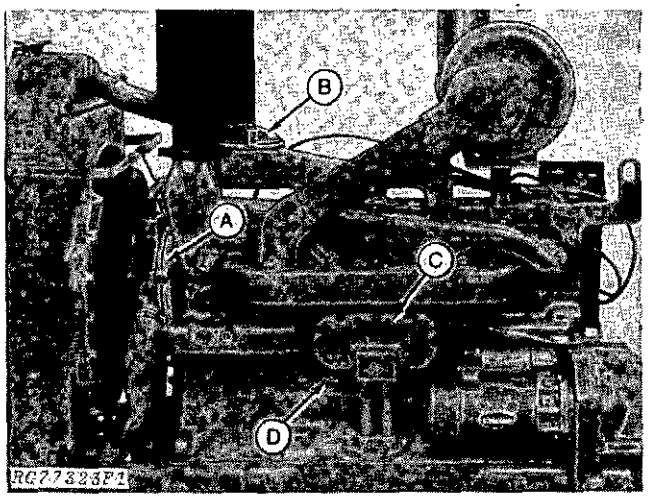
A—Fuel Pump
B—Hand Primer

Hand Primer Pump (6466D)

To bleed air from the filter, open the bleed plug on the filter body and operate the hand primer (B) on the fuel pump until the air bubbles disappear and fuel flows from the bleed plug, then close the bleed plug. If the primer does not pump fuel and no resistance is felt at the upper portion of the lever stroke, turn the engine with the starter to change the fuel pump cam position. Leave the primer lever in its lowest position.

If the engine fails to start after bleeding the filters, bleed the entire fuel system. First, bleed the filters, then loosen the injection pipes at the injection nozzles. With the hand throttle about 1/2 way out, turn the engine with the starter until fuel without air flows from the loose connections. Tighten the connections.

COOLING SYSTEM



A—Water Pump
B—Water Manifold
C—Oil Cooler
D—Drain Cock

Cooling System
(6466D Stationary Engine)

Description

The cooling system consists of the radiator, radiator hoses, water manifold, thermostats, water bypass pipes, in-block coolant heater (optional), and coolant passages within the cylinder head and block. The 6619A Engine is also equipped with a coolant filter conditioner.

The cooling system is pressurized and all components must be tight and in good condition for proper operation. Loss of pressure will result in overheating and loss of coolant.

⚠ CAUTION: Remove the radiator filler cap only when the coolant temperature is below the boiling point. Then loosen the cap slightly to the stop to relieve pressure before removing the cap completely.

Cleaning Cooling System—6466 Engines

Examine all air passages in the radiator core. Remove all chaff and dirt from the radiator. Straighten bent fins.

For efficient operation, the cooling system should be drained, flushed, and filled once each year.

To perform this service, drain the system by opening the drain cocks on the engine block and radiator.

Remove the thermostat cover retaining cap screws. Lift the thermostat cover and remove the thermostats. Install the thermostat cover and close the engine block and radiator drain fittings. Fill the system with clean water.

Run the engine about 10 minutes to stir up possible rust or sediment. Stop the engine and drain the coolant from the system before the rust or sediment settles.

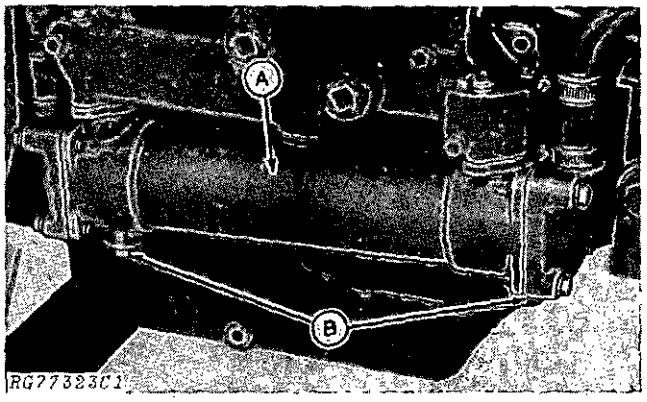
Close the drains. Fill the cooling system with a good commercial radiator cleaner and water. Follow the instructions with the cleaner.

After cleaning the cooling system, fill it with water to FLUSH the system. Install the filler cap and run the engine about 10 minutes, then drain out this flushing water.

Remove the cover and install the thermostats. Install the cover, close the drains and fill the cooling system. Use a minimum of 10% ethylene glycol antifreeze and 90% CLEAN, SOFT WATER. A 50-50 solution, however, is recommended for maximum cooling system protection.

Cleaning Cooling System—6619A Engine

Drain the block and radiator as instructed for 6466 Engines.

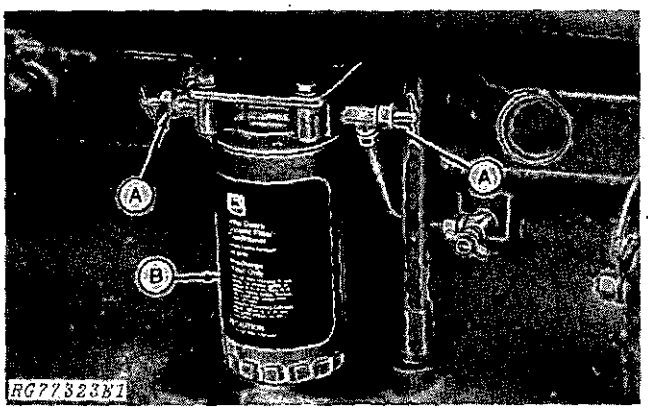


A—Oil Cooler **B—Coolant Drain Plugs**

Oil Cooler Drain Plugs

Remove the plugs (B) and drain the engine oil cooler.

Remove the thermostat cover retaining cap screws. Lift the thermostat cover and remove the thermostats. Install the thermostat cover, and engine oil cooler drain plugs and close the engine block and radiator drain cocks.



A—Coolant Filter Valves **B—Coolant Filter Element**

6619A Coolant Filter Conditioner

Close the coolant filter valves (A) and remove the coolant filter element. Fill the cooling system with clean water.

Run the engine about 10 minutes to stir up possible rust or sediment. Stop the engine and drain the coolant from the system before the rust or sediment settles.

Close the drains. Fill the cooling system with a good commercial radiator cleaner and water. Follow the instructions with the cleaner.

After cleaning the cooling system, fill it with water to FLUSH the system. Install the filler cap and run the engine about 10 minutes, then drain out this flushing water. Open the coolant filter valves to drain the lines.

Remove the cover and install the thermostats. Install the cover and close the block and radiator drains. Be sure the two drain plugs on the engine oil cooler are in place.

Install a new precharged coolant filter conditioner element. Lubricate the gasket and tighten the filter until it contacts the mounting base. Then tighten it an additional 1/2 to 3/4 turn.

Fill the cooling system, using a minimum solution of 10% ethylene glycol antifreeze and 90% CLEAN, SOFT WATER. A 50-50 solution, however, is recommended for maximum cooling system protection.

IMPORTANT: DO NOT use John Deere Summer Coolant Conditioner or any antifreeze containing a stop-leak additive. They may clog the coolant filter.

Do not use a methoxy propanol antifreeze (such as Dowtherm 209 antifreeze or its equivalent), as it is not compatible with the coolant filter chemicals.

Cleaning Cooling System—6619A Engine—Continued

If the cooling system loses up to 1 gallon (3.8 L) of coolant, replace the lost coolant solution only. If the system loses from 1 gallon (3.8 L) to 1/3 of the system capacity, replace the lost coolant solution and install a new service filter element. If more than 1/3 of the system capacity is lost, replace the lost coolant solution and install a new precharge filter. Be sure to replace the precharge filter with a service filter after 100 hours operation.

Maintaining Cooling System—All Engines

Well water or tap water usually contains impurities which can corrode, cause rusting, or clog a cooling system and reduce cooling system efficiency. In some areas of the country, these impurities will soon damage a cooling system. See your John Deere dealer for complete cooling system care.

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

Preparing for Cold Weather

Prior to freezing weather, be sure to drain and flush the cooling system. Fill the system with a recognized brand of antifreeze solution to eliminate the need for daily filling and draining of the cooling system.

Antifreeze

Use only ethylene glycol (permanent type) antifreeze which contains a rust inhibitor but does not contain a stop-leak additive. This is very important on the 6619A Engine.

After adding the antifreeze solution, run the engine until it reaches operating temperature to allow the thermostats to open. This will make sure that the solution is circulated throughout the entire cooling system.

Draining

IMPORTANT: If the cooling system is drained to prevent freezing, be sure to drain the engine oil cooler on 6619A engines as well as the radiator and the engine block.

ELECTRICAL SYSTEM

Batteries

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

Typical starting current required at 70°F (21°C) is approximately 600 amps for 6619 Engines or 400 amps for 6466 Engines. More current is required at higher or lower temperatures.

⚠ CAUTION: Keep all sparks or open flames away from the batteries. The gas from the electrolyte is highly flammable. To avoid sparks when using booster batteries, make the last connection or the first disconnections away from the batteries. Severe damage or burns will be caused if some parts of the electrical system are grounded or short-circuited. WHEN SERVICING THE ELECTRICAL SYSTEM, DISCONNECT THE BATTERY GROUND.

Cleaning Batteries

Keep the batteries clean by wiping them off with a damp cloth after every 200 hours of operation or whenever dirt appears excessive.

If corrosion is present around the terminal connections, remove it and wash the terminals with an ammonia solution or a solution of baking soda and water. Be sure the vent plugs are tight to prevent cleaning solution from entering the cells.

After cleaning, flush the outside of the battery and battery compartment with clear water. Examine the vent hole in each battery cap to make sure they all are open.

Checking Specific Gravity

Use a battery hydrometer to check the specific gravity of the electrolyte in each battery cell. 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 (seven gravity points for every 10°C above 27°C) or subtracting four gravity points for every ten degrees below 80°F (seven gravity points for every 10°C below 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 200 hours of operation. Fill the battery cells to the bottom of the filler neck. Use distilled water. 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 (2 or 3 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.

Connecting Batteries

Disconnect the battery ground cable first; then, disconnect the positive battery cable.

When connecting battery cables, connect positive cable first; then connect negative ground cable. Tighten clamps securely. Coat terminals and connectors with a mixture of petroleum jelly and baking soda to retard corrosion.

Storing Batteries

If the batteries will not be used for more than 30 days, remove them. With the electrolyte level at the bottom of the split ring, charge the batteries before storing them. Recharge the batteries after every 30 days they are in storage. To minimize self-discharge, store the batteries in as cool a place as possible so long as the electrolyte does not freeze. Electrolyte at 1.220 specific gravity (corrected reading) will freeze at −31°F (−35°C).

Alternator and Regulator

The alternator located at the right-hand front side of the engine provides electrical current for charging the batteries and for other electrical requirements. A transistorized alternator regulator is mounted at the rear of the alternator. The regulator controls the voltage output of the alternator.

Preventing Damage to Alternator and Regulator

When the batteries are connected, observe the following items. Failure to observe them will probably result in damage to the regulator, alternator, or both.

(1) Never attempt to polarize an alternator.
(2) Disconnect the batteries when working near or on the regulator or alternator.
(3) If either the regulator or alternator wiring is disconnected, be sure that it is properly connected BEFORE the batteries are connected.
(4) The alternator field circuit between the alternator and regulator must never be grounded when the key switch is on or the engine is running.
(5) Never ground the alternator output terminal or the circuit between the alternator and the battery.
(6) The alternator must not be operated on an open circuit (batteries disconnected or with a broken or disconnected wire between the alternator and batteries). The high voltage resulting from open circuit operation may damage the alternator or regulator.

Adjusting Belt Tension

Check belt tension every 200 hours. If necessary, adjust, using a Burroughs BT-33-73 Belt Tension Gauge or equivalent, following the manufacturers' instructions.

Loosen alternator mounting bolts. Apply an outward force to the front half of the alternator until belt tension is correct (see Table). Tighten alternator mounting bolts.

	New Belt	Belt In Service*
1-belt system	130-140 lbs. (578-622 N)	85-94 lbs. (378-423 N)
2-belt system (Tension front belt only)	94-104 lbs. (423-467 N)	

**Any belt that has been run more than 10 minutes.*

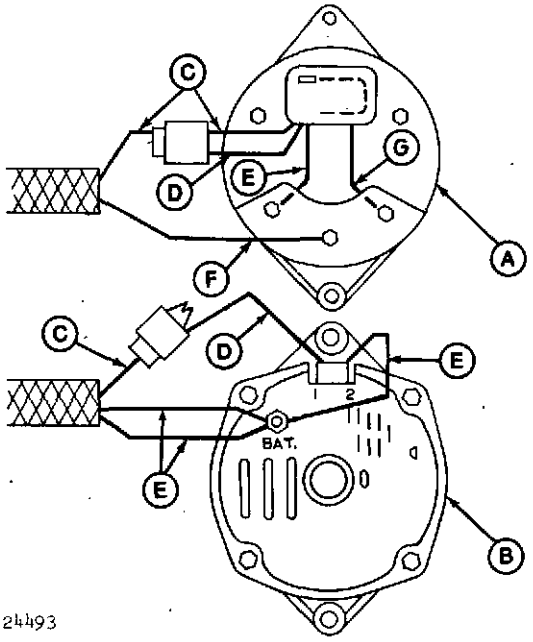
IMPORTANT: Do not tension or release belts when hot.

After installing a new belt, run engine for about 10 minutes. Stop engine and check belt tension. If tension is not within New Belt limits, wait 10 minutes, loosen belt and set to Belt In Service specifications.

When either belt needs replacing on a 2-belt system, install two new belts. The belts must be a matched set to obtain satisfactory service life.

Alternator-Regulator Connections

If, for any reason, the alternator and regulator are disconnected, connect them as shown.



A—Motorola Alternator
B—Delco-Remy Alternator
C—Purple
D—Orange
E—Red
F—Red or Black
G—Black
H—Green (To Brush Holder)

Alternator-Regulator Connections

Fuses

The electrical system controlled by the key switch is protected by a MDL-25 amp fuse in a fuseholder between the ammeter and the key switch.

On turbocharged engines, the RP-20 rack puller circuit is protected by an SFE-20 amp fuse in a fuseholder between the ammeter and the rack puller.

Starter

The engine is cranked by a heavy-duty starter, located on the left-hand side of the engine. It is built to carry a big load for a short period of time. A solenoid switch on top of the starter makes the electrical connection between the starter and the batteries.

IMPORTANT: Never operate the starter more than 30 seconds at a time. After 30 seconds, allow at least two minutes for the starter to cool. After a false start, be sure that the starter has stopped completely before attempting another start.

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

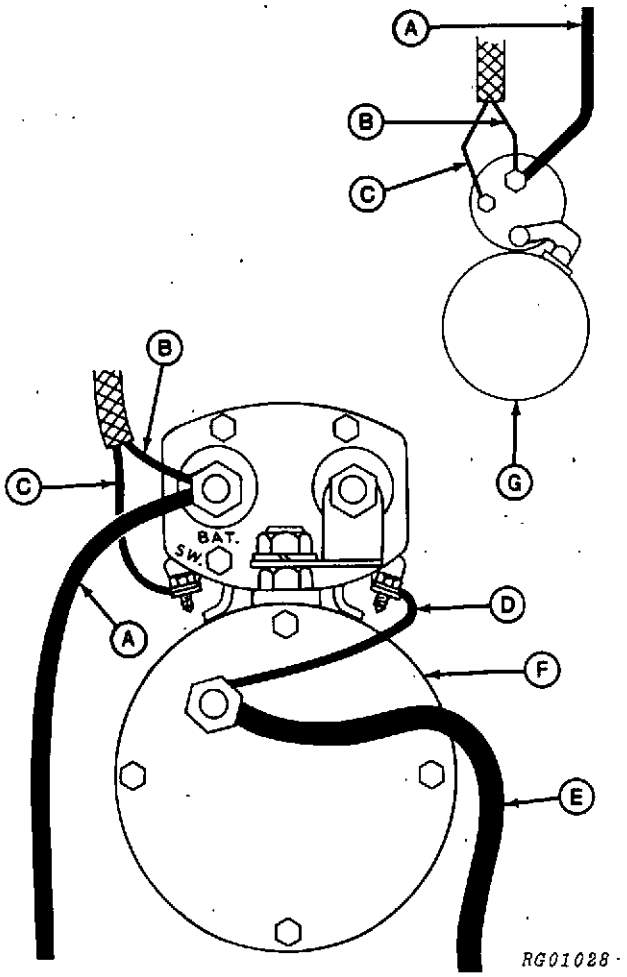
Checking Causes of Sluggish Starter

The usual causes of a sluggish starter (other than the starter itself) are run-down batteries, loose connections, defective wiring, or some condition in the engine that puts a heavier load on the starter. Check the batteries and the condition of the wiring. The wiring connections should be clean and tight. At low temperatures, be sure the engine crankcase oil is of the correct viscosity and quality.

See your John Deere dealer if these checks fail to improve starter performance.

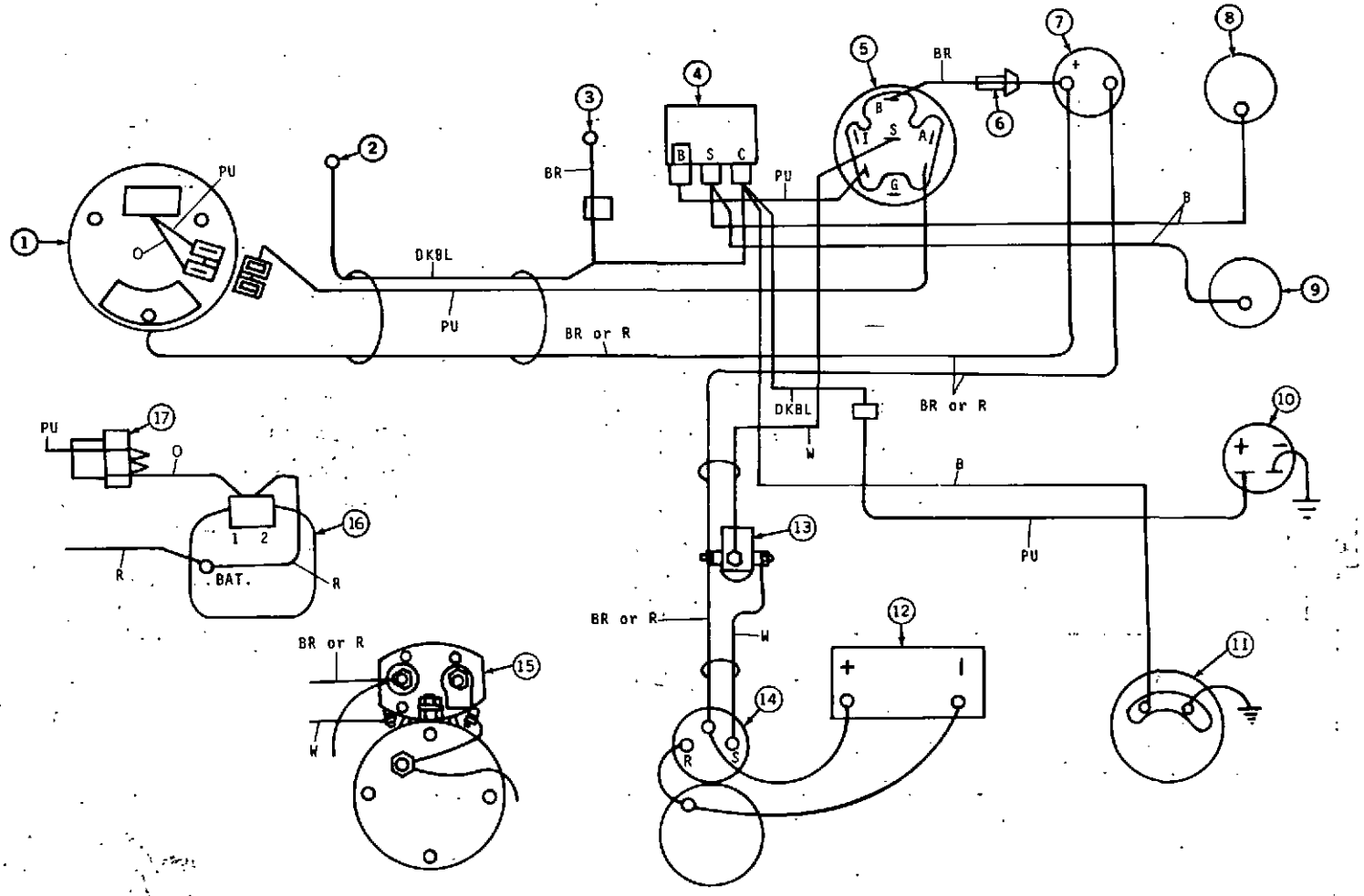
Starter-Solenoid Switch Connections

If the starter and solenoid switch wires and cables are disconnected for any reason, connect them as shown in the illustrations.



A—Positive Battery Cable
B—Red
C—White
D—Solenoid Ground Wire
E—Negative Ground Cable
F—Delco-Remy Starter
G—John Deere Starter

Starter Connections

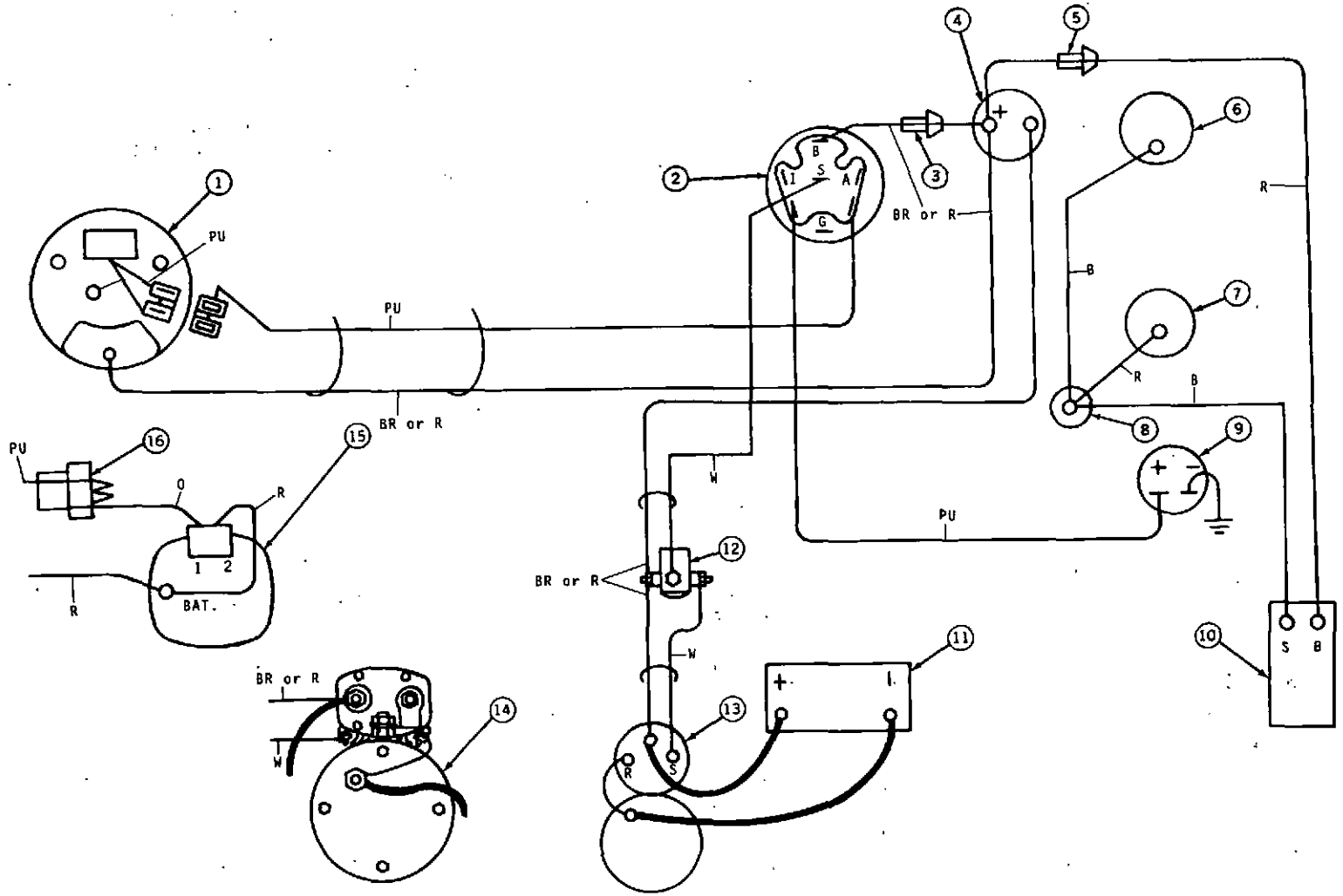


RG 1427

1—Motorola Alternator
2—To Injection Pump Solenoid (6466D)
3—This Terminal Not Used
4—Magnetic Switch with SFE 14-amp Fuse
5—Key Switch
6—Fuseholder with MDL 25-amp Fuse
7—Ammeter
8—Temperature Gauge
9—Oil Pressure Gauge
10—Hour Meter
11—RP-75 Rack Puller ("T" and "A" engines only)
12—12-Volt Battery
13—Starter Circuit Relay
14—John Deere Starter
15—Delco-Remy Starter
16—Delcotron Alternator
17—Delcotron Harness

B —Black
BR —Brown
DKBL—Dark Blue
O —Orange
PU —Purple
R —Red
W —White

Electrical Wiring Diagram-6466D; 6466T (033055-); 6466A (030293-); 6619A (026427-)



RG1426

1—Motorola Alternator
2—Key Switch
3—Fuseholder with MDL 25-amp Fuse
4—Ammeter
5—Fuseholder with MDL 25-amp Fuse
6—Temperature Gauge
7—Oil Pressure Gauge
8—Stop Button
9—Hour Meter
10—RP-20 Rack Puller
11—12-Volt Battery
12—Starter Circuit Relay
13—John Deere Starter
14—Delco-Remy Starter
15—Delcotron Alternator
16—Delcotron Harness

B —Black
BR —Brown
DKBL—Dark Blue
O —Orange
PU —Purple
R —Red
W —White

Electrical Wiring Diagram 6466T (-033054); 6466A (-030292); 6619A (-026426)

POWER TAKE-OFF CLUTCH

CAUTION: Be sure the PTO drive shaft between the clutch housing and the engine-driven equipment is shielded at all times during engine operation.

Proper performance of the power take-off unit will be related to the care that is given it. Lubricate it periodically and keep the clutch adjusted properly.

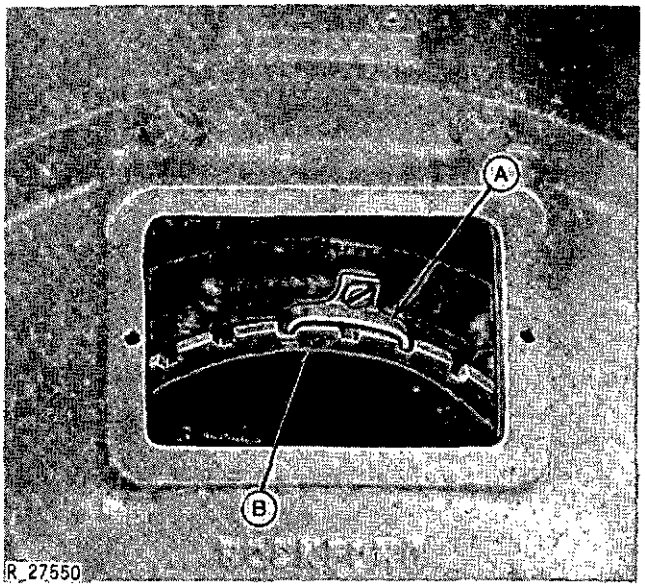
Clutch Adjustment

Clutch engagement force should be checked and, if necessary, adjusted after every 200 hours of operation.

CAUTION: Never attempt to service the PTO while it is in operation. Loose clothing could get caught in moving parts; keep clothing tight against body. Use extreme care when working around the PTO.

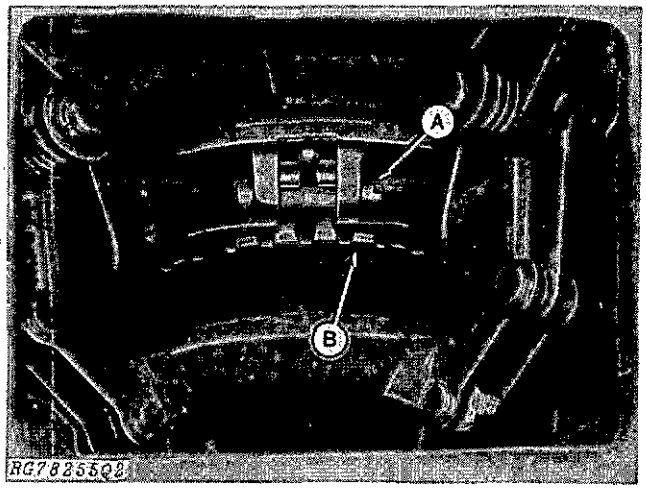
IMPORTANT: Improper adjustment of the PTO clutch might shorten clutch life. Make sure the adjustment is made properly.

NOTE: "Early" refers to 6619A engines with serial number (-026426). "Late" refers to engines with serial number (026427-)



A—Adjusting Lock **B—Adjusting Ring**

Adjusting PTO Clutch - 6406; Early 6619A



A—Adjusting Lock **B—Adjusting Ring**

Adjusting PTO Clutch - Late 6619A

(1) Remove the name plate and disengage the clutch.

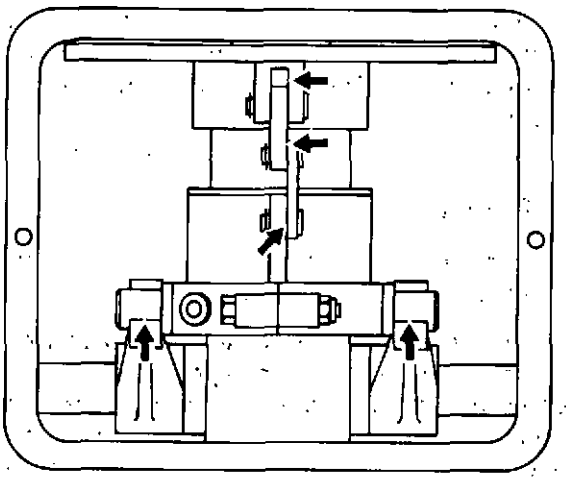
(2) On 6466 and early 6619A engines, remove the adjusting lock (A). On late 6619A, turn the adjusting lock (A) to disengage the locking cam from the clutch body.

(3) Turn the adjusting ring (B) to adjust clutch lever engagement force. On 6466 and early 6619A engines, the force should be 60 to 70 lbs (267 to 311 N). On late 6619A engines, the force should be 65 to 75 lbs (289 to 333 N).

(4) Lock the adjusting ring to the clutch body.

(5) Install the name plate.

Linkage Lubrication



Power Take-Off Linkage Lubrication

The clutch linkage should be lubricated every 600 hours with engine oil.

Remove the housing cover and apply one or two drops of oil to each of the points indicated.

Replace the housing cover.

Storage

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

STORING THE ENGINE

6466 Engines

Drain, flush and fill the cooling system. Use clean soft water and John Deere Summer Coolant Conditioner (T19566T) or if freezing weather is anticipated, add enough antifreeze to protect the cooling system from freezing. Run the engine at half throttle for about 10 minutes to circulate the coolant. This procedure should also be followed if the engine has been operating with a heat exchanger system. This procedure will protect the internal passages of the engine cooling system.

If cooling system is to be drained for storage, be sure system is first coated with a rust preventative such as T19566 John Deere Coolant Conditioner. Run engine to circulate conditioner before draining.

6619 Engines

The 6619 cooling system does not need flushing if the coolant filter has been serviced as recommended in this manual. DO NOT use John Deere T19566 Summer Coolant Conditioner in a 6619 engine, as it may clog the coolant filter. The chemicals in a properly serviced 6619 cooling system will also protect the system from rusting if it is drained for storage. The plugs at each end of engine oil cooler must be removed to completely drain the cooling system. Leave these plugs out until the engine is returned to service.

All Engines

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.

Service the air cleaner. (See page 13.)

Drain the fuel tank and add one ounce (30 ml) of inhibitor to the diesel fuel tank for each four gallons (15 L) of tank capacity.

Add 1 ounce (30 ml) of inhibitor to the engine crankcase for each quart (0.95 L) of crankcase oil.

Disconnect the air intake pipe from the manifold. Place three ounces (90 ml) of inhibitor in the manifold. Reconnect the air intake pipe. Turn engine two revolutions with the starter, holding fuel shut-off to prevent engine from starting.

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

Remove the fan belt from the alternator pulley.

Remove, clean and store the battery as instructed on page 23.

Coat with a grease or corrosion preventative all exposed metal surfaces.

Disengage the clutch.

Clean the exterior of the engine and touch up any 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 (page 23). Adjust the alternator belt tension (page 24).

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. On a 6619 engine, if 1 to 4 gallons (3.8 to 15 L) are added, install a new coolant service filter element. If more than 4 gallons (15 L) is added, install a new precharged filter element.

To help maintain power and efficiency of the engine, perform the recommended 600 hour service.

Operate the engine 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.

ENGINE

Engine Hard to Start or Will Not Start

Improper Starting Procedure.

No fuel.

Low battery output.
Check electrolyte level and specific gravity of each battery. Page 22 and 23.

Excessive resistance in starting circuit.
Clean and tighten all connections on batteries and starter. Page 22.

Fuel shut-off not operating (6466D).
Turn on key switch. Check for audible click at injection pump. If not corrected see your dealer.

Crankcase oil too heavy.
Use oil of proper viscosity. Page 10.

Improper type of fuel.
Consult fuel supplier and use proper type of fuel for operating conditions. Page 9.

Water, dirt, or air in fuel system.
Drain, flush, fill and bleed system. Page 19.

Clogged fuel filter.
Replace filter element. Page 18.

Dirty or faulty fuel injection nozzles.
Have your John Deere dealer check the fuel injection nozzles.

Clogged air cleaner.
Clean air cleaner. Page 13.

Engine Runs Irregularly or Stalls Frequently

Low coolant temperature.
Remove and check thermostat.

Clogged fuel filter.
Replace filter element. Page 18.

Water, dirt, or air in fuel system.
Drain, flush, fill and bleed system. Page 19.

Dirty or faulty fuel injection nozzles.
Have your John Deere dealer check the fuel injection nozzles.

Speed advance not working (6466D).
See your John Deere dealer.

Aneroid-to-intake manifold line leaking, broken or disconnected (Turbocharged Engines)
See your John Deere dealer.

Leak-off/fuel return line restricted.
See your John Deere dealer.

Engine Knocks

Insufficient oil.
See your John Deere dealer.

Injection pump out of time.
See your John Deere dealer.

Low coolant temperature.
Remove and check thermostat.

Engine overheating.
See "Engine Overheats". Page 29.

ENGINE—Continued

Lack of Engine Power

Injection pump shut-off lever not in run position.
Adjust lever properly.
Engine overloaded.
Reduce load.
Intake air restriction.
Service air cleaner. Page 13.
Improper type of fuel. Page 9.
Overheated engine.
See "Engine Overheats", below.
Below normal engine temperature.
Remove and check thermostat.
Improper valve clearance.
See your John Deere dealer.
Injection pump out of time.
See your John Deere dealer.
Also see "Engine Runs Irregularly or Stalls Frequently". Page 30.

Below Normal Engine Temperature

Defective thermostat.
Remove and check thermostat.

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 24.
Dirty cooling system radiator core.
Remove all foreign matter from exterior of radiator core.
Cooling system needs flushing. Page 20.
Defective thermostat.
Remove and check thermostat.
Defective temperature gauge.
Check water temperature with thermometer and replace gauge if necessary.

High Fuel Consumption

Improper type of fuel. Page 9.
Clogged or dirty air cleaner.
Service air cleaner. Page 13.
Engine overloaded.
Reduce load.
Improper valve clearance.
See your John Deere dealer.
Injection nozzles dirty.
See your John Deere dealer.
Injection pump out of time.
See your John Deere dealer.
Engine not at proper temperture.
Check thermostats.

Engine Emits Black or Gray Exhaust Smoke

Clogged or dity air cleaner.
Service air cleaner. Page 13.
Defective muffler.
Improper type of fuel. Page 9.
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 9.
Cold engine.
Warm up engine to normal operating temperature.
Defective thermostat.
Remove and check thermostat.
Engine out of time.
See your John Deere dealer.

Low Oil Pressure

Low oil level. Page 15.
Improper type of oil.
Drain and fill crankcase with oil of the proper viscosity and quality. Pages 10 and 16.

High Oil Consumption

Crankcase oil too light.
Use proper viscosity oil. Page 10.
Oil leaks.
Check for leaks in lines and around gaskets and drain plug.

ELECTRICAL SYSTEM

Battery Will Not Charge

Loose or corroded connections.
Clean and tighten battery connections. Page 23.
Sulfated or worn-out batteries.
Check specific gravity of each battery. Page 23.
Check electrolyte level of each battery. Page 23.
Loose or defective alternator belt.
Adjust belt tension. Page 24.
Replace belt.

Starter Inoperative

Loose or corroded connections.
Clean and tighten loose connections. Page 23.
Low battery output.
Check specific gravity of each battery. Page 23.
Check electrolyte level of each battery. Page 23.
Blown fuse (MDL-25).
Replace fuse. Page 25.

Starter Cranks Slowly

Low battery output.
Batteries too small.
Battery cable too small.
Check specific gravity of each battery. Page 23.
Check electrolyte level of each battery. Page 23.
Crankcase oil too heavy. Page 10.
Loose or corroded connections.
Clean and tighten loose connections.

Entire Electrical System Does Not Function

Blown fuse.
Replace fuse. Page 26.
Faulty battery connection.
Clean and tighten connections. Page 23.
Sulfated or worn-out batteries.
Check specific gravity and electrolyte level of each battery. Page 23.

Starter and Hour Meter Function; Rest of Electrical System Does Not Function

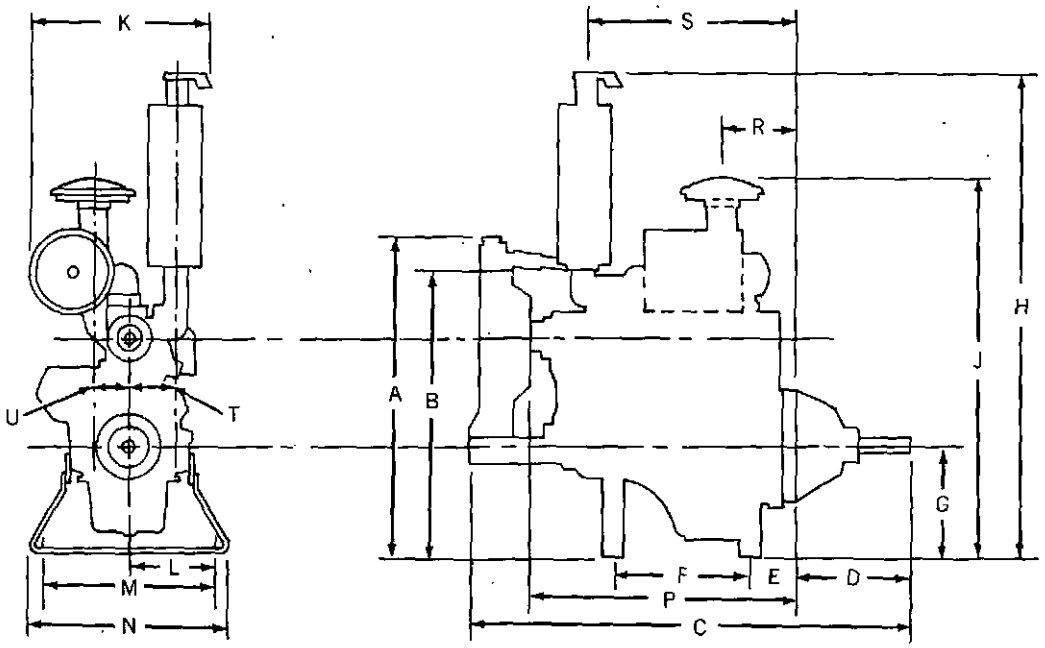
Blown fuse on magnetic switch.
Replace fuse. Page 25.

Turbocharged Engine Will Not Stop

Blown SFE-20 fuse.
Replace fuse. Page 25.

Specifications

SPECIFICATION	UNIT OF MEASURE	6466D	6466T	6466A	6619A
Number of cylinders		6	6	6	6
Fuel		Diesel	Diesel	Diesel	Diesel
Bore	in. (mm)	4.56 (116)	4.56 (116)	4.56 (116)	5.12 (130)
Stroke	in. (mm)	4.75 (121)	4.75 (121)	4.75 (121)	5.00 (127)
Displacement	cu. in. (L)	466 (7.6)	466 (7.6)	466 (7.6)	619 (10.1)
Compression Ratio		14.9:1	14.9:1	14.9:1	14.7:1
Valve Clearance					
Intake	in. (mm)	0.018 (0.46)	0.018 (0.46)	0.018 (0.46)	0.015 (0.38)
Exhaust	in. (mm)	0.028 (0.71)	0.028 (0.71)	0.028 (0.71)	0.025 (0.63)
Rated Speed	RPM	2200	2200	2200	2100
Horsepower @ rated speed without fan					
Intermittent	HP (kW)	130 (97)	157 (117)	224 (167)	275 (205)
Continuous	HP (kW)	116 (87)	133 (99)	190 (142)	232 (173)
Working Range	RPM	1500-2200	1500-2200	1500-2100	1500-2100
Low Idle	RPM	800	800	800	800
Torque (max) @ RPM without fan	ft-lbs (Nm)	351 (476) @1200	468 (635) @1500	668 (906) @1400	792 (1074) @1400
Crankcase capacity with filter change	qts. (L)	16 (15)	16 (15)	21 (20)	24 (23)
PTO shaft diameter	in. (mm)	2.25 (57)	2.25 (57)	2.5 (64)	3.5 (89)
Weight with radiator and PTO	lbs. (kg)	2275 (1032)	2350 (1066)	2445 (1109)	3300 (1497)



RG01030

A—Height To Radiator Cap
B—Height To Exhaust Elbow
C—Overall Length
D—PTO Assembly Length
E—Rear Mounting Hole To Flywheel
F—Mounting Holes Length
G —Crankshaft Height
H —Height To Top Of Muffler
J —Height To Top Of Air Cleaner
K —Width Less Radiator
K_1—Width With Radiator (Not Shown)
L —Crankshaft To Mounting Hole
M —Mounting Holes Width
N—Overall Mount Width
P—Block Length
R—Air Cleaner To Flywheel
S—Muffler To Flywheel
T—Crankshaft To Exhaust Manifold (Left)
U—Crankshaft To Air Intake (Left) (*Right)

DIMENSION IN. (mm)	6466D	6466T	6466A	6619A
A	52.0 (1321)	52.0 (1321)	52.5 (1334)	54.5 (1384)
B	45.0 (1143)	50.5 (1283)	50.5 (1283)	51.75 (1314)
C	69.0 (1753)	69.0 (1753)	70.62 (1794)	84.5 (2146)
D	15.5 (394)	15.5 (394)	16.13 (410)	23.5 (597)
E	9.3 (236)	9.3 (236)	9.3 (236)	8.32 (211)
F	28.0 (711)	28.0 (711)	28.0 (711)	25.5 (648)
G	15.0 (381)	15.0 (381)	15.0 (381)	15.0 (381)
H	69.0 (1753)	86.25 (2190)	86.25 (2190)	84.5 (2146)
J	61.0 (1549)	61.0 (1549)	61.0 (1549)	66.0 (1676)
K	21.3 (541)	21.5 (546)	22.0 (559)	26.8 (681)
K_1	24.5 (622)	24.5 (622)	30.5 (775)	30.0 (762)
L	12.75 (324)	12.75 (324)	12.75 (324)	12.75 (324)
M	25.5 (648)	25.5 (648)	25.5 (648)	25.5 (648)
N	31.5 (800)	31.5 (800)	31.5 (800)	31.0 (787)
P	45.75 (1162)	45.75 (1162)	47.54 (1208)	50.88 (1292)
R	15.0 (381)	15.0 (381)	15.0 (381)	13.0 (330)
S	35.0 (889)	43.0 (1092)	43.0 (1092)	39.5 (1003)
T	5.28 (134)	6.59 (167)	6.59 (167)	9.50 (241)
U	4.0 (101)	1.0 (25)	1.0 (25)	5.0* (127)

INDEX

MEMORANDA

MEMORANDA

MEMORANDA

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.

John Deere Distribution Service Center, Department S/P
1400 3rd Ave., Moline, Ill. 61265

Please send to...

Name _____

Address _____

Town _____

State _____ Zip _____

Title	Order No.	Qty.	Price Each
Parts Catalog			
400 & 500 Series Engines			
(-067684)	PC-1326		$11.25
619A OEM Engines	PC-1563		$ 9.00
6466 DTA OEM Engines			
(067685-)	PC-1721		$11.25
Operator's Manual			
400 & 500 Series Engines	OM-R67604		$ 1.80
Technical Manual			
400 Series Engines	TM-1106		$17.75
500 Series Engines	TM-1107		$17.75

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.

FMO Manual - Tractors	FMO-10102B		$13.80
FMO Manual - Tillage	FMO-111B		13.80
FMO Manual - Planting	FMO-12102B		10.90
FMO Manual - Crop Chemicals	FMO-13102B		12.70
FMO Manual - Hay & Forage Harvesting	FMO-14102B		13.80
FMO Manual - Combine Harvesting	FMO-15102B		10.90
FMO Manual - Preventive Maintenance	FMO-16102B		12.70
FMO Manual - Machinery Management	FMO-17102B		10.90
FMO Manual - Machine Safety	FMO-18102B		12.70
FMO Set of 9 Manuals above	FMO-394 Set		101.00
FOS Manual - Hydraulics	FOS-1003B		8.50
FOS Manual - Electrical Systems	FOS-2004B		9.80
FOS Manual - Engines	FOS-3005B		11.20
FOS Manual - Power Trains	FOS-4004B		8.50
FOUR FOS MANUALS (above)	FOS-90 Set		34.20
FOS Manual - Shop Tools	FOS-5103B		4.25
FOS Manual - Welding	FOS-5204B		6.90
FOS Manual - Belts and Chains	FOS-5303B		4.25
FOS Manual - Bearings and Seals	FOS-5403B		5.60
FOS Manual - Tires and Tracks	FOS-5505B		5.60
FOS Manual - Mowing and Spraying Equipment	FOS-5603B		4.25
FOS Manual - Air Conditioning	FOS-5704B		6.90
FOS Manual - Fuels, Lubricants and Coolants	FOS-5804B		5.60
FOS Manual - Fiber Glass	FOS-5902B		4.25
FOS Manual - Fasteners	FOS-6002B		5.60
FOS Manual - Iden. of Parts Failures	FOS-6102B		6.90
SET OF ELEVEN FOS MANUALS FOS-51B, 52B, 53B, 54B, 55B, 56B, 57B, 58B, 59B, 60B and 61B	FOS-71 Set		54.10
SET OF ALL FIFTEEN FOS MANUALS	FOS-181 Set		88.30
Conservation Farming	FC-10101B		13.80
Machinery Maintenance	FMW-10101B		5.50

Illinois State Residents add 6% for ROT .....

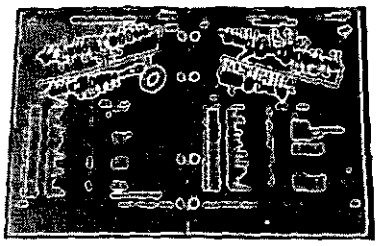
Check or money order in U.S. Dollars enclosed ..... Total
(Do not send cash or stamps)

Prices listed will be effective until 31 December 1984.

SP-319 Litho in U.S.A. APR-84

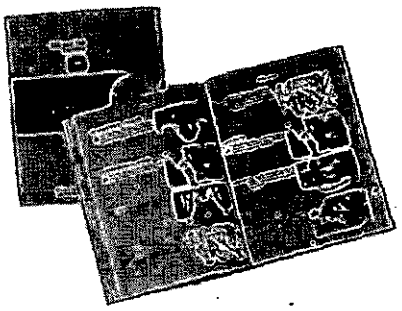
CUT HERE

PARTS CATALOG



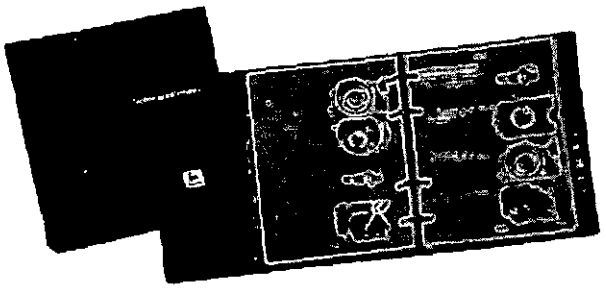
A parts catalog containing exploded view illustrations and lists of all parts is useful when purchasing service parts. Helps identify the correct parts. Useful in assembling and disassembling.

OPERATOR'S MANUAL



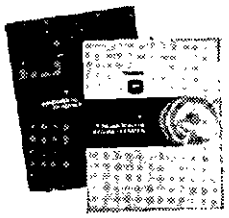
An extra copy of the operator's manual may be important if the copy furnished with your machine is misplaced.

TECHNICAL MANUAL



The technical manual is a service guide for your machine. Included in the manual are specifications, diagnosis and adjustments, illustrations of special assembly and disassembly procedures, hydraulic oil flows, and wiring diagrams.

FMO AND FOS MANUALS



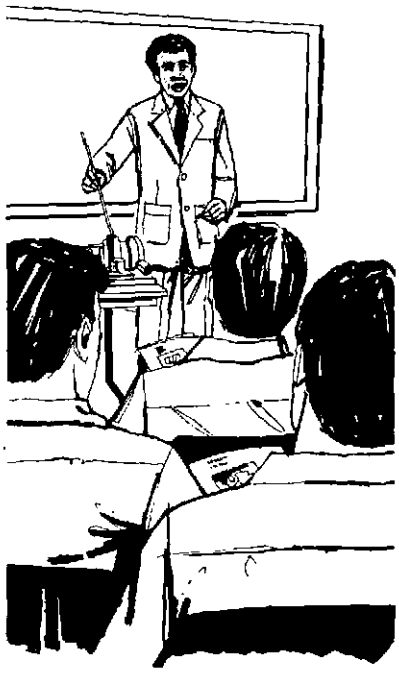
These are basic manuals covering most all types and makes of agricultural machinery. FMO manuals tell you how to *operate* machines; FOS manuals tell you how to *service* machines. Each manual starts with basic theory and is fully illustrated with colorful diagrams and photographs. Both the"whys" and "hows" of adjustments and repairs are covered in this reference library.

Service to keep you on the job

We, at your John Deere dealers, 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