JOHN DEERE 670B AND 672B MOTOR GRADERS

JOHN DEERE

OPERATORS MANUAL

JOHN DEERE 670B AND 672B
MOTOR GRADERS

OMT123951 A9 English

JOHN DEERE DAVENPORT WORKS
OMT123951 A9

LITHO IN THE U.S.A.
ENGLISH

Introduction

Read this manual carefully to learn how to operate and service your machine correctly. Failure to do so could result in personal injury or equipment damage.

This manual should be considered a permanent part of your machine and should remain with the machine when you sell it.

Measurements in this manual are U.S. customary units and their metric equivalents.

Right-hand and left-hand sides are determined by facing in the direction of forward travel.

Write product identification numbers in the Machine Numbers section. Accurately record all the numbers to help in tracing the machine should it be stolen. Your dealer also needs these numbers when you order parts. If this manual is kept on the machine, also file the identification numbers in a secure place off the machine.

Warranty is provided as part of John Deere's support program for customers who operate and maintain their equipment as described in this manual. The warranty is explained on the warranty certificate which you should have received from your dealer.

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. 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.

The tire manufacturer's warranty supplied with your machine may not apply outside the U.S.

All information, illustrations and specifications in this manual are based on the latest product information available at the time of publication. The right is reserved to make changes at any time without notice.

91A;T6175AD3 05T;670B IFC 060189

Contents

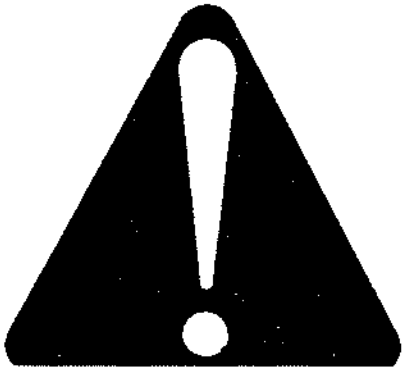
1T4;1 5 100189

Safety

RECOGNIZE SAFETY INFORMATION

This is the safety-alert symbol. When you see this symbol on your machine or in this manual, be alert to the potential for personal injury.

Follow recommended precautions and safe operating practices.



AB6;T81389 053;ALERT 160687

UNDERSTAND SIGNAL WORDS

A signal word—DANGER, WARNING, or CAUTION—is used with the safety-alert symbol. DANGER identifies the most serious hazards.

Safety signs with signal word DANGER or WARNING are typically near specific hazards.

General precautions are listed on CAUTION safety signs. CAUTION also calls attention to safety messages in this manual.

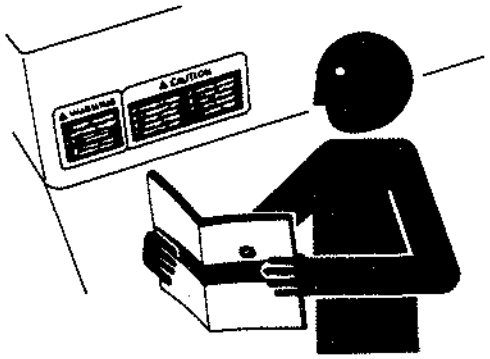
AB6;TS187 053;SIGNAL 071085

FOLLOW SAFETY INSTRUCTIONS

Carefully read all safety messages in this manual and on your machine safety signs. Keep safety signs in good condition. Replace missing or damaged safety signs.

Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.

Keep your machine in proper working condition. Unauthorized modifications to the machine may impair the function and/or safety and affect machine life.



AB6;TS201 053;READ 230487

SERVICE GRADER SAFELY

Never operate the grader if an unsafe condition exists. Attach a "DO NOT OPERATE" tag to the steering wheel.

Be sure you understand the service procedure before working on a machine.

Never lubricate or work on the grader while it is moving.

ALWAYS USE TWO PEOPLE when making checks with the engine running—the operator at the controls, able to see the person doing the checking.

Keep hands away from moving parts.

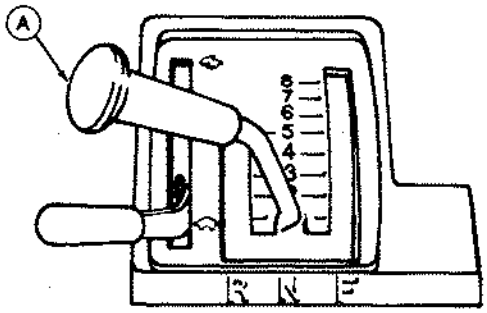
Disconnect battery ground cable before welding on the grader or making adjustments on engine or electrical system.

Turn off the hydraulic front wheel drive system before charging batteries, using booster batteries, or welding on the machine.

Place a support under all raised equipment. If a support is not available, lower equipment to ground.

Before servicing:

1. Move transmission selector lever (A) to neutral.
2. Engage park brake.
3. Lower all equipment to ground.
4. Stop engine and remove key from switch.



018;T6133AH 91A;T6201BO2 T82;05 C11 211086

INSPECT MACHINE

Inspect your machine carefully each day by walking around it before you start it. (See Pre-Start Inspection chapter.)

018;T6607AQ 02T;05 J29. 201087

1T4;0005 02 090189

PREVENT MACHINE RUNAWAY

Avoid possible injury or death from machinery runaway.

Do not start engine by shorting across starter terminals. Machine will start in gear if normal circuitry is bypassed.

NEVER start engine while standing on ground. Start engine only from operator's seat, with transmission in neutral or park.

A86;TS177 053;BYPAS1 210585

USE HANDHOLDS AND STEPS

Falling is one of the major causes of personal injury.

When you get on and off the machine, always maintain a three point contact with the steps and handrails and face the machine. Do not use the steering wheel or any controls as handholds.

Never jump either on or off the machine. Never mount or dismount a moving machine.

Be careful of slippery conditions on platforms, steps, and handrails when leaving the machine.

018;T6669AF 02T;05 J30 180888

KEEP RIDERS OFF MACHINE

Only allow the operator on the machine. Keep riders off.

Riders on machine are subject to injury such as being struck by foreign objects and being thrown off of the machine. Riders also obstruct the operator's view resulting in the machine being operated in an unsafe manner.

A86;TS213 053;RIDER 160687

DRIVE GRADER SAFELY

Clear all persons from area of operation and machine movement.

Drive carefully in congested areas, over rough ground, near ditches for excavations, and on slopes or curves.

Before you travel:

1. Locate blade inside wheels on traffic side of road, and within total width of machine, if possible.
2. Angle blade away from oncoming traffic.

Keep grader in gear when going down hills. Do not coast.

When you travel, be sure path ahead is clear. Use accessory lights and devices to warn operators of other vehicles.

Reduce speed before turning.

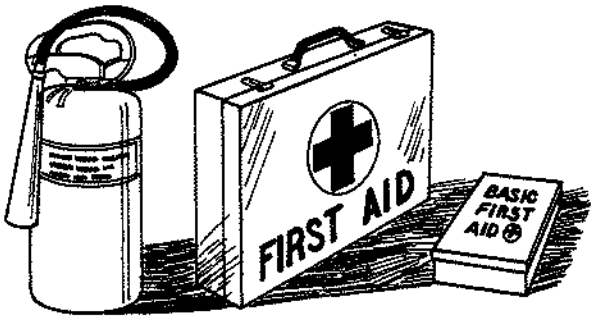
T82;05 C10 030186

PREPARE FOR EMERGENCIES

Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.



AB6;TS186 053;FIRE2 080785

HANDLE FUEL SAFELY—AVOID FIRES

Handle fuel with care: it is highly flammable. Do not refuel the machine while smoking or when near open flame or sparks.

Always stop engine before refueling machine. Fill fuel tank outdoors.

Prevent fires by keeping machine clean of accumulated trash, grease, and debris. Always clean up spilled fuel.

AB6;TS202 053;FIRE1 230487

1T4;0005 04 090189

HANDLE STARTING FLUID SAFELY

Starting fluid is highly flammable.

Keep all sparks and flame away when using it. Keep starting fluid away from batteries and cables.

To prevent accidental discharge when storing the pressurized can, keep the cap on the container, and store in a cool, protected location.

Do not incinerate or puncture a starting fluid container.

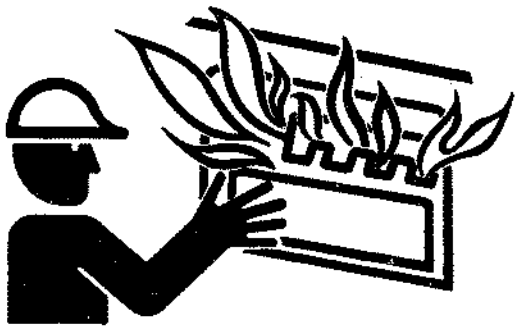
AB6;T6089A U 053;FIRE3 010288

CLEAN TRASH FROM MACHINE

Keep engine compartment, radiator, batteries, hydraulic lines, fuel tank, and operator's station clean.

Temperature in engine compartment may go up immediately after engine is stopped. BE ON GUARD FOR FIRES DURING THIS PERIOD.

Open access door(s) to cool the engine faster, and clean engine compartment.



018;T6669AG 02T;05 J33. 171187

BEWARE OF EXHAUST FUMES

Prevent asphyxiation. Engine exhaust fumes can cause sickness or death.

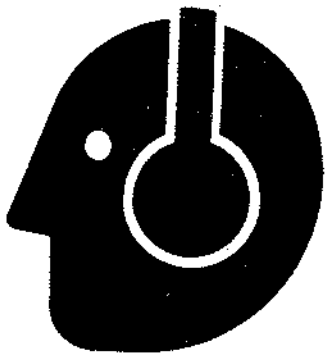
If you must operate in a building, be positive there is adequate ventilation. Either use an exhaust pipe extension to remove the exhaust fumes or open doors and windows to bring enough outside air into the area.

018;T6458AO 02T;05 J9 151286

PROTECT AGAINST NOISE

Prolonged exposure to loud noise can cause impairment or loss of hearing.

Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.

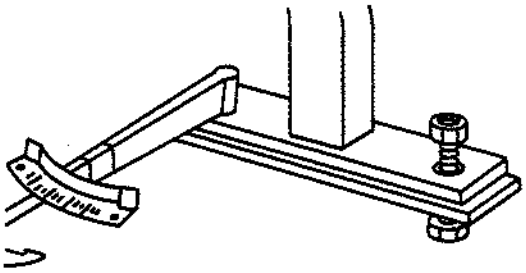


AB6;TS207 053;NOISE 230487

KEEP ROPS INSTALLED PROPERLY

Make certain all parts are reinstalled correctly if the roll-over protective structure (ROPS) is loosened or removed for any reason. Tighten mounting bolts to proper torque.

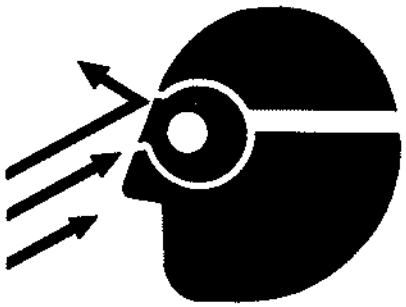
The protection offered by ROPS will be impaired if ROPS is subjected to structural damage, is involved in an overturn incident, or is in any way altered by welding, bending, drilling, or cutting. A damaged ROPS should be replaced, not reused.



A86;TS212 053;ROPS3 230487

PROTECT AGAINST FLYING DEBRIS

When you drive connecting pins in or out, guard against injury from flying pieces of metal or debris; wear goggles or safety glasses.

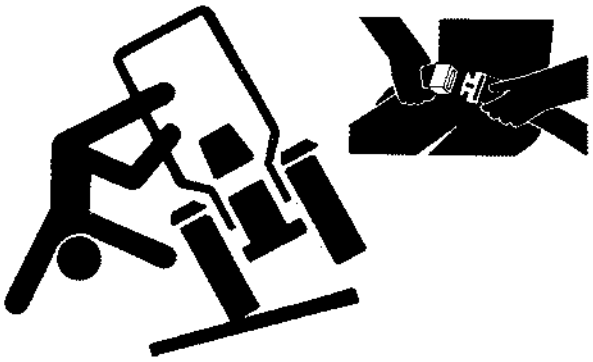


018;T6642DK 02T;05 J25 061087

USE SEAT BELT PROPERLY

Use a seat belt when you operate with a roll-over protective structure (ROPS) to minimize chance of injury from an accident such as an overturn.

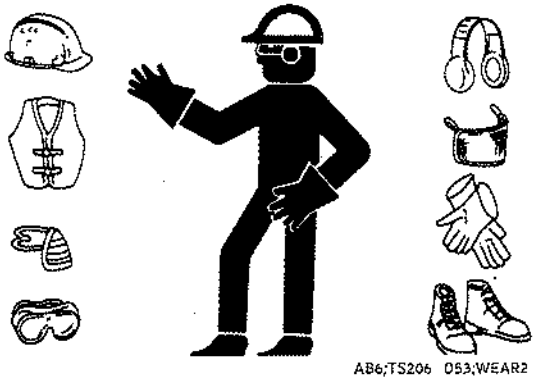
Do not use a seat belt if operating without a ROPS.



A86;TS205 053;ROPS1 230487

WEAR PROTECTIVE CLOTHING

Wear close fitting clothing and safety equipment appropriate to the job.

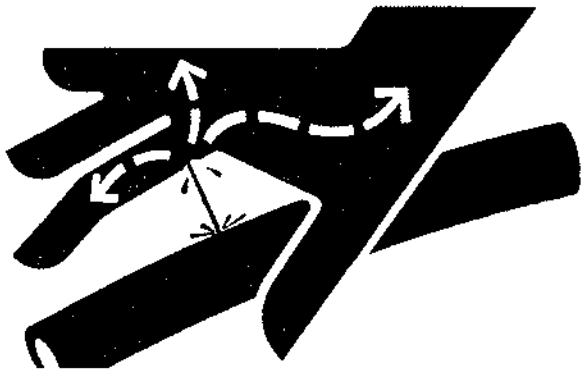


A86;TS206 053;WEAR2 230487

AVOID HIGH-PRESSURE FLUIDS

Escaping fluid under pressure can penetrate the skin causing serious injury. Relieve pressure before unhooking hydraulic or other lines. Tighten all connections before applying pressure. Keep hands and body away from pinholes and nozzles which eject fluids under high pressure. Use a piece of cardboard to search for leaks.

If ANY fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type injury or gangrene may result.



AB6;X9811 053;FLUID 180987

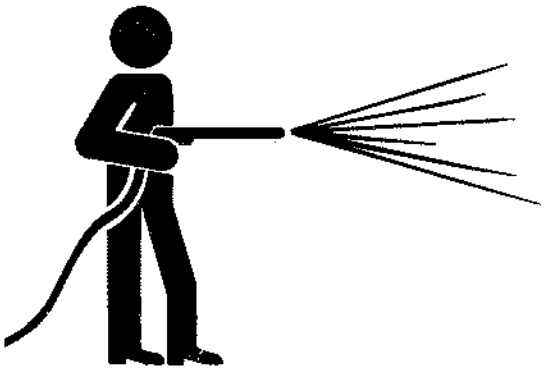
SERVICE COOLING SYSTEM SAFELY

CAUTION: Wait for engine to cool before releasing pressure in radiator cap. Loosen cap slowly to the stop.

018;T6642EK 02T;05 K45 080688

CLEAN THE MACHINE REGULARLY

Remove any grease, oil or debris build-up to avoid possible injury or machine damage.



018;T6642EJ T82;FLSA AC 050188

PRACTICE SAFE MAINTENANCE

Understand service procedure before doing work. Keep area clean and dry.

Never lubricate or service machine while it is moving. Keep hands, feet, and clothing from power-driven parts. Disengage all power and operate controls to relieve pressure. Lower equipment to the ground. Stop the engine. Remove the key. Allow machine to cool.

Securely support any machine elements that must be raised for service work.

Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts. Remove any buildup of grease, oil, or debris.

Disconnect battery ground cable (-) before making adjustments on electrical systems or welding on machine.

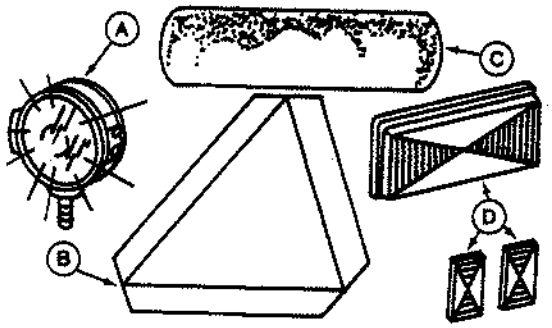
AB6;TS218 053;SERV 211287

USE SAFETY LIGHTS AND DEVICES

When transporting your machine on a road or highway at night or during the day, use necessary safety lights. Check local governmental regulations. A safety lighting kit is available from your John Deere dealer.

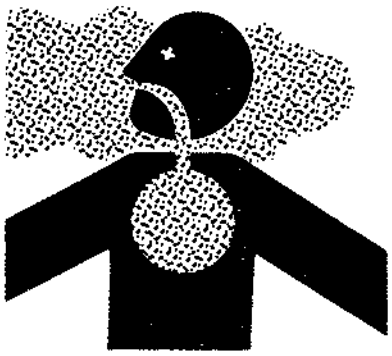
Keep safety items in good condition. Replace missing or damaged items.

A—Lights
B—Slow Moving Vehicle Emblem
C—Reflector Tape
D—Reflectors



AB6;M36564 053;WARN 070188

AVOID HARMFUL ASBESTOS DUST



Avoid breathing dust that may be generated when handling components containing asbestos fibers. Inhaled asbestos fibers may cause lung cancer.

Components in John Deere products that may contain asbestos fibers are brake pads, brake band and lining assemblies, clutch plates, and some gaskets. The asbestos used in these components is usually found in a resin or sealed in some way. Normal handling is not hazardous as long as airborne dust containing asbestos is not generated.

Avoid creating dust. Never use compressed air for cleaning. Avoid brushing or grinding of asbestos containing materials. When servicing, wear an approved respirator. A special vacuum cleaner is recommended to clean asbestos. If not available, wet the asbestos containing materials with a mist of oil or water.

Keep bystanders away from the area.

AB6;TS220 053;DUST 140488

STORE ATTACHMENTS SAFELY

Stored attachments such as dual wheels, cage wheels, and loaders can fall and cause serious injury or death.

Securely store attachments and implements to prevent falling. Keep playing children and bystanders away from storage area.

AB6;TS219 053;STORE 120487

Safety Signs

CAUTION
This filter must not be pressurized over 30 psi as glass may shatter.
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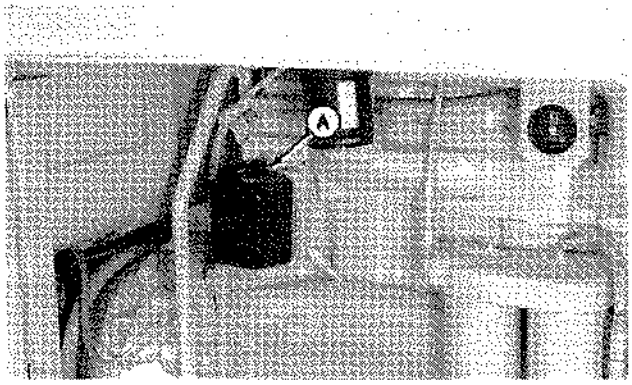
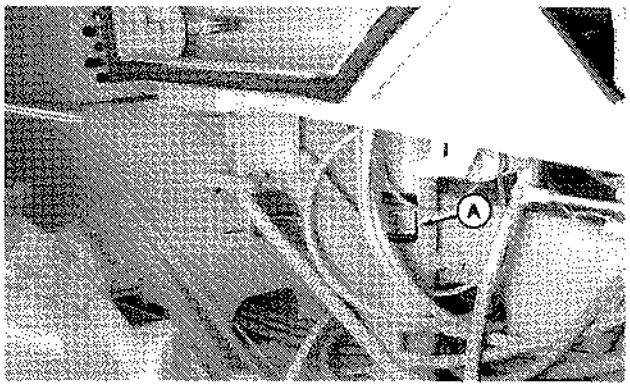


018;T6283BG1 T6913AJ 02T;06 M47 221288

1T4;0006 01 100189



WARNING

Avoid injury from escaping fluid. Contents of this accumulator are under pressure.

1. Refer to proper Machine Model Technical Manual for disassembly or charging instructions and equipment required.
2. Charge with DRY NITROGEN only.

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Maximum Working Pressure 22060 kPA (3200 PSI)

T81378

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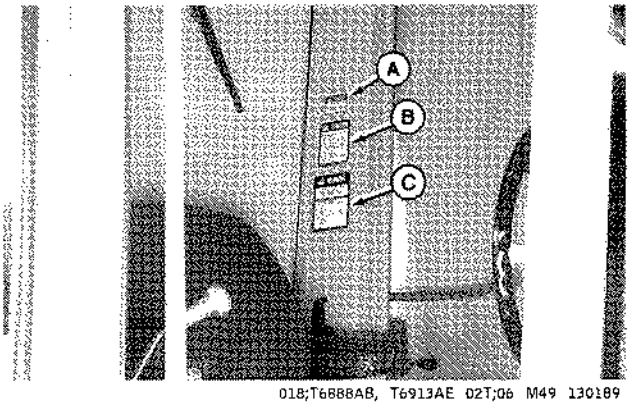
018;T6084AY1, T6913AI 02T;06 M48 110189

CAUTION

Use of seat belt with this roll-over protective structure is recommended under almost all operating conditions

T43705 S



018;T6888AB, T6913AE 02T;06 M49 130189

WARNING

To maintain unimpaired operator protection and manufacturer's ROPS certification:
- — Damaged ROPS structures must be replaced, not repaired or revised.
- — Any alteration to the ROPS must be approved by the manufacturer.

ROLL-OVER PROTECTIVE STRUCTURE CERTIFICATION

Performance certified at date of manufacture to:
OSHA: 1926.1001
SAE: J1040c
ISO: 3471-1980
Maximum Machine Weight: 40 862 lbs (18 535 kg)

John Deere Grader Models:
6708, 672B,
770B, 772B,
770BH, 772BH

Deere & Company
Moline, Illinois

T103575 S

WARNING

To maintain unimpaired operator protection and manufacturer's ROPS certification.
- — Damaged ROPS structures must be replaced, not repaired or revised
- — Any alteration to the ROPS must be approved by the manufacturer.

ROLL-OVER PROTECTIVE STRUCTURE CERTIFICATION

Performance certified at date of manufacture to
OSHA: 1926.1001
SAE: J1040c
ISO: 3471-1980
Maximum Machine Weight 46 210 lbs (20 690 kg)
SAE: J396a
Maximum Machine Weight 43 770 lbs (19 855 kg)
John Deere Grader Models
670B, 672B,
770B, 772B,
770BH, 772BH
Deere & Company
Moline, Illinois

T107273 S

018;T6921AQ, T6921AJ 02T;06 M50 110189

DANGER

EXPLOSIVE GASES

Cigarettes, flames or sparks could cause battery to explode. Always shield eyes and face from battery. Do not charge or use booster cables or adjust post connections without proper instruction and training. Keep vent caps tight and level.

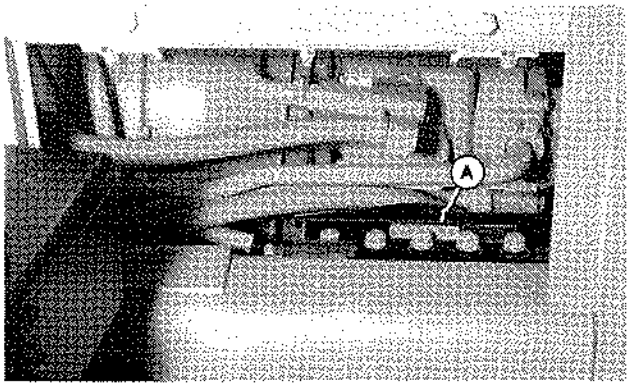
T124343

POISON

CAUSES SEVERE BURNS

Contains sulfuric acid. Avoid contact with skin, eyes or clothing. In event of accident, flush with water and call a physician immediately.
Keep out of reach of children.

A—



018;T6888AC, T6913AK 02T;06 M51 110289

⚠ WARNING

AVOID POSSIBLE INJURY OR DEATH FROM A MACHINE RUNAWAY.

1. Do not start engine by shorting across starter terminals. Machine will start in gear and move if normal starting circuitry is bypassed.
2. Start engine only from operator's seat with transmission in neutral or park. NEVER start engine while standing on ground.

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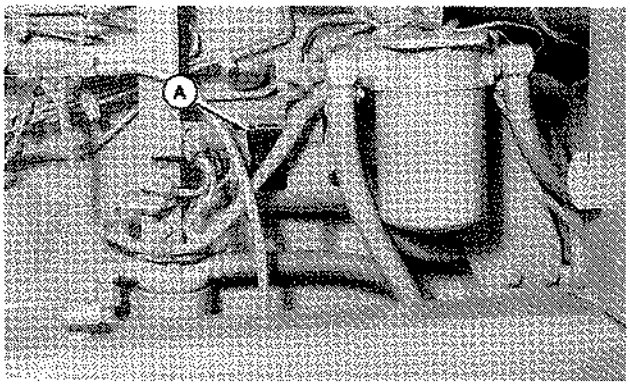
T75512



018;T6891AD, T6913AL 02T;06 M52 110189

⚠ WARNING

Do not unlock locking pin unless blade is on ground.

T83016

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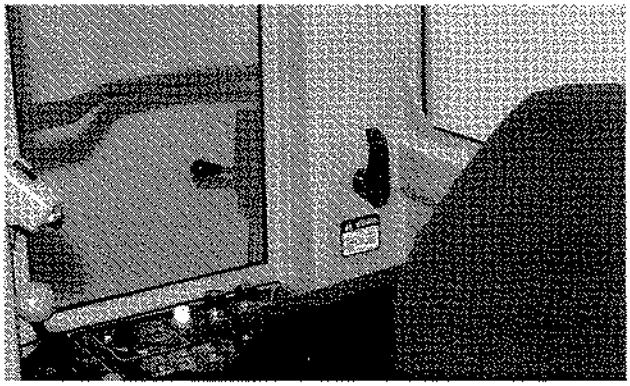
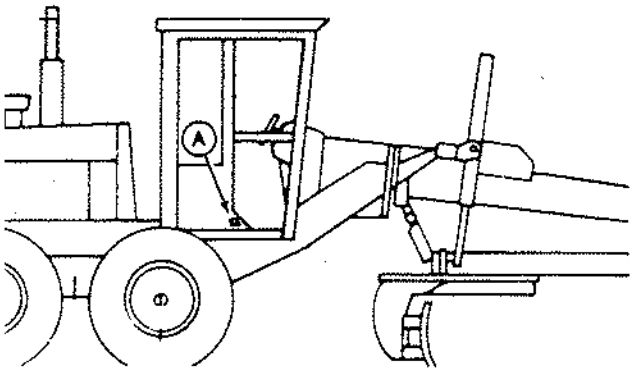


018;T6921AM T6913AF 02T;06 M53 110189

WARNING

Do not stand on steps when operating or turning machine.

T35616 (S)



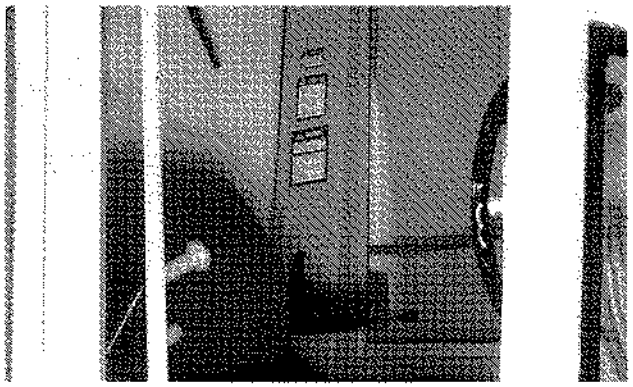
A—Both Sides

018;T6921AL, T6921AT 02T;60 M54 110189

CAUTION

1. Operate machine only from operator's seat.
2. Before leaving operator's seat:
   - Lower equipment to ground.
   - Place transmission selector in neutral (N) position.
   - Set parking brake.
   - Turn off engine.
3. Read Operator's Manual for safe machine operation.

(T107016)



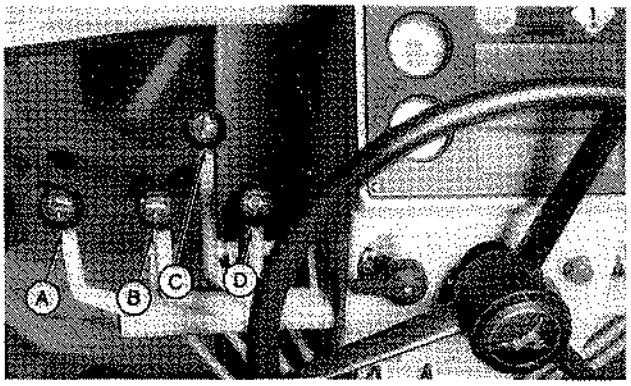
018;T6921AK, T6913AE2 02T;06 M55 110189

Operator's Station

CONTROL LEVERS—TWO HAND BLADE LIFT

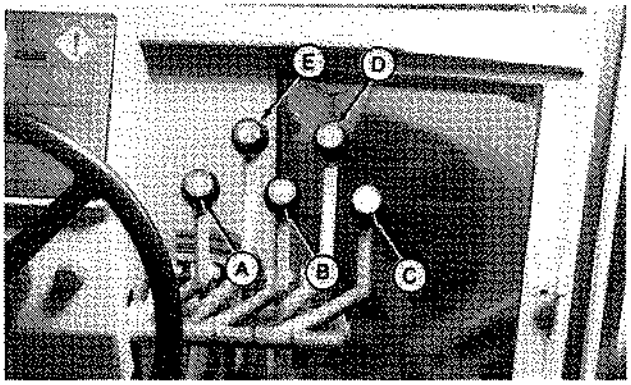
NOTE: All instructions in the Operator's Manual apply to machines with two hand blade lift control levers unless specified otherwise.

A—Blade Lift—Left Side
B—Blade Side Shift
C—Blade Pitch
D—Circle Rotation



91A;T6180AG1 02T;10 M187. 171188

A—Circle Side Shift
B—Wheel Lean
C—Blade Lift—Right Side
D—Attachment
E—Rear Steer

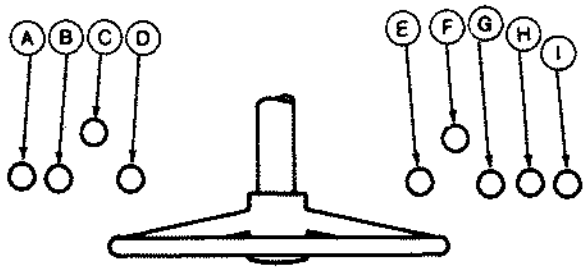


91A;T6264AA1 T82;10 C2 080186

CONTROL LEVERS—ONE-HAND BLADE LIFT

NOTE: All instructions in the Operator's Manual apply to machines with two-hand blade lift control levers unless specified otherwise.

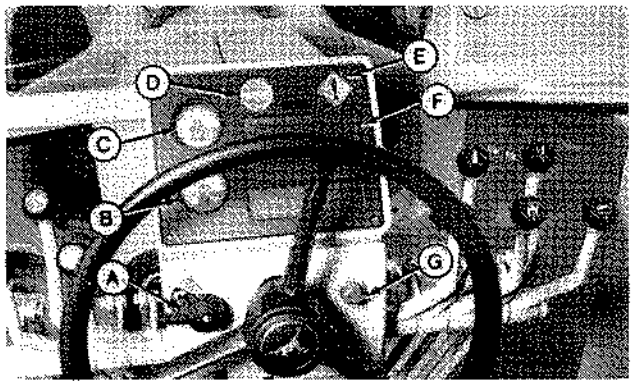
A—Scarifier
B—Blade Side Shift
C—Blade Pitch
D—Circle Rotation
E—Circle Side Shift
F—Rear Steer
G—Wheel Lean
H—Blade Lift Left
I—Blade Lift Right



91A;T6222BB 02T;10 M188. 171188

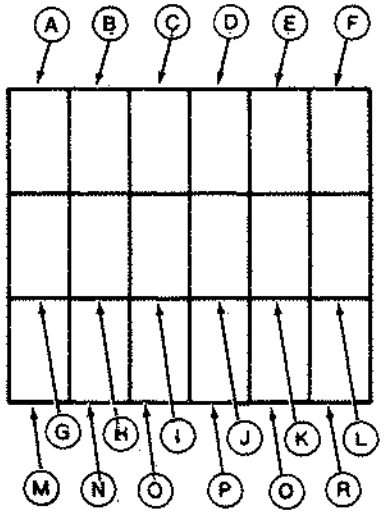
FRONT CONSOLE

A—Turn Signal Switch
B—Fuel Gauge
C—Rear Steer Indicator
D—Stop Engine Indicator
E—Service Required Indicator
F—Monitor Panel
G—Horn



91A;T6180AH2 02T;10 M189. 171188

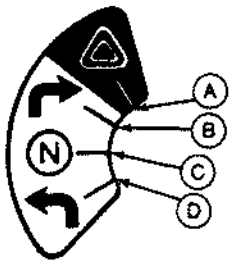
MONITOR PANEL INDICATOR LIGHTS



A—Engine Coolant Temperature Indicator
B—Engine Oil Pressure Indicator
C—Engine Alternator Voltage Indicator
D—Engine Air Filter Indicator
E—Brake Pressure Indicator
F—Spare
G—Transmission Oil Temperature Indicator
H—Transmission Oil Pressure Indicator
I—Transmission Oil Filter Indicator
J—Hydraulic Oil Filter Indicator
K—Hydraulic Front Wheel Drive Charge Pressure Indicator—If Equipped
L—Hydraulic Front Wheel Drive Oil Filter Indicator—If Equipped
M—Left Turn Signal Indicator
N—Spare
O—Saddle Lock Indicator
P—Park Brake Indicator
Q—Differential Lock Indicator
R—Right Turn Signal Indicator

91A;T6218AU 02T;10 M190. 100189

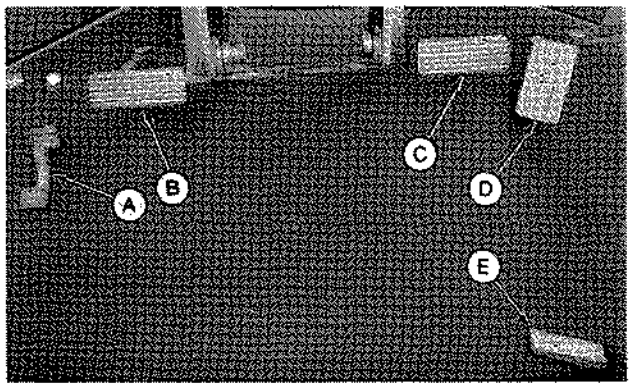
TURN SIGNAL SWITCH



A—Warning Lights
B—Right Turn
C—Neutral (Off Position)
D—Left Turn

91A;T6188AU 02T;10 M191. 171188

PEDALS

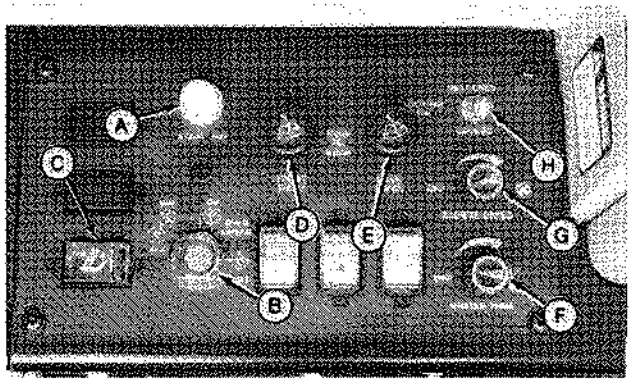


A—Differential Lock
B—Inching (Clutch) Pedal
C—Brake
D—Accelerator
E—Decelerator

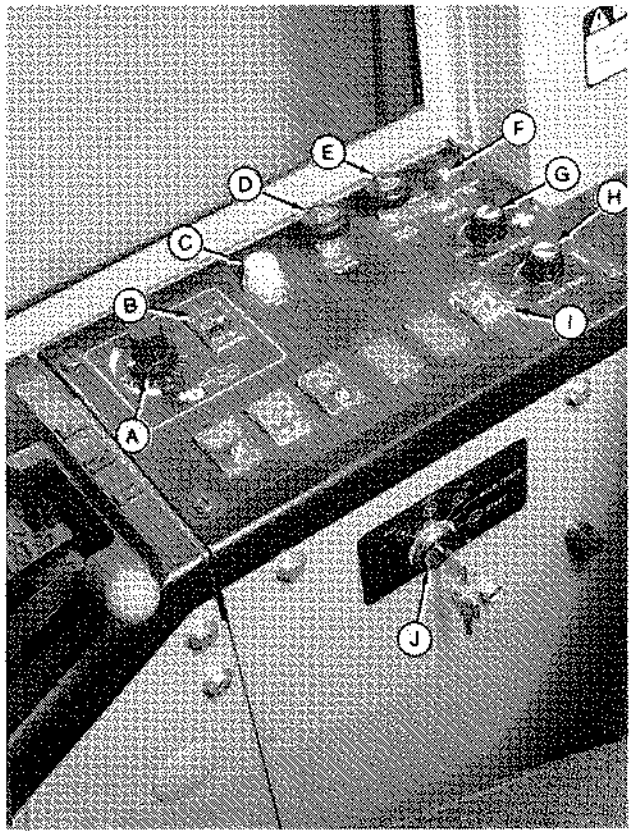
91A;T6180AI 02T;10 M192. 171188

SWITCHES

A—Start Aid—If Equipped
B—Key
C—Ripper—If Equipped
D—Front Windshield Wiper/ Washer—If Equipped
E—Rear Windshield Wiper/ Washer—If Equipped
F—Heater Temperature—If Equipped
G—Blower Speed—If Equipped
H—Locking Pin



Earlier Units

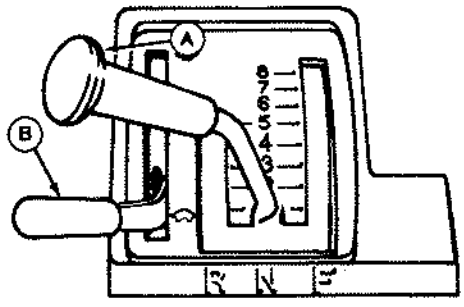


A—Hydraulic Front Wheel Drive Aggressive Switch
B—Hydraulic Front Wheel Drive ON/OFF Switch
C—Start Aid Switch—If Equipped
D—Front Windshield Wiper/ Washer Switch—If Equipped
E—Rear Windshield Wiper/ Washer Switch—If Equipped
F—Locking Pin Switch
G—Blower Speed Switch—If Equipped
H—Heater Temperature Switch
I—Repair Switch—If Equipped
J—Key Switch

Later Units

91A;T6175AG2, T6913AH1 02T;10 K141 120189

LEVERS



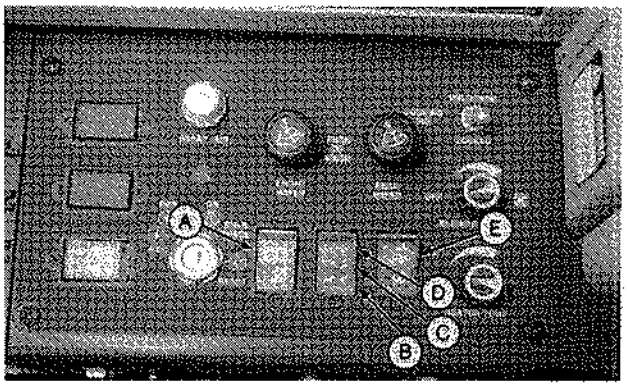
A—Transmission Selector Lever
B—Engine Speed Control Lever

91A;T6201BO 02T;10 M194. 171188

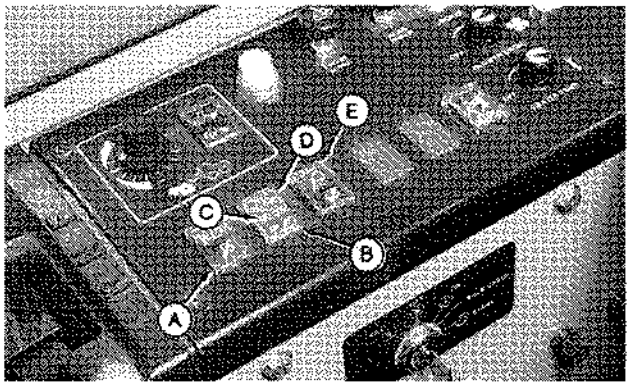
1T4;0010 03 090189

LIGHT SWITCHES

A—Driving Lights and Tail Lights On
B—Work Lights Off
C—Front Work Lights On
D—Front and Rear Work Lights On
E—Work Lights (Under Cab) On



Earlier Units

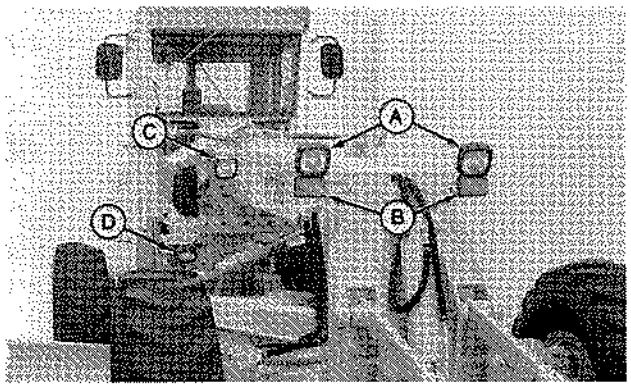


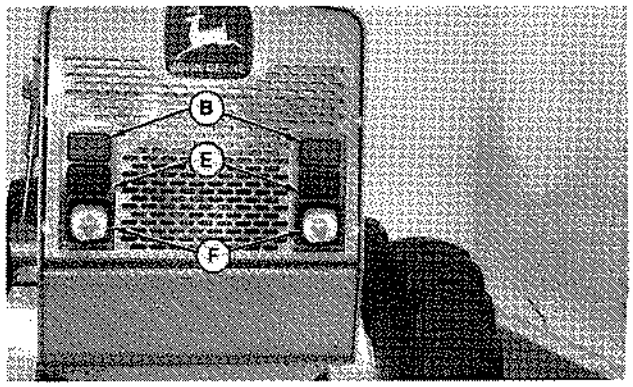
Later Units

91A;T6175AF, T6913AH2 02T;10 K142. 060189

LIGHTS

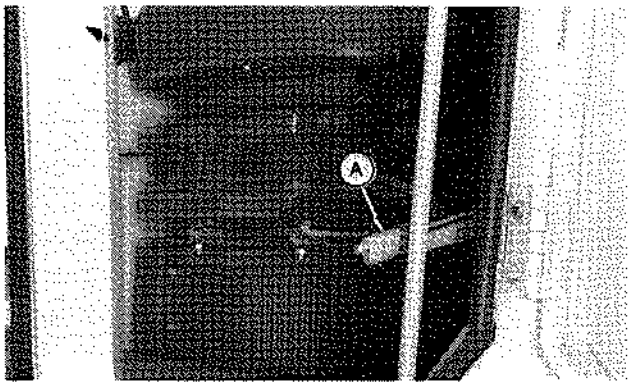
A—Driving Lights
B—Turn Signals—If Equipped
C—Front Work Lights (Right Side Shown)—If Equipped
D—Work Lights (Under Cab) (Right Side Shown)—If Equipped
E—Tail Lights and Brake Lights
F—Rear Work Lights—If Equipped





91A;T6175AE, T6164BG T82;10 C13 060189

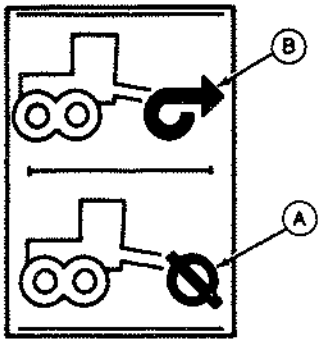
PARK BRAKE LEVER (A)



91A;T6186AA2 T82;10 C14 111285

HYDRAULIC FRONT WHEEL DRIVE CONTROLS (Serial No. -520351)

Control switches are located on control box to left of operator's seat.

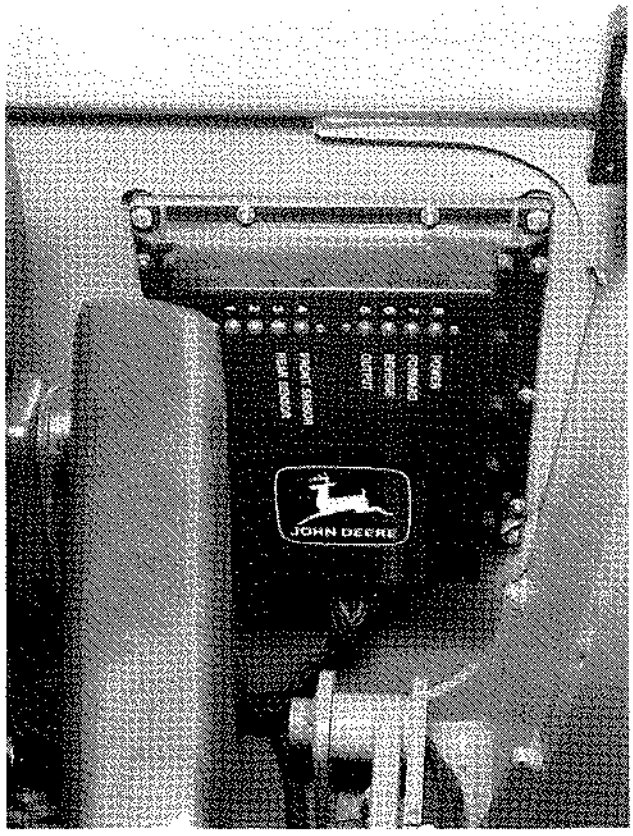


A—HFWD Disengaged **B—HFWD Engaged**

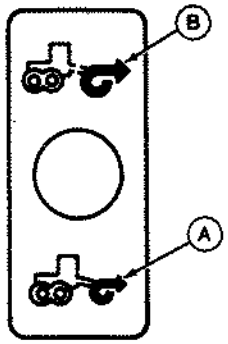
91A;T6221AE 02T;10 M198. 091288

HYDRAULIC FRONT WHEEL DRIVE DIAGNOSTIC CONTROL BOX (Serial No. 520352—)

Located behind operator's seat in cab.



91A;T6913AG 02T;10 M199. 171188



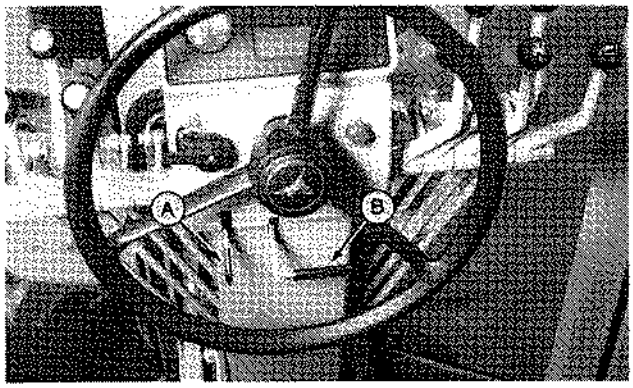
A—Normal Mode B—Aggressive Mode

91A;T6221AF T82;10 C26 111285

ADJUSTING FRONT CONSOLE

Raise lever (A) to tilt steering wheel up or down. Release lever to lock.

Raise lever (B) to move pedestal forward or backward. Release lever to lock.



91A;T6180AH1 02T;10 M200 171188

ADJUST SEAT

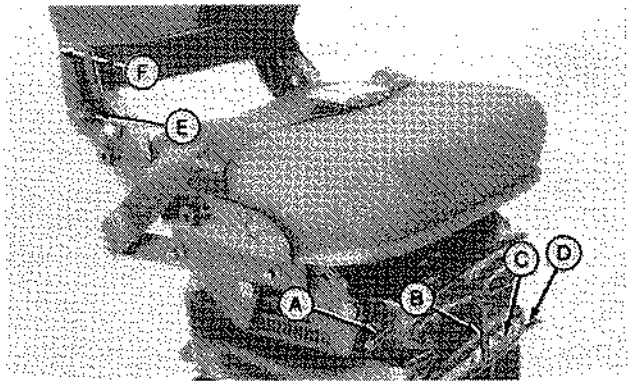
Push vertical adjustment lever (A) down to move seat to desired height. Release lever to lock.

Turn weight adjustment lever (B) clockwise for firm ride; counterclockwise for soft ride. Weight adjustment is set by turning lever (B) until yellow pointer inside tube (C) is flush with tube opening.

Pull lever (D) to side to move seat forward or backward. Release lever and slide seat to lock in place.

Raise or lower knob (E) to adjust tilt of seat back.

Raise or lower knob (F) to adjust tension of seat back.

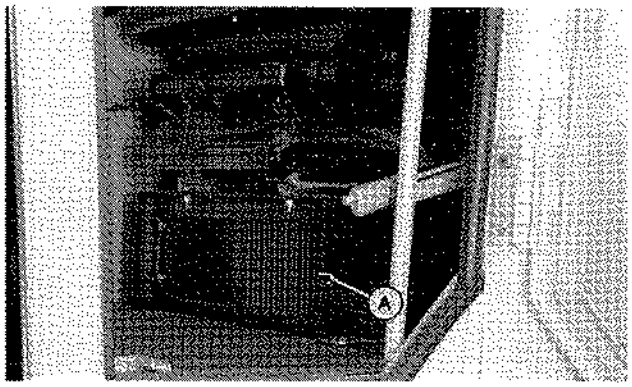


91A;T6190AQ 02T;10 M201. 100189

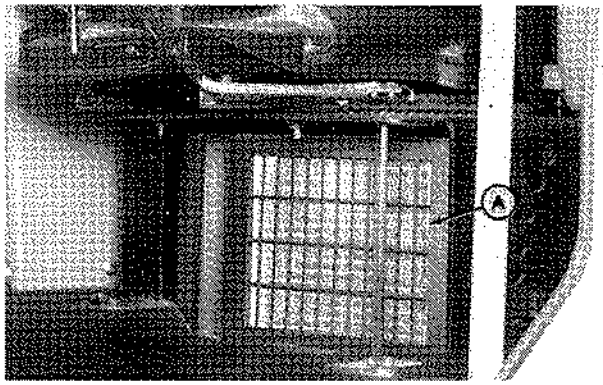
HEATER (A)—IF EQUIPPED (20,000 BTU/HR)

Turn blower speed knob (B) clockwise to increase blower speed.

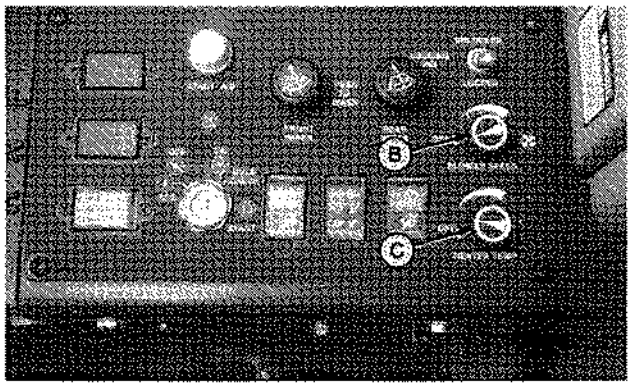
Turn heater temperature knob (C) clockwise to increase temperature.



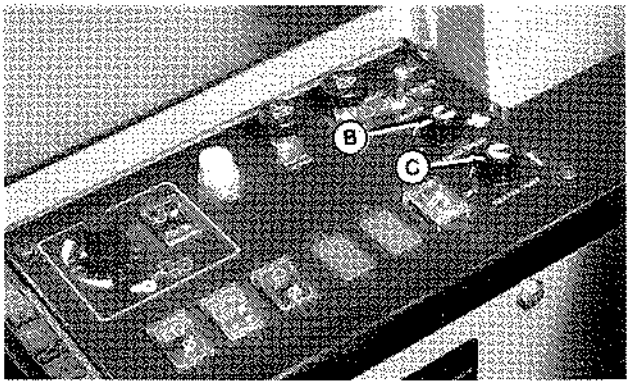
Earlier Units



Later Units



Earlier Units



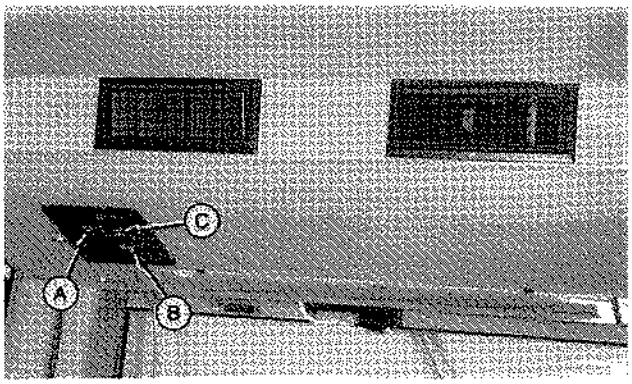
Later Units

AIR CONDITIONER—HEATER—IF EQUIPPED

Turn heater temperature knob (A) clockwise to increase temperature.

Turn blower speed knob (B) clockwise to increase blower speed.

Turn cooling control knob (C) clockwise to increase cooling.



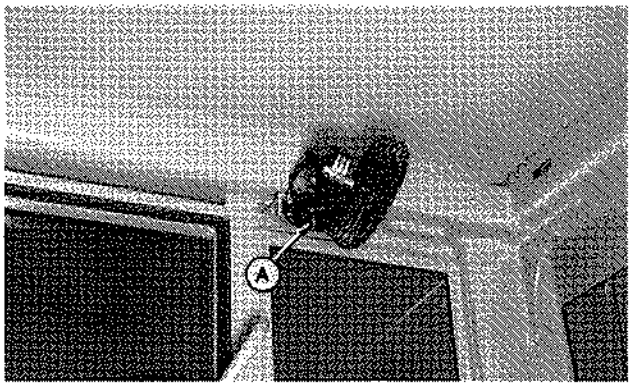
91A;T61B1AS 02T;10 M203. 101188

DEFROSTER FAN

Move switch (A) to right for low speed.

Move switch to left for high speed.

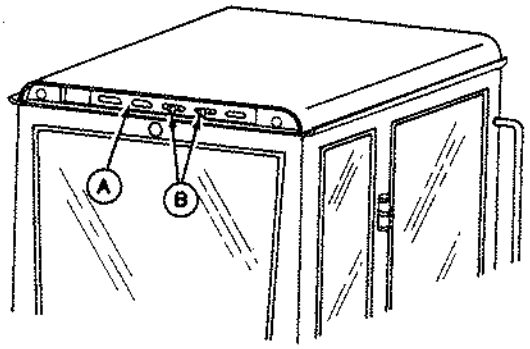
Keep switch in center for OFF position.



91A;T6913AQ 02T;10 M204. 181188

If condensation (moisture) builds up on inside of cab windows, remove air conditioner filter on outside back of cab.

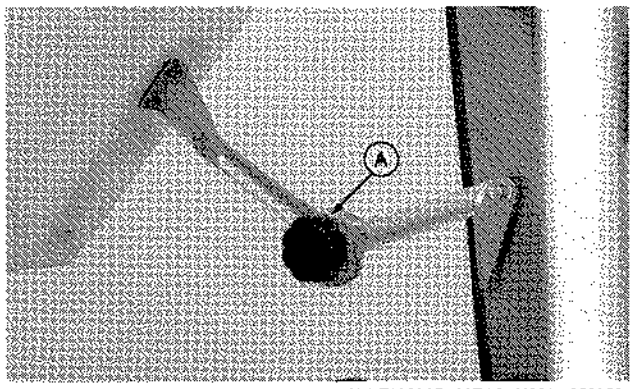
Loosen cap screws (B) and move panel (A) to the left. This will close off outside humid air coming in to the cab.



91A;T6942BA 02T;10 M205. 181188

OPENING WINDSHIELD

Loosen knob (A). Lift knob and push forward to open window. Tighten knob.

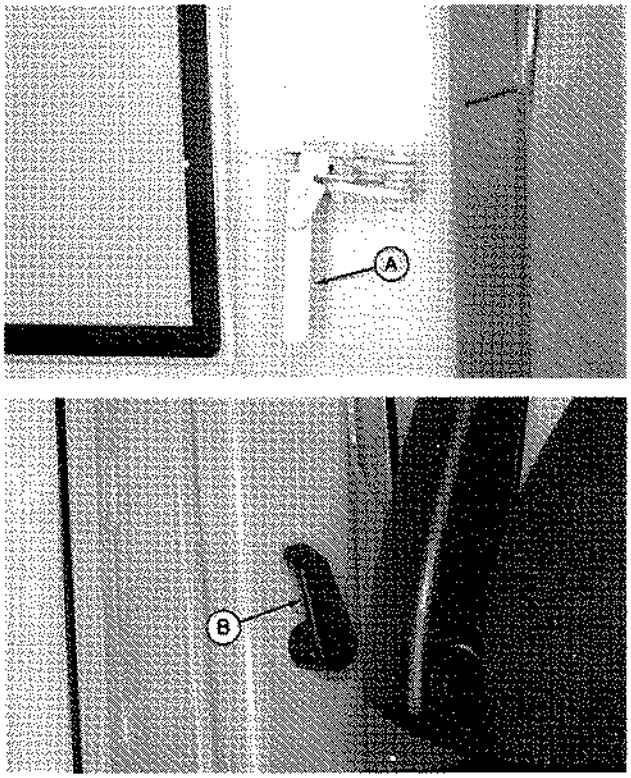


91A;T6186AP 02T;10 M206. 181188

CAB DOOR RELEASE

From outside of grader, pull lever (A) toward rear of machine to release door.

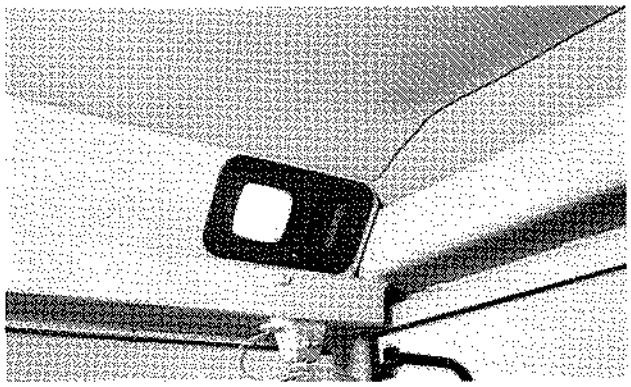
From inside cab, push lever (B) down to release door.



91A;T6186AQ,T6186AS T82;10 C22 111285

CAB LIGHT

The ON-OFF switch is next to the light.



91A;T6181AR1 027;10 M208. 181188

Break-In

OBSERVE ENGINE OPERATION CLOSELY

IMPORTANT: Become thoroughly familiar with the sound and feel of your new machine.

NOTE: If air temperatures are above 50°F (10°C), engine oil should be replaced with seasonal viscosity oil earlier than 100 hours. Also replace engine oil filter(s).

1. Operate engine at normal loads. (See Specifications chapter.)

2. Avoid excess engine idling.

3. Check indicator lights and gauges frequently during operation.

02T;15 M27. 181188

AFTER THE FIRST TEN HOURS

1. Perform 10 hour or daily service. (See Periodic Maintenance--Every 10 Hours or Daily.)

2. Watch for fluid leaks.

3. Lubricate working tool pivots every 10 hours for first 100 hours and when working in mud and water.

4. Tighten wheel retainer cap screws.

SPECIFICATIONS

Wheel cap screws	300 lb-ft (407 N·m)
Front wheel cap screws (Front wheel drive units only)	130 lb-ft (177 N·m)

02T;15 M28. 191288

AFTER THE FIRST 50 HOURS

1. Perform 50 hour service. (See Periodic Maintenance--Every 50 Hours.)

2. Tighten accessible hardware. (See Hardware Torque Specifications in Maintenance chapter.)

SPECIFICATIONS

Rear circle support nuts	445 lb-ft (603 N·m)
Front circle support nuts	670 lb-ft (908 N·m)
Lower blade retainer cap screws	300 lb-ft (407 N·m)
Upper blade retainer cap screws	445 lb-ft (603 N·m)

3. Change hydraulic and transmission oil filters. (See Periodic Maintenance—Every 500 Hours and Every 1000 Hours chapters.)

021;15 M29. :91288

AFTER THE FIRST 100 HOURS

1. Perform 50 hours and 100 hours service. (See Periodic Maintenance—Every 50 Hours and Every 100 Hours chapters.)

2. Change engine oil and filter. (See Periodic Maintenance—Every 250 Hours chapter.)

02T;15 M14 181188

Pre-Start Inspection

INSPECT GRADER DAILY BEFORE STARTING

A—Check front and rear tire pressure. Inspect for wear, cuts, and damage.

B—Check for loose or missing wheel bolts.

C—Check air cleaner restriction indictor.

D—Clean tandem steps.

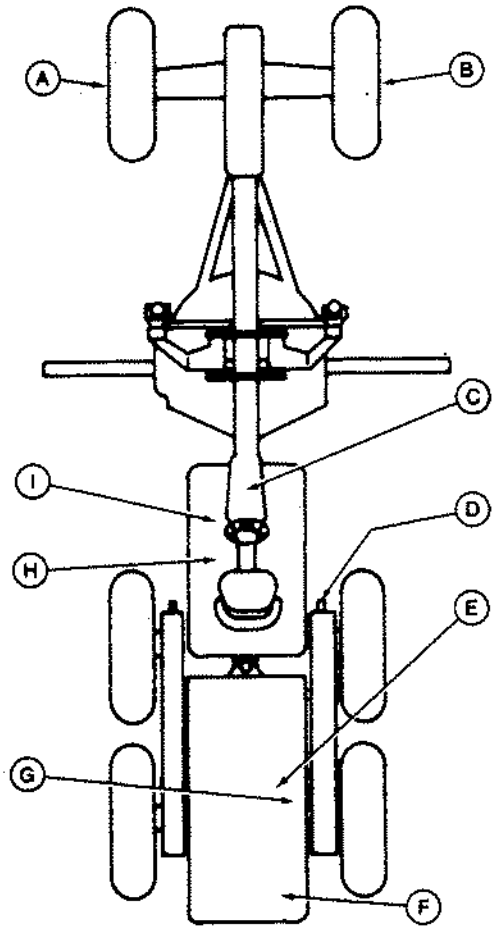
E—Check engine oil level.
Clean radiator area.
Check coolant level.
Check fuel filters.
Check pre-cleaner bowl and air inlet screen.

F—Check batteries.

G—Check transmission hydraulic oil level.

H—Clean operator's station.

I—Check lever and pedal operation.



91A;T6921AI 02T;20 M29 110189

ELECTRICAL SYSTEM: Check for worn or frayed wires and loose connections.

BLADE, SCARIFIER, RIPPER, SHEET METAL: Check for bent, broken, or missing parts.

HARDWARE: Check for loose or missing parts.

SAFETY: Walk around machine to clear all persons from machine area.

HYDRAULIC SYSTEM: Check for leaks, kinked hoses, and lines or hoses that rub against each other or other parts.

LUBRICATION: Check lubrication points on Periodic Maintenance Chart

PROTECTIVE DEVICES: Check guards, canopy, shields, ROPS, seat belt.

02T;20 M30 221288

174;0020 01 090189

CHECK INSTRUMENTS BEFORE STARTING

1. Turn key switch clockwise and hold in BULB CHECK position.

All indicator lights must light.

If any indicator fails to light, the bulb may be burned out.

2. Turn key switch to OFF position.

3. Turn key switch clockwise to BULB CHECK position and release immediately.

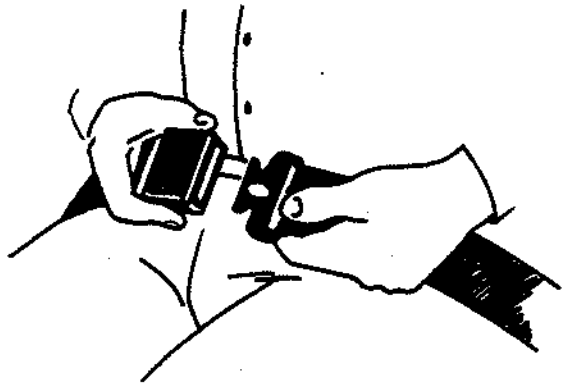
If the function is engaged, park brake, saddle lock, and turn signal indicators will light.

After a delay of 3—5 seconds these indicators must light:
- Engine oil pressure
- Brake pressure
- Alternator voltage
- Transmission oil pressure
- HFWD charge pressure (HFWD units only)

If any of these fail to light, see your John Deere dealer.

02T;25 M131. 121288

STARTING THE ENGINE



CAUTION: Avoid possible injury or death from a runaway machine.

Do not start engine by shorting across starter terminals. Machine will atart in gear if normal starting circuitry is bypassed. NEVER start engine while standing on ground. Start engine only from operator's seat with transmission selector lever in neutral. Engage park brake.

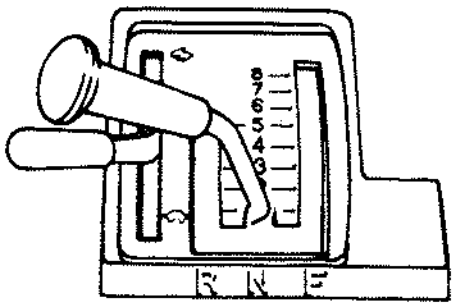
IMPORTANT: Never operate atarter motor for more than 20 seconds at a time. If engine falls to start after two or three triea, return key switch to OFF. Wait for sbout 2 minutes, then try again.

After a false start, do not turn key switch until engine stops or starter may be damaged.

Engine will not start by towing or puahing. Permanent damage to transmission will result.

AB6;TS175 02T;25 M132. 181188

1. Fasten seat belt.
2. Push fuel shut-off knob in.
3. Move transmission selector lever to neutral.
4. Engage park brake.
5. Move speed control lever one-third speed.



91A;T6218BA T82;25 C13 291188

CAUTION: When starting engine, do not depress brake pedal. System pressure will cause pedal to come up rapidly.

6. Sound the horn. Turn key switch to START position. Do not crank engine more than 20 seconds. Wait two minutes before trying again. Release key when engine starts.
7. Run engine at one-third speed for 30 seconds.

T82;25 C14 070186

USING STARTING FLUID—IF EQUIPPED (COLD WEATHER STARTING AID)

CAUTION: Starting fluid is highly flammable.

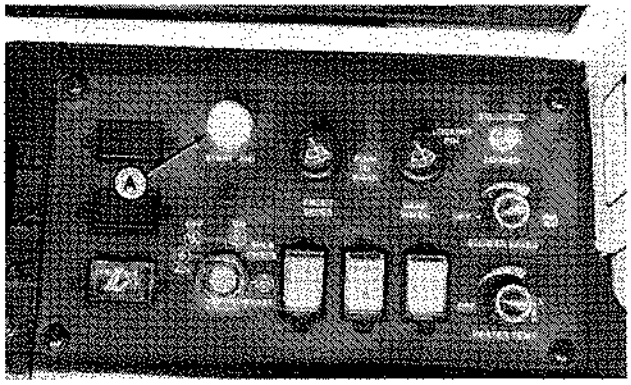
IMPORTANT: Keep starting fluid can in place at all times to protect starting aid components.

Use starting aid when temperatures are below 30°F (—1°C) and only when engine is COLD.

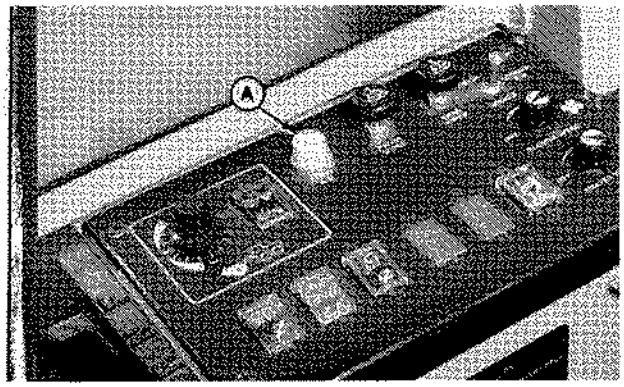
1. Turn key switch clockwise. Push starter button.

2. After one or two revolutions of engine crankshaft, push starting aid button (A) at short intervals. Crank engine for 20 seconds maximum, then allow 2 minutes between cranking periods.

IMPORTANT: Starting fluid is being injected into engine as long as you push button. Push starting aid button ONLY when engine is cold and cranking; excess starting fluid could damage engine.



Earlier Units



Later Units

91A;T6175AG1, T6913AH4 02T:25 K108. 110189

REPLACE STARTING AID CAN

CAUTION: Starting fluid can is highly explosive. Do not set can on battery surface or weld on machine near can. A spark could cause an explosion.

IMPORTANT: When operating without starting aid can, remove lower section of holder (A), turn upside down and reinstall. This must be done to protect atarting aid components.

1. Remove engine side shield.

2. Remove empty starting fluid can by turning lower section of holder (A) counterclockwise until the can is removed.

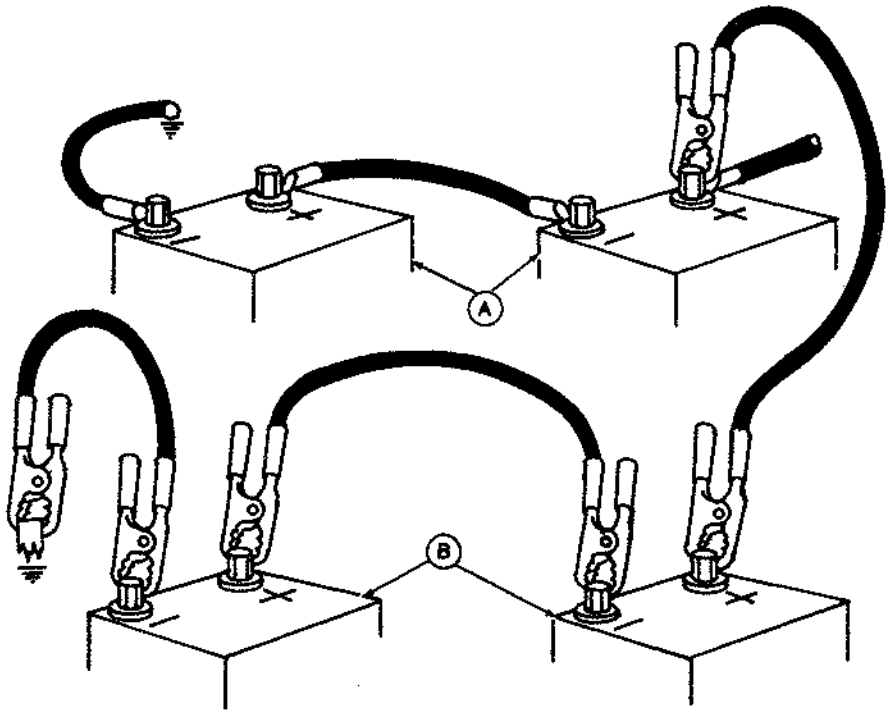
3. Remove safety cap and spray button from new can.

4. Install new can in bracket.

5. Turn holder clockwise to tighten can.

018;T6464AV 02T;25 M134. 100189

USING BOOSTER BATTERIES



A—Machine Batteries (2—12 V)

B—Booster Satteries (2—12 V)

1. Lower all equipment to the ground.
2. Set park brake.
3. Move F-N-R lever to neutral "N".

CAUTION: An explosive gas is produced while batteries are In use or being charged. Keep flames or sparks away from the battery area. Charge batteries In s well-ventilsted area.

IMPORTANT: The machine electrical system is a 24 volt negative (-) ground. Use only 24 volt booster batteries.

Connect booster batteries as shown. Make last connection to frame.

018;T6478AK 02T;25 M65. 191288

USING COOLANT HEATER—IF EQUIPPED (COLD WEATHER STARTING AID)

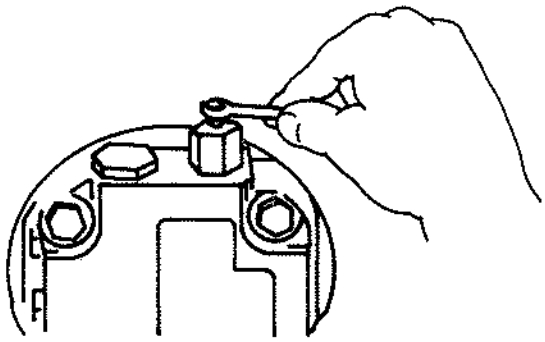
CAUTION: Use a grounded cord to connect the coolant heater to electrical power. DD NOT plug into electrical power unless heating element is immersed in coolant. Sheath could burst and result in personal injury.

Connect the coolant heater to 115-volt electrical power 10 hours before you start the engine.

02T;25 M135. 090189

DESTROKING HYDRAULIC PUMP (COLD WEATHER STARTING AID)

1. Turn destroke screw clockwise until you feel resistance.
2. Turn screw one more turn allowing engine to crank faster.
3. Start the engine.
4. After engine starts, turn screw counterclockwise all the way out.



91A;T6163AA 02T;25 M136. 211188

CHECK INSTRUMENTS AFTER STARTING

IMPORTANT: If indicator lights do not go out after starting engine, IMMEDIATELY STOP THE ENGINE. Find and correct the cause.

Cold oil may cause transmission oil filter, hydraulic oil filter and HFWD oil filter (if equipped) lights to come on.

Turn signal, park brake and differential lock lights will come on if the function is engaged.

02T;25 M137. 211188

STOP ENGINE INDICATOR AND ALARM

IMPORTANT: If stop engine indicator flashes and alarm sounds, stop engine immediately and investigate cause of problem. Do not start engine until problem has been corrected.

The stop engine indicator flashes and alarm sounds when:
- Engine oil pressure is low.
- Engine coolant temperature is excessively high.
- Brake pressure is low.
- Transmission oil temperature is excessively high.
- Transmission is shifted into gear with park brake on.

018;T6201BM 02T;25 M138. 211188

SERVICE REQUIRED INDICATOR

If service required indicator lights, a problem is developing. It is not necessary to stop the engine immediately, but the cause should be investigated as soon as possible.

The service required indicator lights when:
- Engine coolant temperature is high. (Early units only)
- Engine alternator voltage is low.
- Engine air filter is restricted.
- Transmission oil pressure is low.
- Transmission oil temperature is high.
- Transmission oil filter is restricted.
- Hydraulic oil filter is restricted.
- HFWD charge pressure is low.
- HFWD filter is restricted.
- Saddle locking pin is disengaged.

018;T6201BL 02T;25 M139. 211188

ENGINE OIL PRESSURE INDICATOR

Indicator will light when engine oil pressure is low.

018;T6201BB 02T;25 M140. 211188

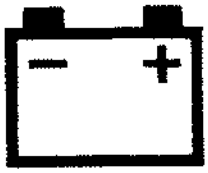
ENGINE COOLANT TEMPERATURE INDICATOR

Indicator will light when engine coolant temperature is high.

018;T6201BC 02T;25 M141. 211188

ALTERNATOR VOLTAGE INDICATOR

Indicator will light with no alternator output.



018;T6201BD 02T;25 M142. 211188

ENGINE AIR FILTER INDICATOR

Indicator will light and service required indicator will flash when air filter elements are restricted. Change filter elements.

018;T6201BE 02T;25 M143. 211188

BRAKE PRESSURE INDICATOR

Indicator will light when brake pressure is low.

018;T6201BF 02T;25 M144. 211188

TRANSMISSION OIL TEMPERATURE INDICATOR

Indicator will light when transmission oil temperature is high.

018;T6201AW 02T;25 M145. 211188

TRANSMISSION OIL PRESSURE INDICATOR

Indicator will light and service required indicator will flash when transmission oil pressure is low.

018;T6201AV 02T;25 M146. 211188

TRANSMISSION OIL FILTER INDICATOR

Indicator will light when transmission filter element is restricted.

018;T6201AX 02T;25 M147. 121288

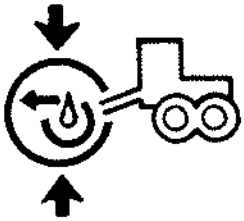
HYDRAULIC OIL FILTER INDICATOR

Indicator will light when hydraulic filter element is restricted.

018;T6201AY 02T;25 M148. 211188

HYDRAULIC FRONT WHEEL DRIVE CHARGE PRESSURE INDICATOR—FRONT WHEEL DRIVE UNITS ONLY

Indicator will light when HFWD charge pressure is low.



018;T6201AZ 02T;25 M149. 211188

HYDRAULIC FRONT WHEEL DRIVE OIL FILTER INDICATOR—FRONT WHEEL DRIVE UNITS ONLY

Indicator will light when HFWD filter is restricted.

018;T6201BA 02T;25 M150. 211188

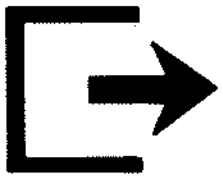
LEFT TURN SIGNAL INDICATOR

Indicator will light when left turn signal switch is engaged.

018;T6201BG 02T;25 M151. 211188

SADDLE LOCK INDICATOR

Indicator will light when locking pin is disengaged.



018;T6201BH 02T;25 M152. 211188

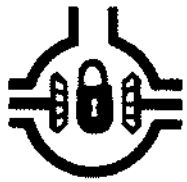
PARK BRAKE INDICATOR

Indicator will light when park brake is engaged.

018;T6201BI 02T;25 M153. 121288

DIFFERENTIAL LOCK INDICATOR

Indicator will light when differential is locked.



018;T6201BJ 02T;25 MI54. 211188

RIGHT TURN SIGNAL INDICATOR

Indicator will light when right turn signal switch is engaged.

018;T6201BK 02T;25 MI55. 211188

ENGINE WARM-UP

1. After engine starts, run at one-third speed for 30 seconds. Do not run at fast or slow idle. Do not accelerate rapidly during warm-up.

2. Operate machine at less-than-normal loads and speeds until engine is at normal operating temperature.

02T;25 MI56. 211188

ENGINE COLD WEATHER WARM-UP

NOTE: If hydraulic oil is cold, hydraulic functions move slowly. Do not attempt grader operations until hydraulic functions operate normally and transmission oil pressure indicator light is out.

1. Run engine at one-third speed for five minutes.

2. Operate all hydraulic functions before moving machine.

3. The grader is ready to operate under load when transmission oil pressure indicator light goes out.

NOTE: When the grader must operate for several months in cold temperatures, install a 195°F (91°C) thermostat (180°F [82°C] thermostat is standard equipment). Install the standard thermostat for warm weather operation.

02T;25 M157, 060189

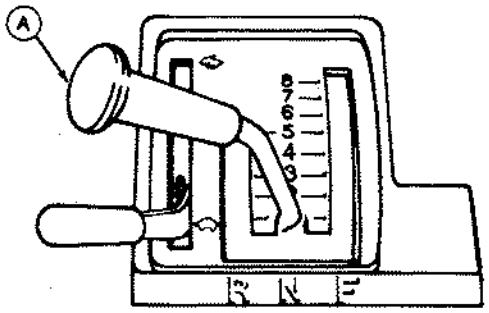
STOPPING THE ENGINE

IMPORTANT: Turbocharger may be damaged if engine is not properly shut down.

If engine stops when operating under load, remove load. Restart engine immediately.

1. Move transmission selector (A) to neutral.

2. Engage park brake.



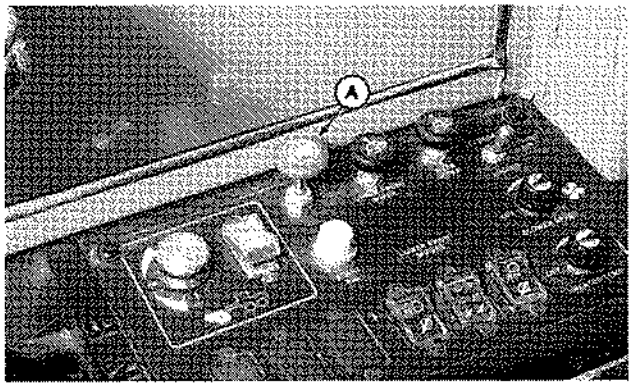
91A;T6201802 02T;25 M158, 211188

3. Lower all equipment to ground.

4. Operate at half speed without load for two minutes.

5. Move speed control lever to slow idle. Pull fuel shut-off knob (A) out until engine stops. Push knob in.

6. Turn key switch off and remove key.



091;T6921AR6 02T;25 M159 211188

1T4;0025 12 090189

EMERGENCY STOPPING

CAUTION: Do not shift transmission to neutral or depress inching pedal. Engine braking will be lost.

1. Apply service brake. A stored energy accumulator will provide limited use of service brakes.

2. Apply park brake.

NOTE: After park brake is used for an emergency stop, check the adjustment. (See Adjust Park Brake in Maintenance chapter.)

3. Lower blade to ground if engine is running.

02T;25 M160. 060189

ADJUSTING ENGINE FOR HIGH ELEVATION

IMPORTANT: The engine may be seriously damaged at high elevations unless you have the fuel injection pump adjusted.

If you operate the engine above 10,000 (3 000 m) without this adjustment, the warranty on this engine will be invalid.

The fuel injection pump adjustment must be changed by a service station approved to work on injection pumps. See your John Deere dealer for this service.

02T;25 M161. 211188

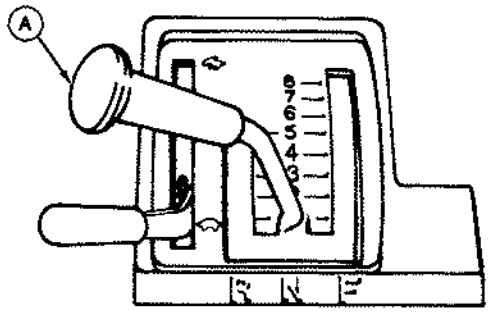
Driving the Grader

SHIFTING THE TRANSMISSION

Move transmission selector lever (A) to neutral before starting engine or dismounting from machine.

Move lever one gear at a time. It is not necessary to use inching pedal when shifting gears.

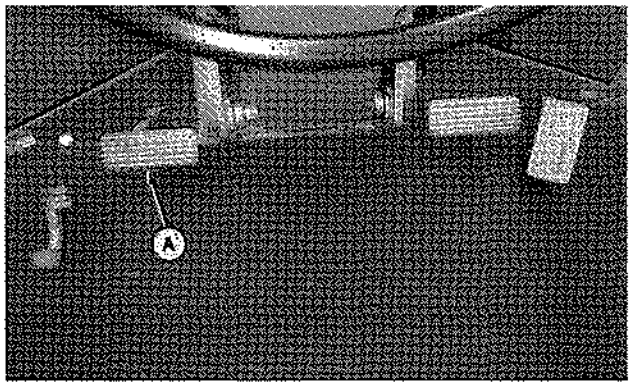
IMPORTANT: To prevent transmission damage, never coast downhill with transmission in neutral or with clutch pedal depressed. This can cause overspeeding of transmission parts.



91A;T6201B02 02T;30 M71. 211188

INCHING (CLUTCH) PEDAL

Push inching pedal (A) down to disengage clutch. Use this pedal for precise control.



91A;T6180A12 02T;30 M72. 121288

TRAVEL SPEEDS

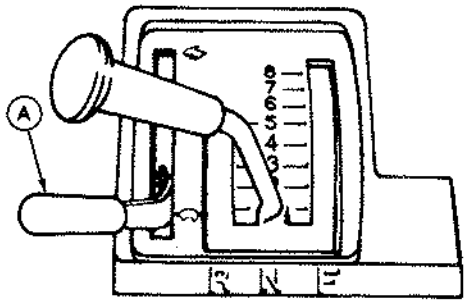
Forward Speeds	mph	km/h	Reverse Speeds	mph	km/h
1	2.3	3.7	1	2.8	4.5
2	3.2	5.1	2	3.9	6.3
3	4.8	7.7	3	5.9	9.5
4	6.3	10.1	4	7.6	12.2
5	8.2	13.2			
6	10.5	16.9			
7	14.1	22.7			
8	23.9	38.5			

T82;30 C11 060186

1T4;0030 01 090189

ENGINE SPEED CONTROL LEVER

Use speed control lever (A) to set engine speed. Move lever forward to increase speed. Move lever backward to decrease speed.

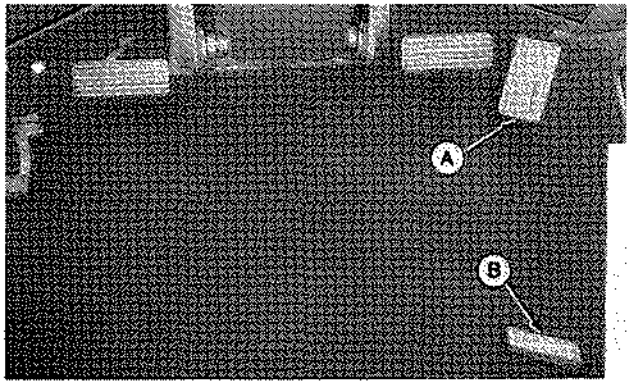


91A;T6201B01 02T;30 M74. 211188

ACCELERATOR AND DECELERATOR PEDALS

Push down accelerator pedal (A) to increase engine speed. When accelerator is released, engine will return to speed control lever setting.

Push decelerator pedal (B) down to decrease engine speed. When decelerator is released, engine speed will return to speed control lever setting.



91A;T6180AI3 02T;30 M75. 211188

PARK BRAKE LEVER AND PARK BRAKE LOCK

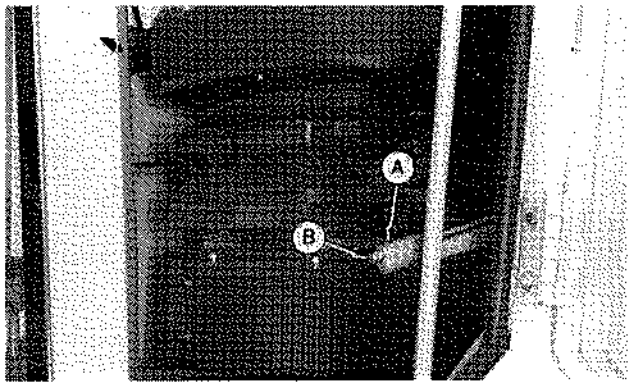
CAUTION: Always engage park brake before dismounting. Before disengaging park brake, be sure service brske is operational.

After using psrk brake for sn emergency stop, check adjustment of park brake. See Adjust Park Brske in Maintenance chapter.

IMPORTANT: Disengage psrk brake before shifting into gear to avoid damaging park brake.

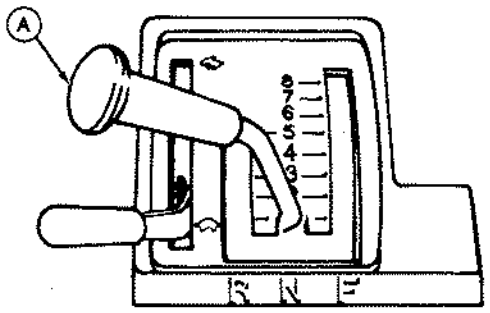
Pull park brake lever (A) up to engage brake. Be sure button (B) moves out to keep brake on.

To release brake, pull lever up, depress button in end of lever and move lever down.



91A;T6186AA1 02T;30 M76. 211188

PARKING THE GRADER



1. Move transmission selector lever (A) to neutral.

2. Engage park brake.

3. Lower all equipment to the ground.

IMPORTANT: Run engine at half speed NO LOAD for two minutes before stopping to avoid damage to turbocharger.

4. Run engine at half speed no load for one minute. Move speed control lever to slow idle.

5. Pull fuel shut-off knob out until engine stops. Push knob in.

6. Turn key switch off and remove key from switch.

91A;T6201BO2 02T;30 M77. 121288

LOCK ALL COMPARTMENTS

Your grader is equipped with locks on the side shields, service doors, cab door, fuel fill door and vandal shields (if equipped). Use these locks to help safeguard your machine.

02T;30 M78. 211188

BLADE LIFT LEVERS

Pull levers (A) to raise blade.

Push levers to lower blade.

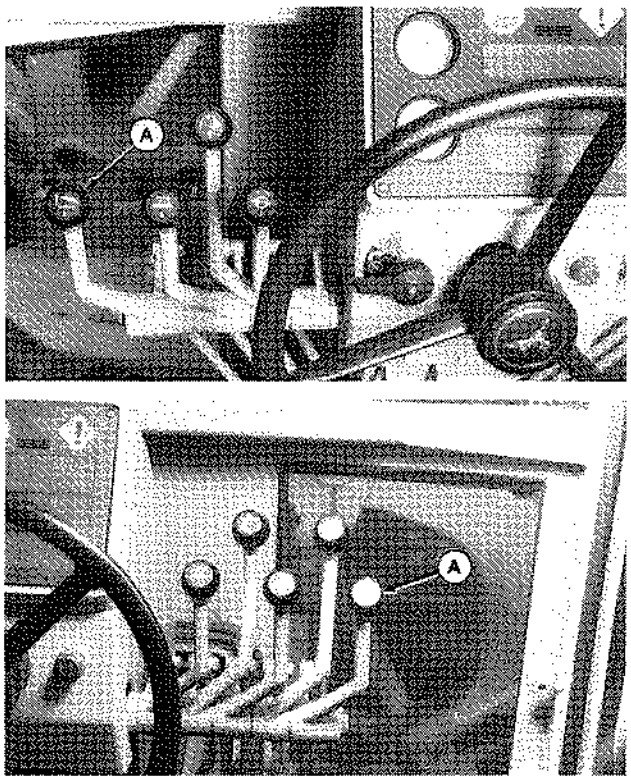
Push levers all the way forward into detent position for blade float.

Release blade float manually by pulling back on levers.

Blade float allows the blade to "float" over hard surfaces.

Use blade float in these ways:

1. To remove snow.
2. To move loose material on a hard-packed surface.
3. To match a hard surface with loose material. (Float only the blade end contacting hard surface.)

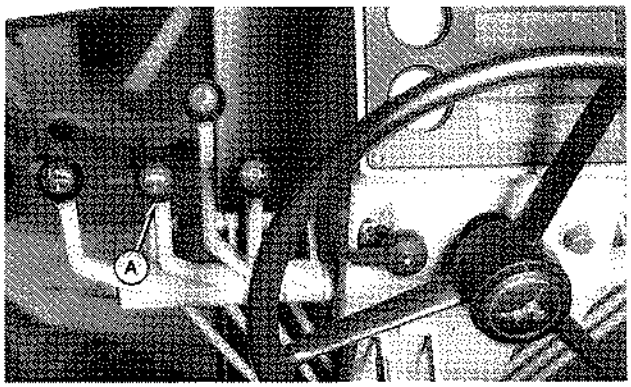


91A;T6180AG2, T6264AA5 02T;35 M141. 211188

BLADE SIDE SHIFT LEVER

Pull lever (A) to shift blade right.

Push lever to shift blade left.

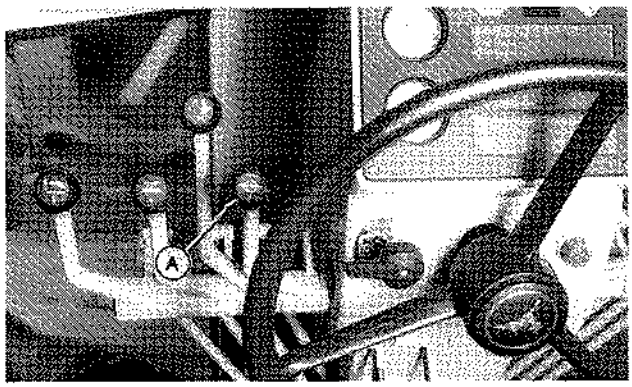


91A;T6180AG3 02T;35 M142. 211188

CIRCLE ROTATION LEVER

Pull lever (A) to rotate circle clockwise.

Push lever to rotate circle counterclockwise.

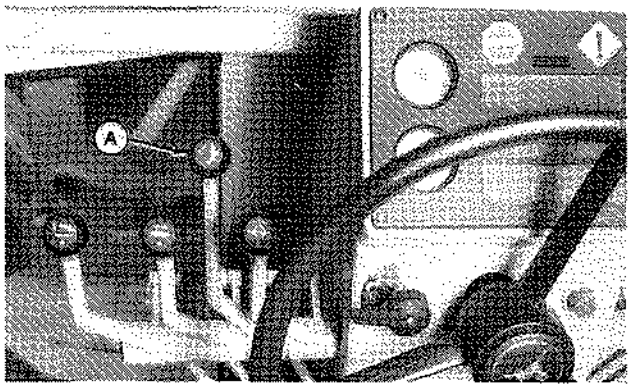


91A;T6180AG4 02T;35 M143. 211188

BLADE PITCH LEVER

Pull lever (A) to pitch blade to the rear (10° maximum).

Push lever to pitch blade forward (44° maximum).

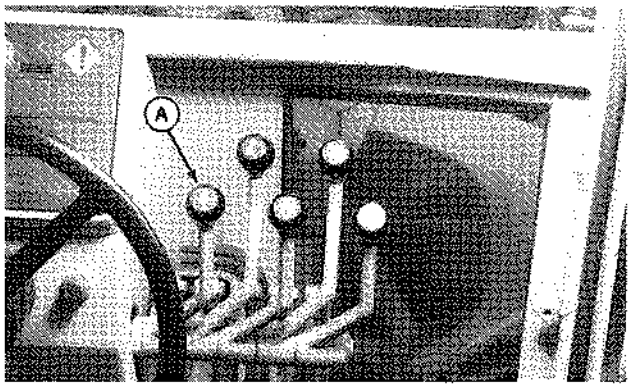


91A;T6180AG5 02T;35 M144. 100189

CIRCLE SIDE SHIFT LEVER

Pull lever (A) to shift circle right.

Push lever to shift circle left.



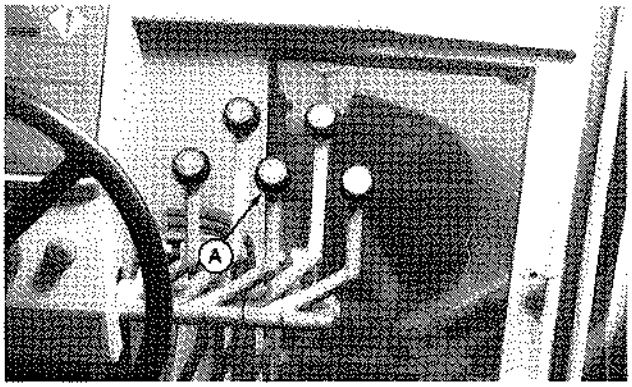
91A;T6264AA6 02T;35 M145. 211188

WHEEL LEAN LEVER

Pull lever (A) to lean wheels right (20° maximum).

Push lever to lean wheels left (20° maximum).

Lean wheels:
1. Toward the windrow when making a heavy cut.
2. To make a shorter turn.



91A;T6264AA3 02T;35 M146. 211188

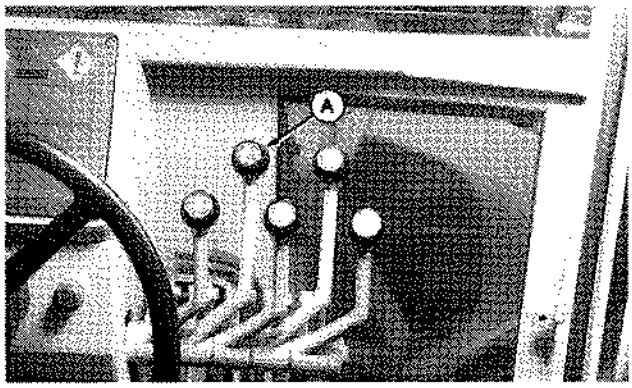
REAR STEER LEVER

Pull lever to steer grader right (25° maximum).

Push lever to steer grader left (25° maximum).

Use rear steer:

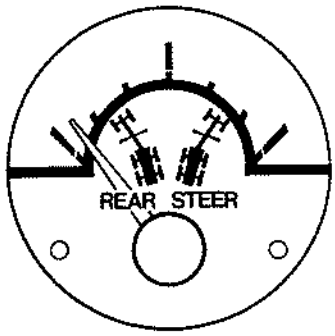
1. To place rear wheels on solid ground while oftset front wheels are on wet or unstable ground.
2. With wheel lean to make short turn.
3. With hydraulic front wheel drive as needed.



91A;T6264AA4 02T;35 M147. 211188

REAR STEER INDICATOR

Gauge shows direction and amount of rear steer.



91A;T6263AF 02T;35 M148. 211188

DIFFERENTIAL LOCK

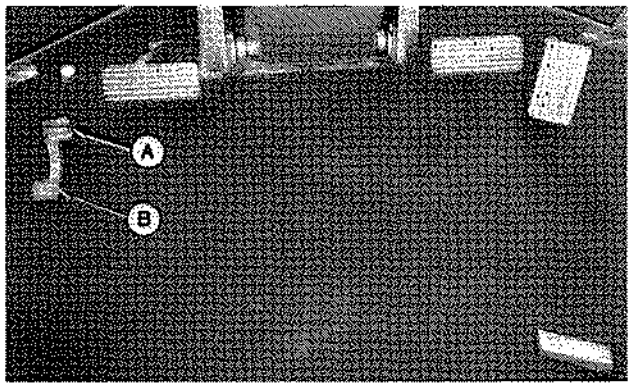
NOTE: Use differential lock when conditions require maximum traction.

Engage differential lock by pushing down front (A) of pedal.

Release differential lock by pushing down back (B) of pedal.

Differential can be locked or released when grader is moving or stopped.

Release differential to make shorter turns and reduce tire wear.



91A;T6180A11 02T;35 M349. 100189

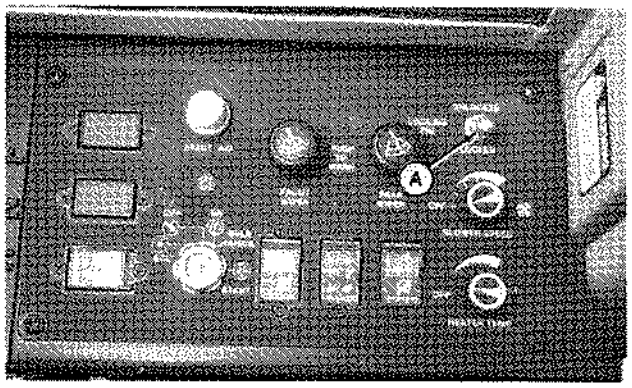
DISENGAGING AND ENGAGING LIFT ARM LOCKING PIN

1. Center circle and blade under grader. Lower blade to ground.

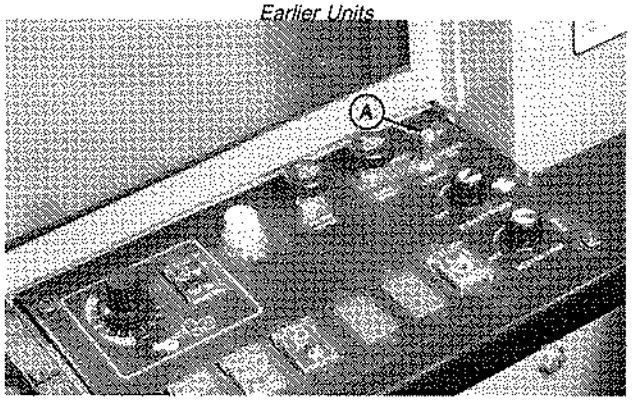
2. Move blade lift levers to float position.

CAUTION: Do not unlock locking pin unless blade is on ground or blade will drop suddenly.

3. Pull and move locking pin switch (A) to unlocked position. If locking pin will not disengage, shift circle slightly to remove pressure from pin.



Earlier Units



Later Units

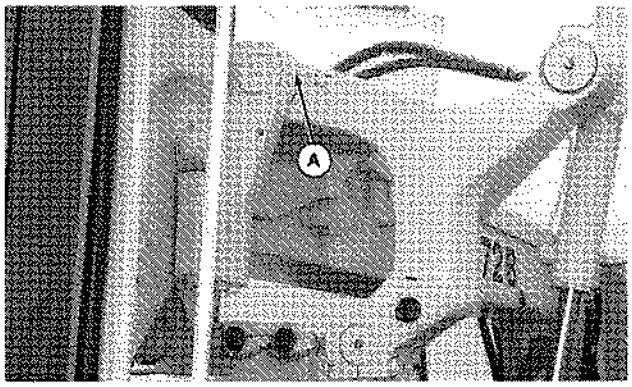
91A;T6175AF3, T6913AH 02T;35 K151, 110189

Locking pin indicator light will come on when pin is disengaged.

4. Move lift arm to the desired position. Check position on lift arm indicator (A).

5. Engage lock pin. If locking pin will not engage, shift circle slightly to align locking pin with locking hole.

Locking pin indicator light will go out when locking pin is engaged.



91A;T6164BE1 F82;35 C50 070186

1T4;0035 04 090189

MOVING BLADE TO BANK POSITION

CAUTION: Clear people away from grader before moving blade to bank position.

NOTE: These instructions are for moving blade to right bank position. Use opposite functions to move blade to left bank position.

1. Position the circle sightly to right of center.

2. Shift blade to the right.

3. Lower blade to the ground.

4. Move blade lift levers to float position.

5. Disengage lift arm locking pin.

6. Retract left lift cylinder and circle side shift cylinder and extend right lift cylinder to rotate lift arms.

7. Align lift arm indicator with desired locking position and engage locking pin.

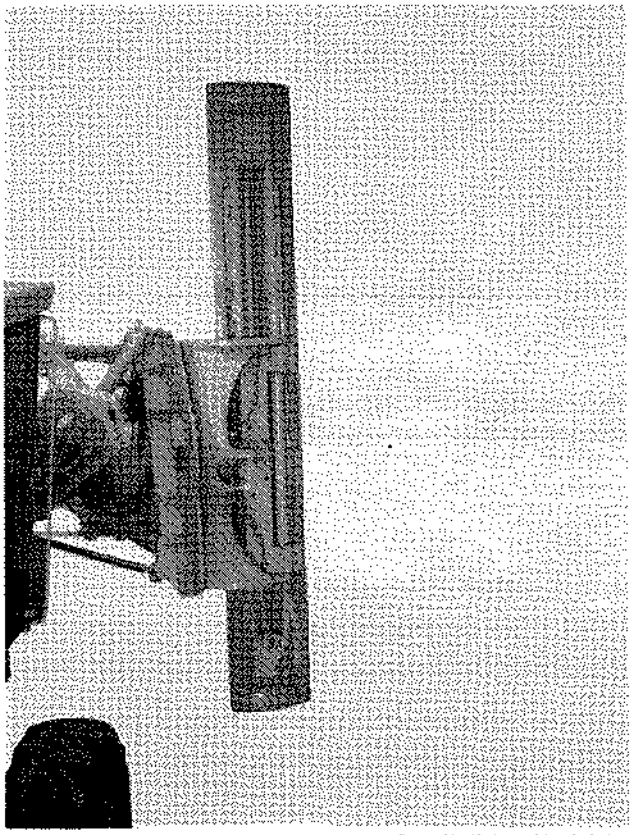
91A;T6181AO T82;35 C38 080186

8. Using lift cylinders and circle side shift cylinder, lift blade off ground 4—5 inches.

9. Rotate blade counterclockwise to put right end of blade forward.

10. Retract right lift cylinder, extend leff lift cylinder, rotate circle, adjust circle side shift cylinder and pitch, and sideshift blade to obtain desired blade position.

11. Follow steps in reverse order to move blade out of bank position.



91A;T6164CH T82;35 C39 160186

BALLAST

When ballast and/or approved allied equipment is used on the grader, maximum axle weights are:

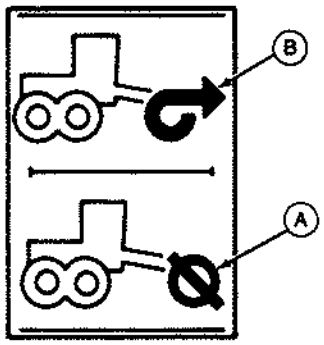
Front Axle: 14,325 lb (6 500 kg)
Rear Axle: 27,000 lb (12 250 kg)

NOTE: Too much ballast may wear power train parts faster than normal and could affect the warranty. Check your warranty.

02T;35 M152, 211188

HYDRAULIC FRONT WHEEL DRIVE CONTROLS—FRONT WHEEL DRIVE UNITS ONLY (SERIAL # -520351)

IMPORTANT: Before charging batteries, using booster batteries, or welding on the grader, turn hydraulic front wheel drive system OFF (A).



Front wheel drive engages only when rear wheels are turning. Standard speed front wheel drive operates in 1st through 4th gears, forward and reverse. High speed front wheel drive operates in 1st through 6th gears, forward and reverse.

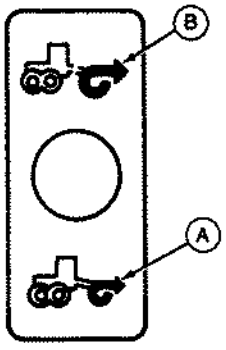
A—Hydraulic Front Wheel Drive OFF

B—Hydraulic Front Wheel Drive ON

91A;T6221AE 02T;35 M154, 211188

In normal front wheel drive action (A), front wheel drive engages only when rear wheels slip. Front wheel motor turns slightly slower than rear wheels.

In aggressive front wheel drive action (B), front wheel drive is engaged at all times. Front wheels turn slightly faster than rear wheels. Use aggressive mode in difficult conditions on side slopes, in wet or slippery spots, and for improved front end steering control. Move switch to normal when conditions improve.



91A;T6221AF T82;35 C53 080186

1T4;0035 06 090189

OPERATING TIPS

Motor graders can be steered with the frame straight, articulated, or offset.

Straight frame steering is normally used for long grader passes, such as road maintenance.

Articulating the frame shortens turns in confined areas and lets the operator counteract the side thrust in normal grading.

Offset steering lets an operator keep rear tandems on solid ground in ditch cleaning and places the most machine weight behind the load in heavy grading.

02T;35 M155. 211188

Blade angle: Sharper blade angles reduce the distance dirt must be carried in moving from front to rear of blade and thus allow deeper cuts and heavier grading.

Blade pitch: Blade should normally be pitched vertically or slightly forward. Tipping the blade forward allows material to roll along the blade—good for spreading and compacting material. Tipping blade backward permits better cutting action, but reduces rolling of material along the blade angle.

To counteract side thrust on machine caused by blading:

1. Lean top of front wheels toward heel (discharge side) of blade.

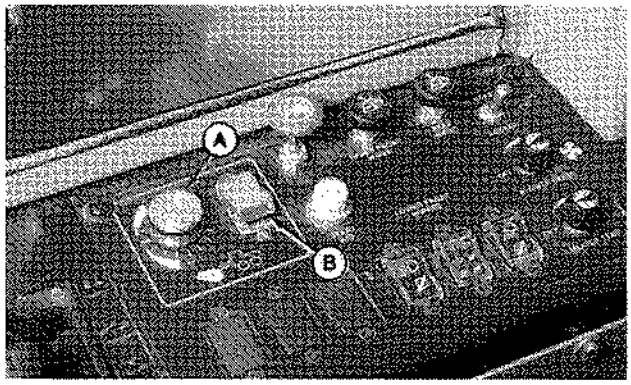
2. Articulate machine slightly toward toe of blade.

02T;35 M164 211288

HYDRAULIC FRONT WHEEL DRIVE (HFWD) CONTROLS—FRONT WHEEL DRIVE UNITS ONLY (SERIAL NO. 520352—)

IMPORTANT: Before charging batteries, using booster batteries, or welding on the grader, turn hydraulic front wheel drive system OFF at switch (A).

Front wheel drive engages only when rear wheels are turning. Standard speed front wheel drive operates in 1st through 4th gears, forward and reverse. High speed front wheel drive operates in 1st through 6th gears, forward and 1—4 reverse.



91A,T6921AR9 02T,35 M156. 211188

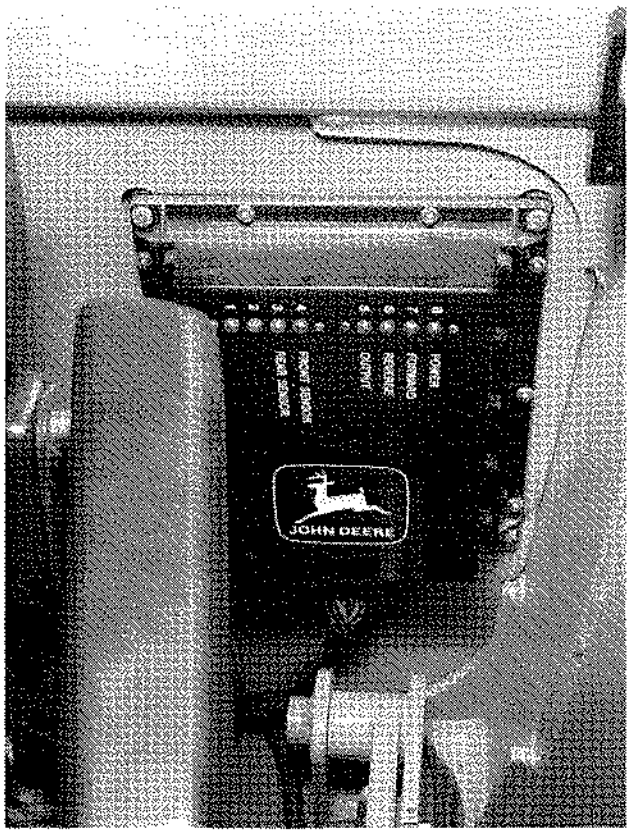
HYDRAULIC FRONT WHEEL DRIVE CONTROL BOX BULB CHECK

When the key switch is turned on, all lights on the control box will come on for one second to check the bulbs. If the HFWD switch is off, all lights will go out after the bulb check except for the power light. The power light is on whenever key switch is turned on.

If the HFWD switch is turned on before the key switch, some lights will remain on after the bulb check. See Control Box Light Operation In Diagnostic Mode.

02T,35 M157. 211188

HFWD CONTROL BOX LIGHT OPERATION IN DIAGNOSTIC MODE (SERIAL NO. 520352—)



The lights in this mode are used to check the operation of the aggressive switch and to verify which model plug is installed into the HFWD wiring harness.

To put the HFWD control box in the diagnostic mode, turn the HFWD switch on and then turn the key switch to on.

All lights on control box will come on for one second to check the bulbs and then some of the lights will go out.

NOTE: Indicator lights will change to a normal operating mode when the transmission selection lever is moved to a gear.

The following indicator lights must come on as the aggressive mode switch is turned from least aggressive (−) position to the most aggressive (+) positions:

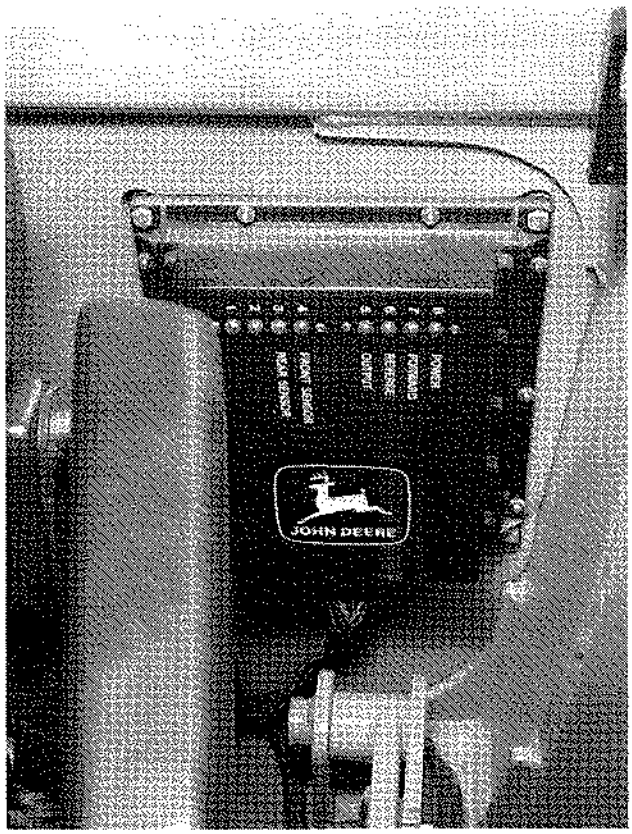
NOTE: The power light should be on whenever key switch is turned on.

Light numbers 5—7 indicate which model plug is installed in harness.

	Light No.			
Position	**1**	**2**	**3**	**4**
1 (CCW)	X			
2		X		
3	X	X		
4			X	
5	X		X	
6		X	X	
7	X	X	X	
8 (Center)			X	
9	X		X	
10	X		X	
11	X	X		X
12		X	X	
13	X		X	X
14		X	X	X
15 (CW)	X	X	X	X

	Light No.		
Model #	**5**	**6**	**7**
672B #Std			
672B #HS		X	
772B #Std		X	
772B #HS	X	X	
772BH #Std		X	
772BH #HS	X	X	

HFWD CONTROL BOX LIGHT OPERATION IN NORMAL OPERATING MODE (SERIAL NO. 520352—)



1—2. Not lit in normal operating mode. Used only to check operation of aggressive switch with control box in diagnostic mode.

3. Rear Sensor light indicates that the rear sensor, harness and connectors are functioning properly. (Machine must be moving).

4. Front Sensor light indicates that the front sensor, harness and connectors are functioning properly. (Machine must be moving).

5. Output light is lit indicating that there is a voltage output to the solenoid on the hydrostatic pump. No check is made to verify harness or solenoid connections. The output light should be on only when the machine is in motion.

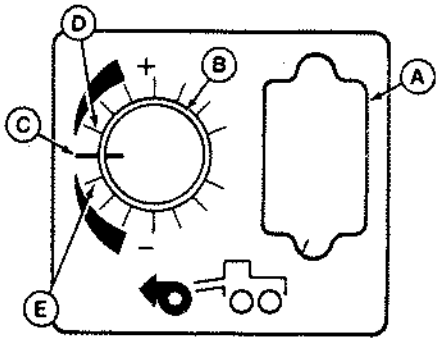
6. Reverse light indicates that the reverse cam switch, 1—4, or 1—6 cam switch and clutch cam switch are closed.

7. Forward light indicates that the forward cam switch, 1—4 or 1—6 cam switch and clutch cams witch are closed.

8. Power light indicates power to the control box. Light should be ON whenever the key is turned on.

91A;T6913AG 02T;35 M159. 211188

AGGRESSIVENESS SWITCH OPERATION (Serial No. 520352—)



With HFWD ON/OFF switch (A) ON and engine ON:
Front wheel drive will engage when rear wheels turn.

Front wheels will turn at same speed as back wheels when aggressive mode switch (B) is set in the center (C) position. For each position the switch is turned clockwise (D) the front wheel speed will increase 1/2%. For each position counter-clockwise (E), the front wheel speed will decrease by 1/2%.

Fuel is conserved and front tire wear is minimized when the aggressive mode switch is set on the minus side of the dial. The plus side is usually used in operations where continuous rim pull is necessary on the front wheel for front end stability.

A—ON/OFF switch
B—Aggressive mode switch
C—Center position
D—1/2% higher wheel speed
E—1/2% lower wheel speed

91A;T6921AX 02T;35 M160. 191288

HFWD MANUAL MODE OPERATION (SERIAL NO. 520352—)

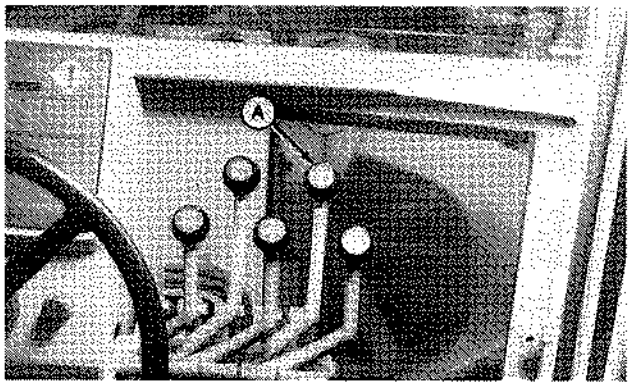
If the HFWD front sensor circuit would fail, the front wheel will go to maximum speed since the control box would not get a signal from the front sensor to indicate that the wheels are turning. If this happens, the front wheel drive can be operated manually as follows:

1. Turn aggressive switch to the full counterclockwise position.

2. Turn aggressive switch clockwise until the front wheel pull meets the operating conditions.

02T;35 K147. 191288

OPERATING SCARIFIER AND BULLDOZER BLADE

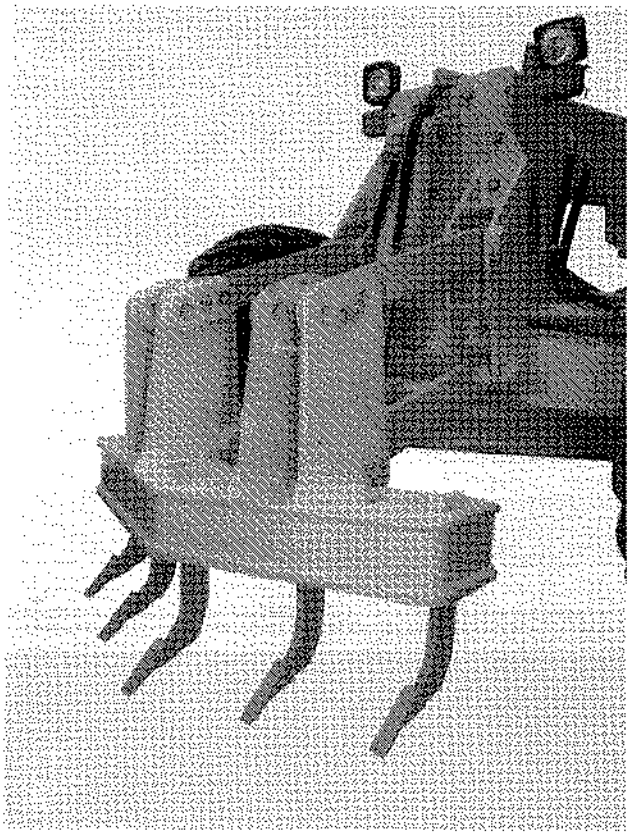


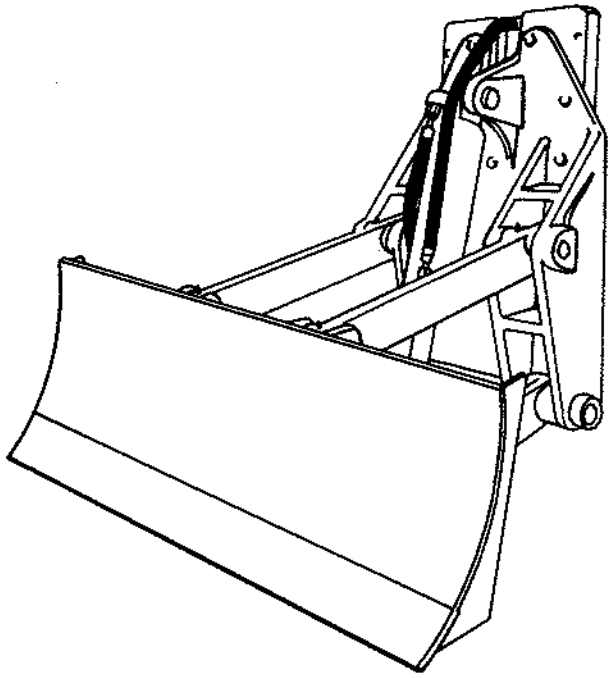
Pull lever (A) to raise attachment.

Push lever to lower attachment.

Push lever all the way forward into detent position to float attachment.

Release float manually by pulling back on lever.



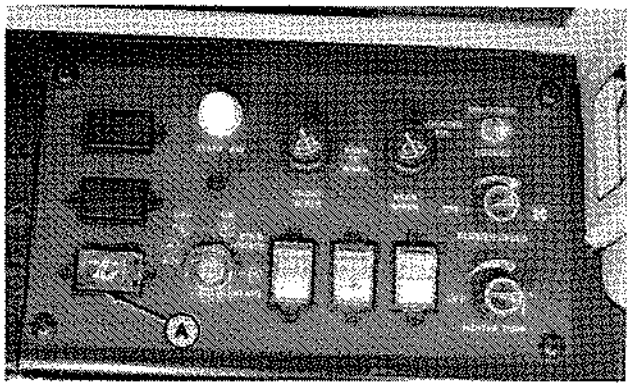


91A;T6264AA2, T6238AI, T6238AW 02T;35 M162. 211188

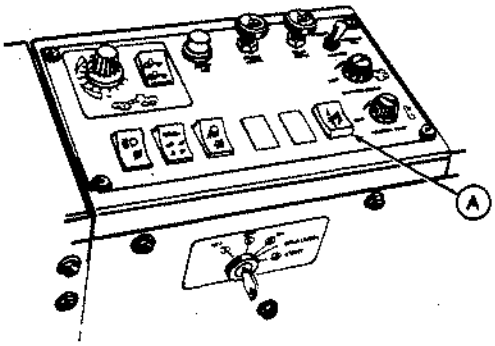
OPERATING RIPPER

Push down front end of switch (A) to lower ripper.

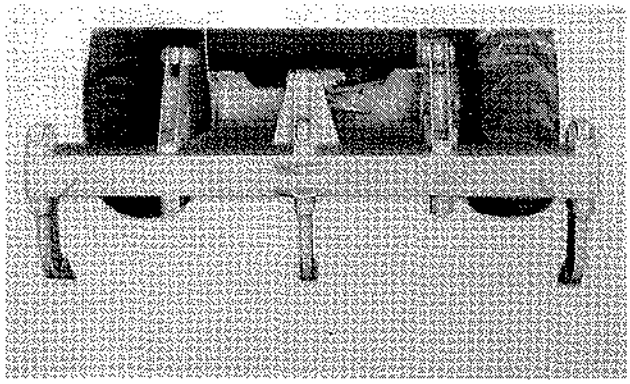
Push down rear end of switch to raise ripper.



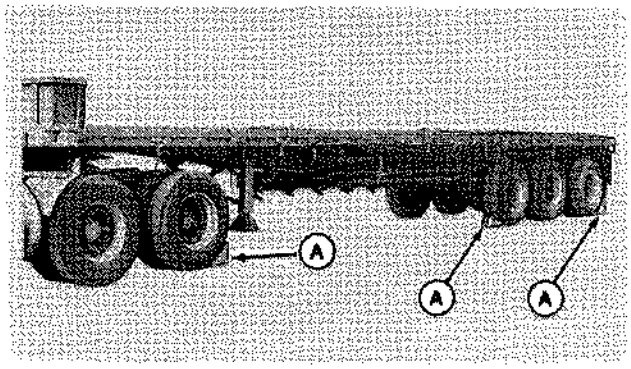
Earlier Units



Later Units



LOADING MACHINE ON A TRAILER



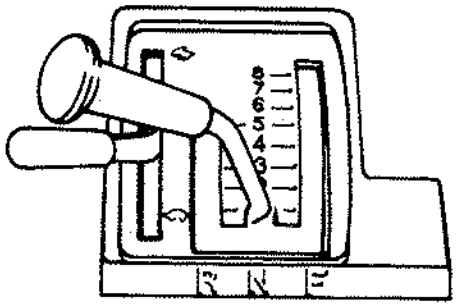
1. Keep trailer bed clean. Put chocks (A) against truck wheels.

2. Use a ramp or loading dock. Ramps must be strong enough, have a low angle, and correct height. Load and unload machine on a level surface.

3. Drive machine onto ramps slowly. Centerline of machine should be over the centerline of the trailer. Put chocks against grader wheels.

018;T87155 02T;40 M36. 211188

4. Lower all equipment onto blocks or trailer bed. Blade must not extend beyond truck bed.



5. Move transmission selector lever to neutral.

6. Engage park brake.

7. Run engine at half speed for one minute.

8. Stop engine. Remove key.

91A;T6218BA T82;40 C2 121288

IMPORTANT: Tape the exhaust pipe opening closed to prevent air entry.

Do not put chains over or against hydraulic lines or hoses.

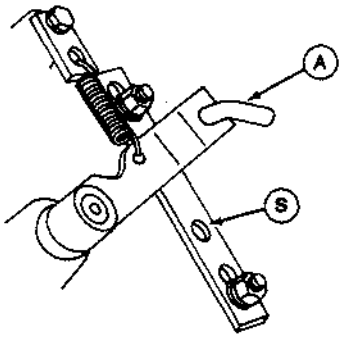
9. Fasten grader to trailer with chains or cables.

NOTE: An over width permit may be required to transport a grader with 17.5—25 tires.

T82;40 C3 211188

1T4;0040 01 090189

TOWING PROCEDURES



CAUTION: Operator must be in operator's seat to control steering and brakes. Steering, brakes, and transmission may be operational depending on type of failure.

IMPORTANT: Do not tow the grader faster than 25 mph (40 km/h).

Engine cannot be started by towing. Damage to transmission will result.

1. Secure blade, scarifier, and ripper in the up position.

IMPORTANT: Before towing the grader, move the tow lever to TOW position to avoid damage to transmission.

NOTE: Tow lever is inside and below right engine compartment opening.

2. Pull tow lever (A) out.
3. Move tow lever forward to hole (B).
4. Move transmission selector lever to neutral.
5. Release park brake.
6. Fasten tow bar or chain to frame.
7. Run the engine for braking and steering power.
8. If engine will not run, tape exhaust pipe cover closed.

91A;T6186AZ 02T;40 M37. 211188

Fuels and Lubricants

FUEL SPECIFICATIONS

Use ONLY clean, high-quality fuel.

Use Grade No. 2-D fuel above 40°F (4°C).

Use Grade No. 1-D fuel below 40°F (4°C).

Use Grade No. 1-D fuel for all air temperatures at altitudes above 5000 ft (1 500 m).

IMPORTANT: If fuel sulfur content exceeds 0.5 per cent, the engine oil drain interval must be reduced by 50 per cent (to 125 hours).

Use fuel with less than 1.0 per cent sulfur. If possible, use fuel with less than 0.5 per cent sulfur.

For maximum filter life, sediment and water should not be more than 0.10 per cent.

The cetane number should be 40 minimum. If you operate your machine where air temperatures are normally low or where altitudes are high, you may need fuel with a higher cetane number.

Cloud Point—For cold weather operation, cloud point should be 10°F (6°C) below lowest normal air temperature.

02T;45 M31. 100189

FUEL STORAGE

NOTE: Diesel fuels stored for a long time may form gum or bacteria and plug filters.

Keep fuel in a clean container in a protected area. Water and sediment must be removed before fuel gets to the engine. Do not use de-icers to remove water from fuel. Do not depend on fuel filters to remove water.

If possible, install a water separator at the storage tank outlet. (See your John Deere dealer).

IMPORTANT: Keep all dirt, scale, wster or other foreign material out of fuel.

Store fuel drums on their sides.

02T;45 K8. 180387

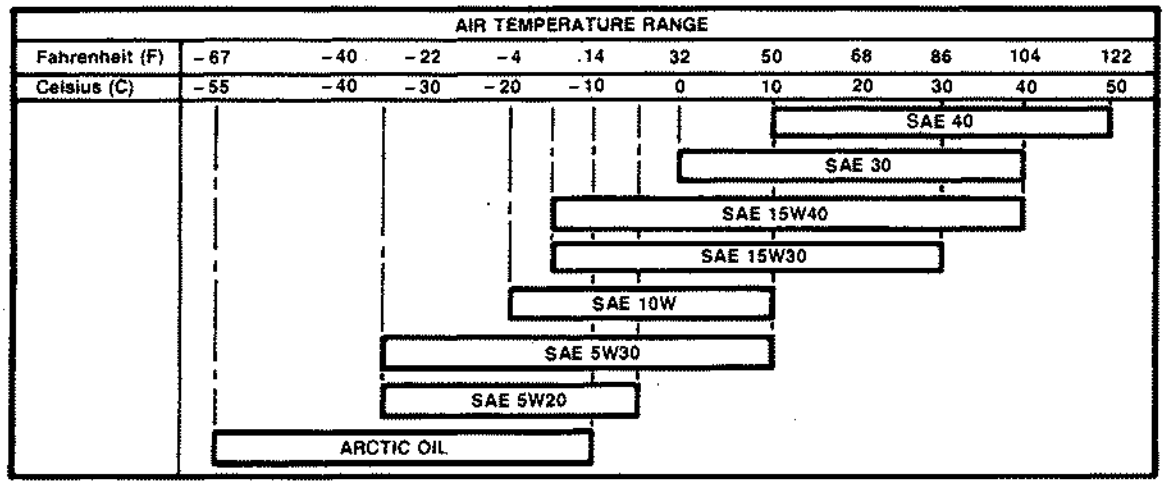
FUEL TANK

CAUTION: Handle fuel carefully. If the engine is hot or running, do not fill the fuel tank. Do not smoke while you fill fuel tank or work on fuel system.

To avoid condensation, fill the fuel tank at the end of each day's operation.

02T;45 M32. 191288

ENGINE OIL



Depending upon the expected air temperature range between oil changes, use oil viscosity shown on the temperature chart above.

Additives are not required nor recommended.

John Deere TORQ-GARD SUPREME® engine oil is recommended because it is a specifically balanced formulation to provide maximum engine life. It provides excellent protection against mechanical wear, carbon deposits, and lacquer formation, plus providing superior cold weather starting performance.

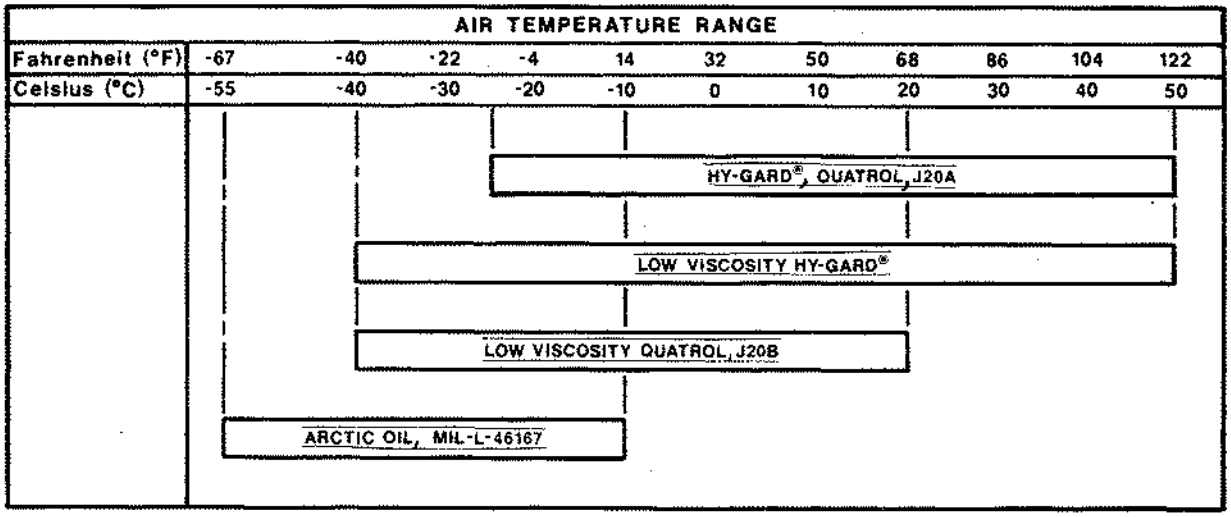
If other oils are used, they must have one of the following specifications:

Oil Specification	Use
API Service: CD/SF, CD/SE, CD/SD, CD/SC, or MIL-L-2104C, MIL-L-2104D	Recommended
*API Service CC/SF, CC/SE, CC/SD, CC/SC or *MIL-L-46152, *MIL-L-46152B	For SAE 5W20, SAE 5W30 and arctic oil only, use if recommended oil is not available.
*MIL-L-46167A	For arctic oil only

**Change oil at one-half the normal interval.*

038;T6921AP 02T;45 M33. 100189

TRANSMISSION-HYDRAULIC, TANDEM DRIVE, AND WHEEL MOTOR OIL



Depending on the expected air temperature range between oil changes, use oil viscosity shown on the chart above.

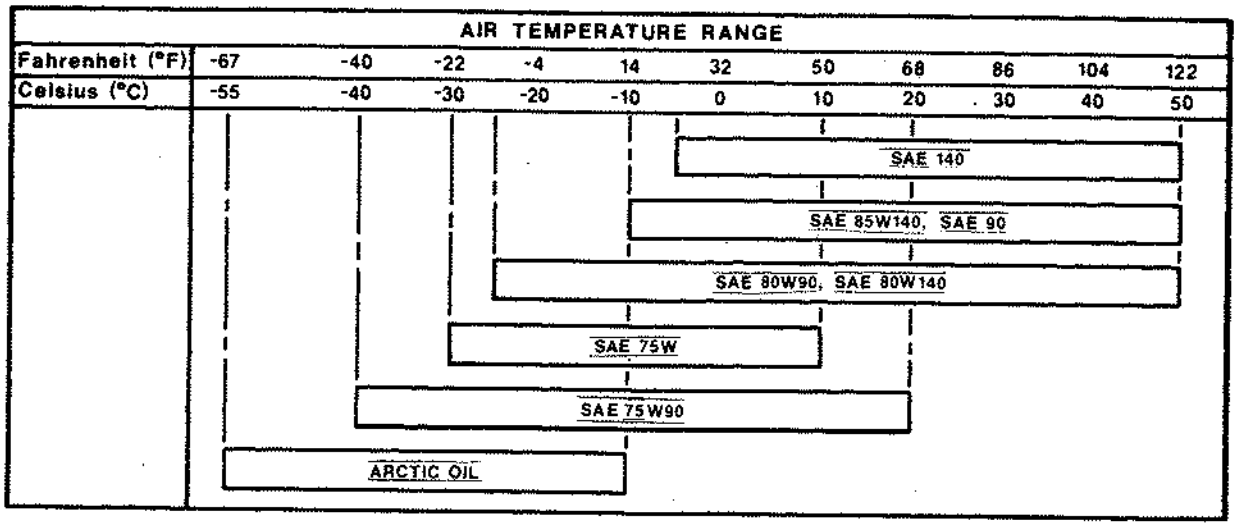
John Deere HY-GARD® transmission and hydraulic oil is recommended because it is specifically formulated to provide maximum protection against mechanical wear, rust, corrosion, and foaming.

You may also use QUATROL® oils, which are oils that meet John Deere standards, or other oils meeting John Deere Standard J20A or J20B.

Oil meeting MIL-L-46167 may be used as an arctic oil.

018;T6234AF 02T;45 M34 211188

CIRCLE DRIVE GEARBOX OIL



Depending upon the expected air temperature range between oil changes, use oil viscosity shown on the temperature chart above.

The following oils are recommended:

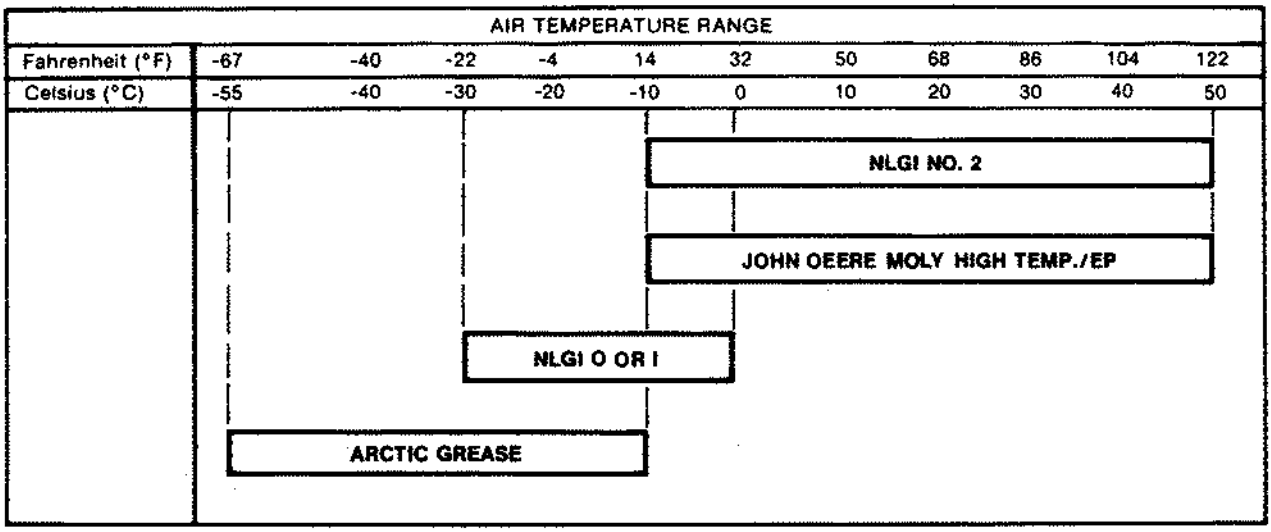
John Deere API GL-5 Gear Oil.

Oils meeting API Service GL-5 (MIL-L-2105B or MIL-2105C).

Oil meeting MIL-L-10324A may be used as arctic oil.

018;T6234AG 02T;45 M35. 110189

GREASE



Depending on the expected air temperature range during use, use grease shown on chart above.

Greases recommended are:

John Deere Moly High Temperature/EP grease (preferred).

SAE Multipurpose Grease with Extreme Pressure (EP) performance and containing 3 to 5 per cent molybdenum disulfide (preferred).

SAE multi-purpose EP grease.

Grease meeting MIL-G-10924C specifications may be used as arctic grease.

018;T6722AA 02T;45 C49. 261088

ALTERNATIVE LUBRICANTS

Additional information on cold weather operation is available from your John Deere dealer.

Conditions in certain geographical areas may require special lubricants and lubrication practices which do not appear in this operator's manual. If you have any questions, consult your John Deere dealer to obtain the latest information and recommendations.

053;ALTER. 050886

LUBRICANT STORAGE

Your equipment can operate at top efficiency only if clean lubricants are used.

Use clean containers to handle all lubricants.

Store lubricants and containers in an area protected from dust, moisture, and other contamination.

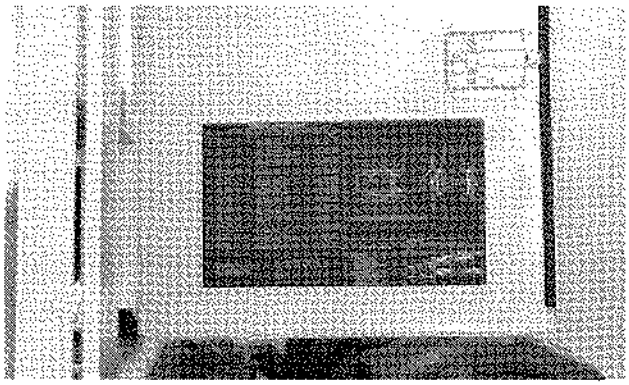
053;LUBST. 290288

Periodic Maintenance

SERVICE YOUR MACHINE AT SPECIFIED INTERVALS

Lubricate and make service checks and adjustments at intervals shown on the periodic maintenance chart and on the following pages.

Perform service on items at multiples of the original requirement. For example, at 500 hours, also service these items (if applicable) listed under 250 hours, 100 hours, 50 hours, and 10 hours or daily.

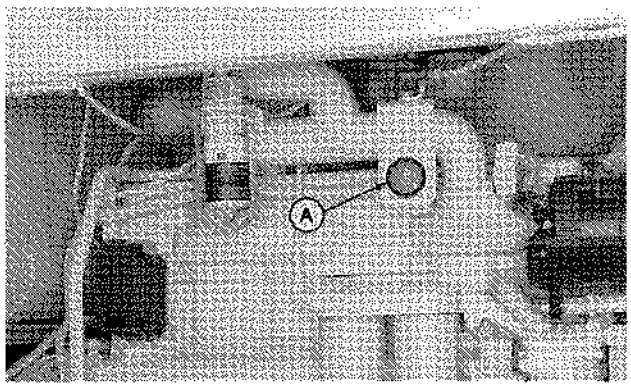


91A;T6189AD 03T;50 M79. 211188

CHECK THE HOUR METER REGULARLY

Use the hour meter (A) to determine when your machine needs periodic maintenance.

Intervals on the periodic maintenance chart are for operating in normal conditions. If you operate your machine in difficult conditions, you should service it at **shorter intervals.**



91A;T6179AI T82;50 C2 160186

USE CORRECT FUELS AND LUBRICANTS

IMPORTANT: Refer to the Fuels and Lubricants Chapter when performing maintenance on your machine.

NOTE: Factory fill oil for transmission and hydraulic systems has red dye added to help in locating leaks. When adding oil, use specified oils in the Fuels and Lubricants chapter.

03T;50 M81. 211188

PREPARE MACHINE FOR MAINTENANCE

Before performing maintenance procedures given in the following chapters, park the machine as described below unless another position is specified in the procedure.

1. Park machine on level surface.

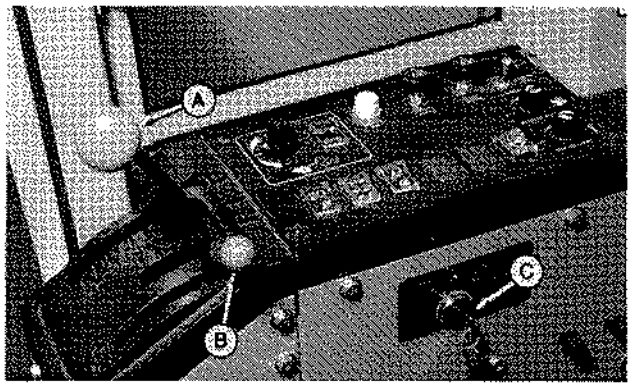
2. Lower all equipment to the ground.

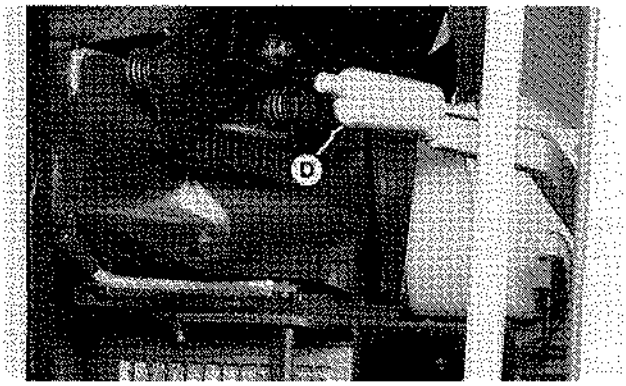
3. Move engine speed control lever (B) fully rearward. (If maintenance must be performed with engine running, do not leave machine unattended.)

4. Set park brake (D).

5. Move F-N-R lever (A) to neutral "N".

6. Turn key switch (C) OFF.





91A;T6913AM2, T6913AA3 03T;50 K128. 060189

MAINTENANCE AND REPAIR RECORD KEEPING SYSTEM

The checklist on the following pages summarizes scheduled maintenance, and parts and oil required at each maintenance interval.

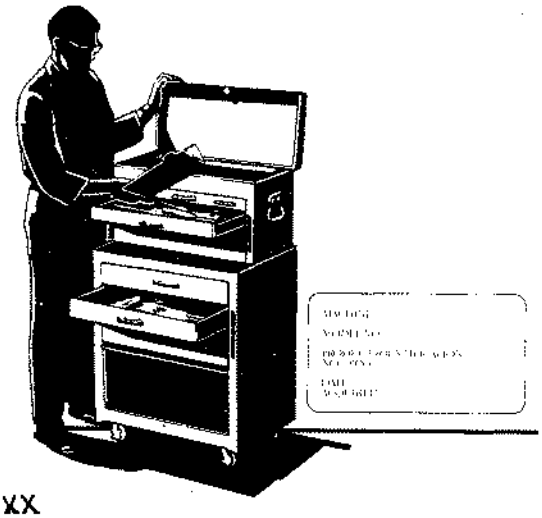
Use the checklist to:
- remind you to perform machine maintenance at specified intervals to minimize downtime.
- calculate cost of machine operation and ownership allowing you to make better job estimates.
- place yourself in a stronger position at trade-in time.
- satisfy your SECURE contract requirements

As maintenance is performed, check off each item on the list and record date and hour meter reading. Use the second (perforated) copy of this form (immediately preceding the Service Literature order form inside the back cover).

Do not tear out or mark on Checklist in the Periodic Maintenance chapter; keep it to make extra copies.

MARKS

MAINTENANCE and REPAIR RECORD KEEPING SYSTEM FOR JOHN DEERE MACHINE OWNERS



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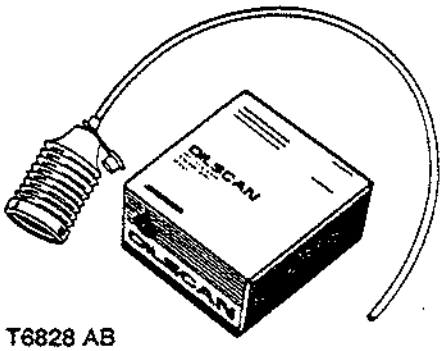
018;T6828AA 03T;50 MB2. 211188

OILSCAN™

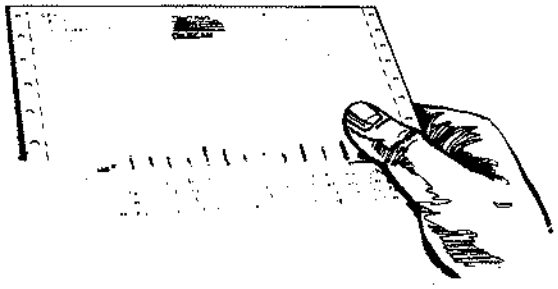
OILSCAN is a John Deere oil sampling program to help you monitor machine performance and identify potential problems before they cause serious damage.

Oil samples should be taken from each system prior to its recommended oil change interval.

OILSCAN kits are available from your John Deere dealer.



T6828 AB



018;T6828AB, T6829AB 03T;50 M83. 211188

MAINTENANCE AND REPAIR RECORD KEEPING SYSTEM

SERVICE INTERVALS

Service your machine at intervals shown on this chart. Also, perform service on items at multiples of the original requirement. For example, at 500 hours also service those items (if applicable) listed under 250 hours, 100 hours, 50 hours and 10 hours or daily.

As Required

- Check battery
- Check belts
- Grease lift arm locking pin holes
- Grease draft frame circle supports
- Check tires
- Grease circle
- Check air cleaner restriction
- Drain fuel tank sump
- Check precleaner

Every 10 Hours or Daily

- Check transmission and hydraulic oil level
- Check radiator coolant level
- Grease frame hinge pivots
- Check engine oil level

Every 50 Hours

- Grease lift cylinder yoke pivots
- Grease tie rod ends
- Grease front axle lean pivots
- Grease front axle lean cylinder pivots
- Grease front axle spindles
- Grease steering yokes and cylinder pivots
- Grease front axle pivot
- Grease frame steer cylinder pivot

REQUIRED PARTS

Insure machine performance and availability; use only genuine John Deere parts. Verify part numbers are current and that any associated parts are also on hand, i.e. filter O-rings.

		250 Hours	500 Hours	1000 Hours	2000 Hours
Engine Oil Filter	T19044	1	1	1	1
Fuel Filters	AR50041		2	2	2
Hydraulic Return Oil Filter	AR98098		1	1	1
Transmission Oil Filter	AR98098		1	1	1
HFWD Pump Return Filter	AT58368		1	1	1
Hydraulic Front Axle Return Filter	AT60645		1	1	1
Air Filter Primary	AT39124			1	1
Air Filter Secondary	AT31227			1	1
TORO-GARD SUPREME® Oil		20 qt (19 L)	20 qt (19 L)	20 qt (19 L)	20 qt (19 L)
TORO-GARD SUPREME® Oil (wheel motors if equipped)		2 gal (7.6 L)	2 gal (7.6 L)	2 gal (7.6 L)	2 gal (7.6 L)
HY-GARD® Transmission and Hydraulic Oil				16 gal (60.5 L)	26 gal (98.4 L)
OILSCAN Kit	IPSKIT1	1	2	4	7
API GL-5 Gear Oil				4 qt (3.8 L)	4 qt (3.8 L)
RE12842 Rust Inhibitor			1	1	1

03T;50 K129. 120189

MAINTENANCE AND REPAIR RECORD KEEPING SYSTEM

Model: 670B and 672B Motor Graders Customer: _____
PIN/Serial Number: _____ Delivery Date: _____ Hour Meter Reading: _____

OIL SAMPLING

Oil samples should be taken from each system prior to its recommended drain/change interval indicated on this form: 250, 500, 1000, 2000. Maintenance recommendations supplied by OILSCAN will be provided based upon the oil analysis and operating information you supply. Regular oil sampling will extend the operational life of your machine's systems.

Every 250 Hours

- ☐ Check battery water level
- ☐ Grease blade pitch cylinder pivots
- ☐ Grease lift arm locking pin
- ☐ Grease lift arms and cylinders
- ☐ Grease draft frame ball
- ☐ Check circle gearbox oil
- ☐ Replace engine oil filter
- ☐ Drain engine oil

Comments: _____

Date: _____ Hour Meter Reading: _____
Maintenance Performed By: _____

Every 500 Hours

- ☐ Check tandem oil level
- ☐ Add radiator conditioner
- ☐ Check brake accumulator
- ☐ Replace fuel filters
- ☐ Replace transmission oil filter
- ☐ Replace hydraulic return filter

Comments: _____

Date: _____ Hour Meter Reading: _____
Maintenance Performed By: _____

Every 1000 Hours

- ☐ Adjust engine valve lash
- ☐ Replace H.F.W.D. Pump Return Filter
- ☐ Drain transmission and hydraulic oil
- ☐ Replace hydraulic front axle return filter
- ☐ Replace hydraulic return filter
- ☐ Adjust engine speed linkage
- ☐ Clean engine crankcase vent tube
- ☐ Check air intake hoses

Comments: _____

Date: _____ Hour Meter Reading: _____
Maintenance Performed By: _____

Every 2000 Hours

- ☐ Drain tandem oil
- ☐ Grease tandem pivots
- ☐ Drain circle gearbox oil

Comments: _____

Date: _____ Hour Meter Reading: _____
Maintenance Performed By: _____

03T;50 K130 060189

1T4;0050 05 090189

Periodic Maintenance—As Required

CHECK BATTERY ELECTROLYTE LEVEL AND TERMINALS

CAUTION: Battery gas can explode. Keep sparks snd flames away from batteriea. Uae a flashlight to check battery electrolyte level.

Never check battery charge by placing a metal object across the posts. Use a voltmeter or hydrometer.

Always remove grounded (-) battery clamp first and replace it last.

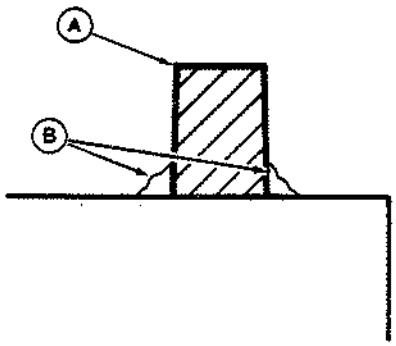
1. Remove battery cover.

IMPORTANT: Add water to batteries in freezing wether before you begin operating your machine for the day, or else charge the batteries.

2. Fill each cell to bottom of filler tube with distilled water.

CAUTION: Alwaya remove grounded (—) battery clamp first and replace it last.

3. Disconnect battery clamps, grounded clamp first.
4. Clean battery terminal (A) and clamps with a stiff brush.
5. Apply petroleum jelly (B) around battery terminal posts.
6. Install and tighten clamps, grounded clamp last.



018;T6758A A 03T;55 M75. 121288

CHECK AIR CLEANER

When the engine air filter light comes on, clean or replace air filter elements. Tighten all hose clamps. (To change elements, see Change Air Cleaner Elements in the Maintenance Chapter. To clean elements, see Clean Dusty Primary Element in the Maintenance Chapter.)

018;T6201BE 03T;55 M76. 121288

CHECK AIR INLET COVER

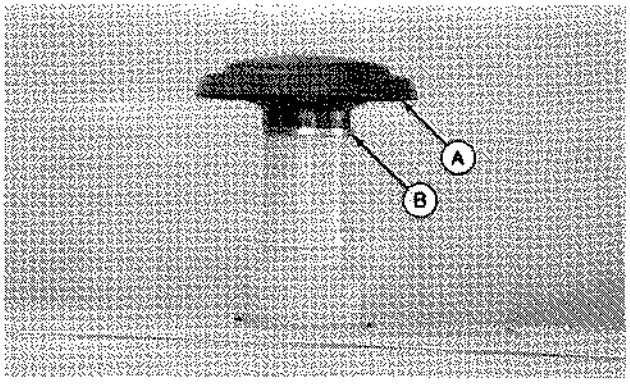
1. Loosen clamp and slide strap (B) down stack.

2. Remove air inlet cover (A).

CAUTION: Reduce compressed air to less than 30 psi (210 kPa) (2 bar) when using for cleaning purposes. Clear area of bystanders, guard against flying chips, and wear personal protection equipment including eye protection.

3. Clean cover with compressed air or soapy water. Dry cover.

4. Install cover on stack. Tighten clamp.



91A;T6162AX 03T;55 M77. 221188

INSPECT BELT, CHECK AND ADJUST TENSION

1. Check belt regularly for wear. Replace if necessary.

2. Check belt tension of belt closest to fan midway between pulleys..

SPECIFICATION

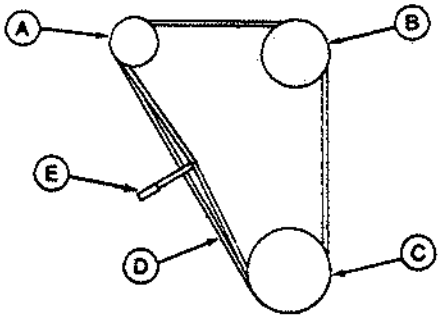
Force: 20 lb (90 N) ..... Deflection: 3/4 in. (19 mm)

3. If deflection is not within specifications, loosen alternator mounting cap screws.

4. Apply force to FRONT alternator housing only (near the belt) until tension is correct.

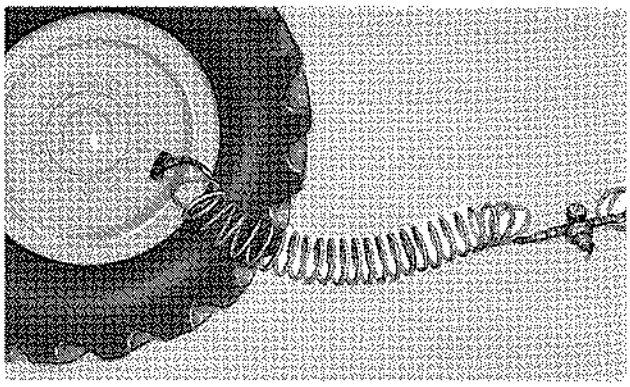
5. Tighten cap screws to 20 lb-ft (27 N·m).

A—Alternator Pulley
B—Fan Pulley
C—Crankshaft Pulley
D—Straight Edge
E—Belt Deflection Gauge



018;T6030AT4, T6231AL 03T;55 M78. 221188

CHECK TIRE PRESSURE



CAUTION: Explosive separation of a tire and rim parts can cause serious injury or death.

Do not attempt to mount a tire unless you have the proper equipment and experience to perform the job. Have it done by your John Deere dealer or a qualified repair service.

Always maintain the correct tire pressure. Do not inflate the tires above the recommended pressure.

When inflating tires, use a clip-on chuck and extension hose long enough to allow you to stand to one side and NOT in front of or over the tire assembly. Use a safety cage if available.

Inspect tires and wheels daily. Do not operate with low pressure, cuts, bubbles, damaged rims or missing lug bolts and nuts.

IMPORTANT: Tires are shipped from the factory at 50 ± 5 psi (344 ± 35) (3.4 ± 0.35) for shipping purposes. Adjust pressure before machine is put to work.

Check tire pressure with an accurate gauge having 1 psi (7 kPa) (0.1 bar) graduations.

The side shift cylinder must be extended slightly to raise machine to change a tire on a tandem.

1. Shut off air supply to hose.

2. Move gauge hand to correct pressure.

3. Lock air chuck on tire valve.

4. Turn on air supply. Stand to front or rear of tire when adding air.

5. After tire is at correct pressure, shut off air supply. Release chuck.

6. Inspect tire for damage.

NOTE: You may change tire pressures to suit working condition according to tire manufacturer's recommendations.

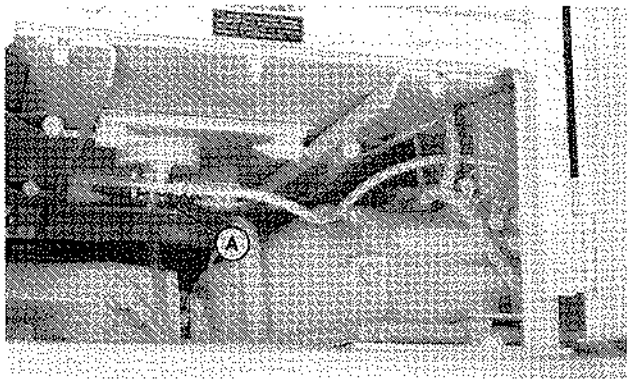
Tire Size	Type	Ply Rating	Cold Tire Inflation Pressure Psi	kPa	Bar
13.0 x 24		8	25 ± 1*	172 ± 7	1.8 ± 0.07
13.0 x 24	G2	10	30 ± 1*	207 ± 7	2.1 ± 0.07
13.0 x 24	G2	12	35 ± 1*	241 ± 7	2.4 ± 0.07
14.0 x 24	G2	10	30 ± 1*	207 ± 7	2.1 ± 0.07
14.0 x 24	G2	12	35 ± 1*	241 ± 7	2.4 ± 0.07
14.0 x 24**	XRAT	1 STAR	45 ± 1*	310 ± 7	3.1 ± 0.07
17.5 x 25	L2	12	30 ± 1*	207 ± 7	2.1 ± 0.07

**For sloping, ditching, and scarifying work, increase pressure to 45 psi (310 kPa) (3.1 bar)*
***Radial*

018;T6263AG 03T;55 K131. 110189

DRAIN FUEL TANK SUMP

1. Remove fuel tank filler cap.
2. Open fuel tank drain valve (A).
3. Drain water and sediment.
4. Close valve.
5. Install filler cap.



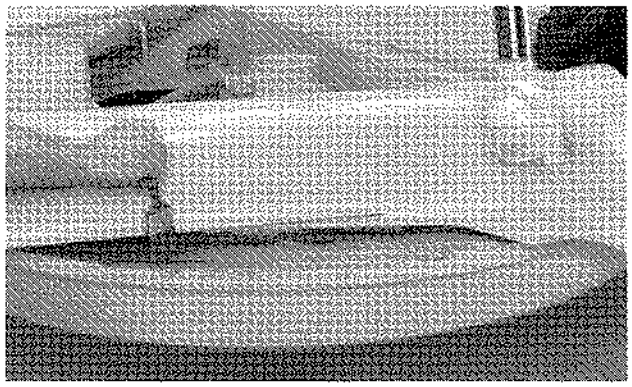
91A;T6180AD T82;55 C10 161285

LUBRICATE CIRCLE GEAR

Clean circle, if necessary.

Lubricate all contact areas on top and bottom of circle. Rotate circle in both directions.

(See Fuels and Lubricants chapter.)

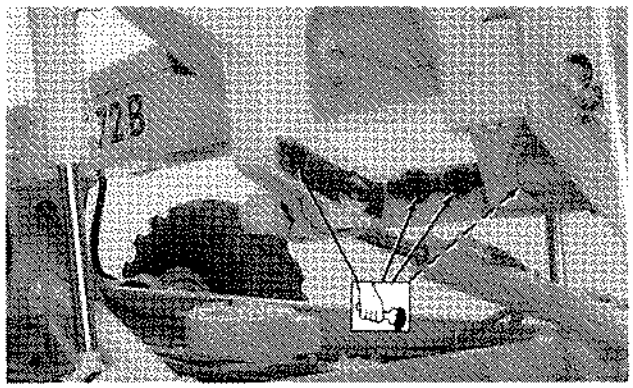


91A;T6164AB 03T;55 M81. 221188

LUBRICATE LIFT ARM LOCKING PIN HOLES

Lower blade to ground. Disengage locking pin from center hole. Apply grease from pin side of locking bar.

(See Fuels and Lubricants chapter.)



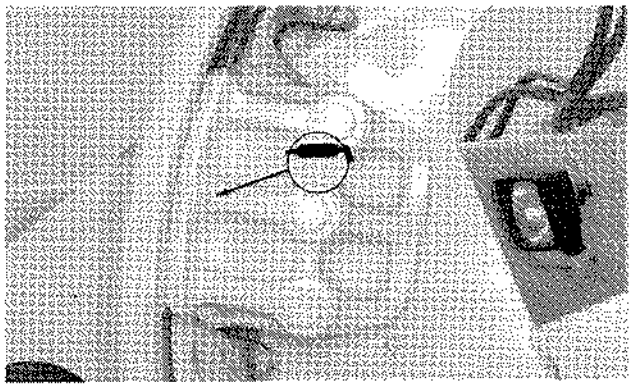
Seven Points—Left Side and Center Shown

91A;T6177AZ 03T;55 M82. 221188

LUBRICATE DRAFT FRAME CIRCLE SUPPORTS

Lubricate each point until grease escapes from joint.

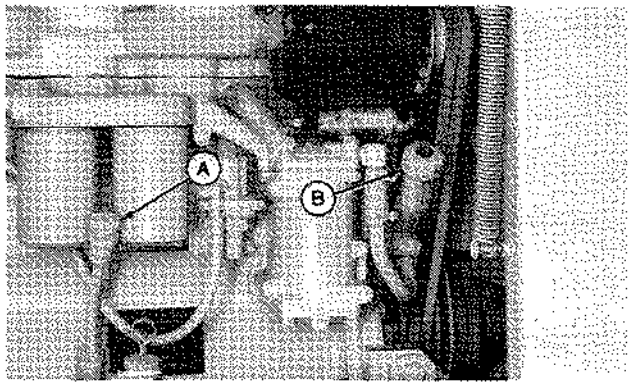
(See Fuels and Lubricants chapter.)



Four Points

91A;T6164CJ 03T;55 M83. 221188

CHECK ENGINE OIL LEVEL



IMPORTANT: If oil is below bottom marks on dipstick, do not run engine.

1. Park grader on a level surface.

2. Stop the engine.

3. Wait 10 minutes for oil to drain into oil pan.

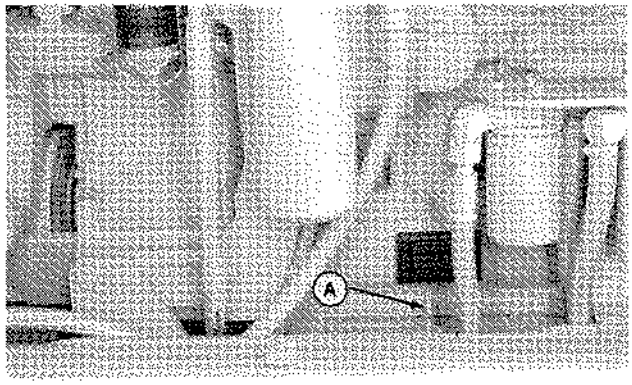
4. Check oil level on dipstick (A). Oil must be between marks.

5. If necessary, remove filler cap (B). Add oil. (See Fuels and Lubricants chapter for oil.)

6. Install filler cap.

91A;T6179AL4 T82;60 C1 070386

CHECK TRANSMISSION-HYDRAULIC OIL LEVEL



IMPORTANT: Do not start engine without oil in the transmission-hydraulic system.

1. Park grader on a level surface.

2. Lower equipment to the ground and roll blade back completely.

3. Wheels must be straight up. Front and back of machine must be aligned.

4. Stop the engine. Wait 10 minutes for oil to drain down.

5. Remove dipstick (A). Oil must be at or near upper mark.

6. If necessary, add oil. (See Fuels and Lubricants chapter.)

7. Install dipstick.

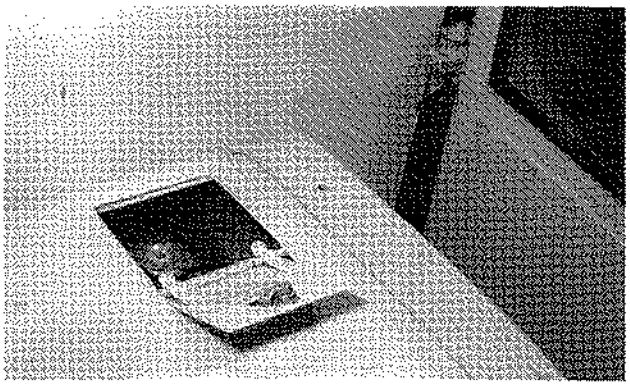
91A;T6177BE 03T;60 M81. 221188

CHECK RADIATOR COOLANT LEVEL

CAUTION: Do not remove radiator filler cap unless engine is cool. Loosen cap slowly to the stop. Release all pressure before removing cap.

1. Remove radiator filler cap. Coolant level must be 4.00 in. (100 mm) from bottom of filler neck. Add water or antifreeze as necessary.

2. Install filler cap.

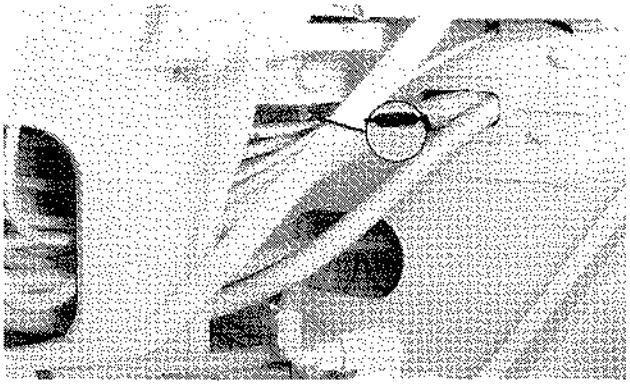


91A;T6969AB 03T;60 M82. 191288

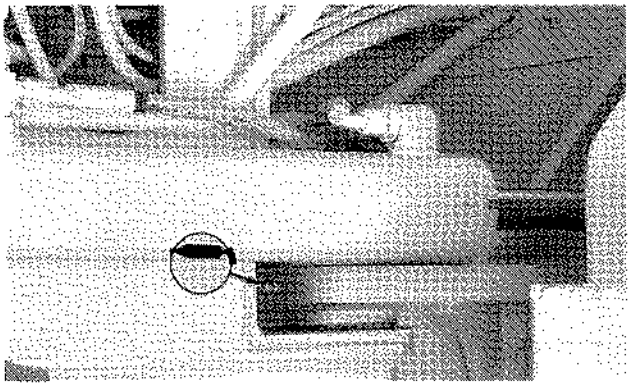
LUBRICATE FRAME HINGE PIVOTS

Lubricate each frame hinge pivot until grease escapes from joints.

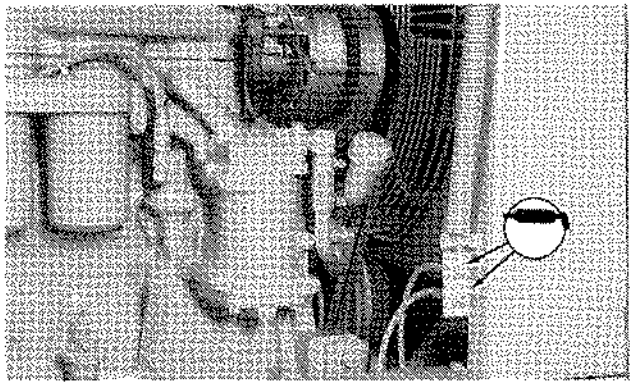
(See Fuels and Lubricants chapter.)



One Point—Upper Pivot



One Point—Lower Pivot
Earlier Units



Later Units

91A;T6181AQ, T6181AP, T6913AD5 03T;60 K120. 090189

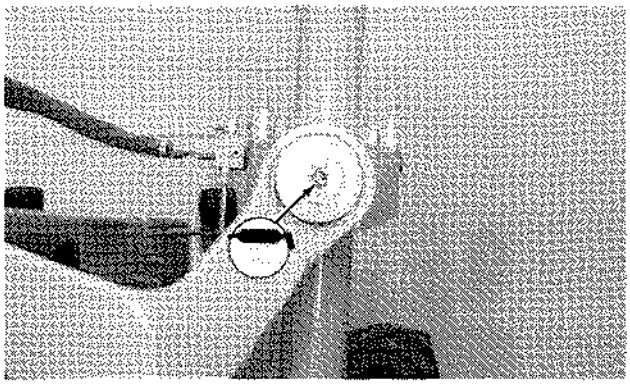
Periodic Maintenance—Every 50 Hours

LUBRICATE LIFT CYLINDER YOKE PIVOTS

Lubricate until grease escapes at joint.

(See Fuels and Lubricants chapter.)

Two Points—Right Side Shown



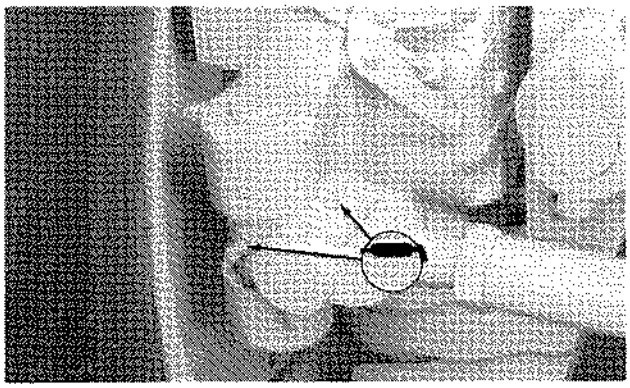
91A;T6163AB1 03T;65 M65. 221188

LUBRICATE TIE ROD ENDS

Lubricate until grease escapes at joint.

(See Fuels and lubricants chapter.)

Four Points—Left Side Shown



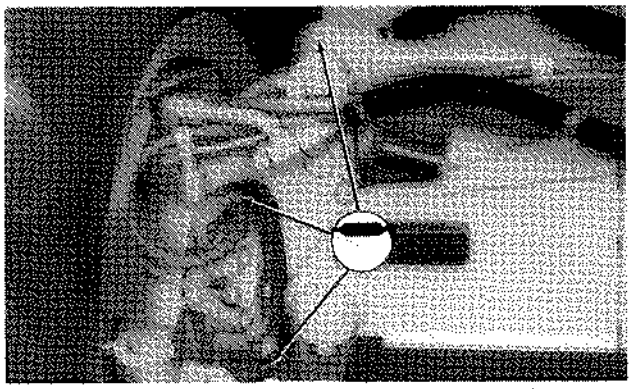
91A;T6163AD 03T;65 M66. 221188

LUBRICATE FRONT AXLE LEAN PIVOTS

Lubricate until grease escapes at joint.

(See Fuels and Lubricants chapter.)

Six Points—Left Side Shown



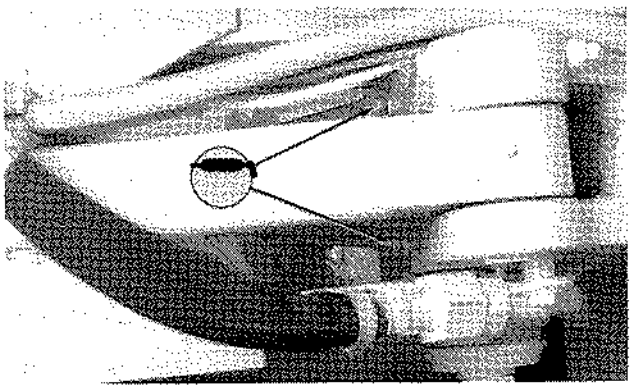
91A;T6164AW 03T;65 M67. 221188

LUBRICATE FRONT AXLE SPINDLES

Lubricate until grease escapes at joint.

(See Fuels and Lubricants chapter.)

Four Points—Right Side Shown

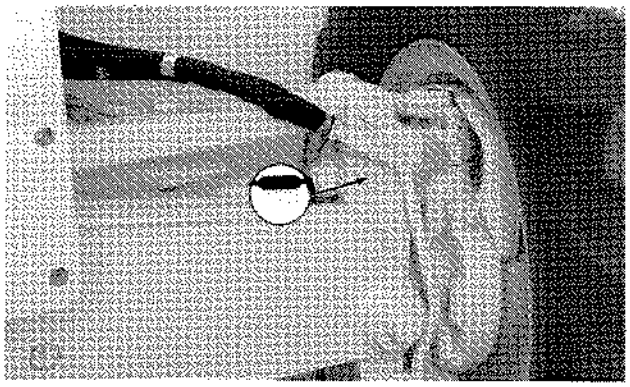


91A;T6164AU 03T;65 M68. 221188

LUBRICATE FRONT AXLE LEAN CYLINDER PIVOTS

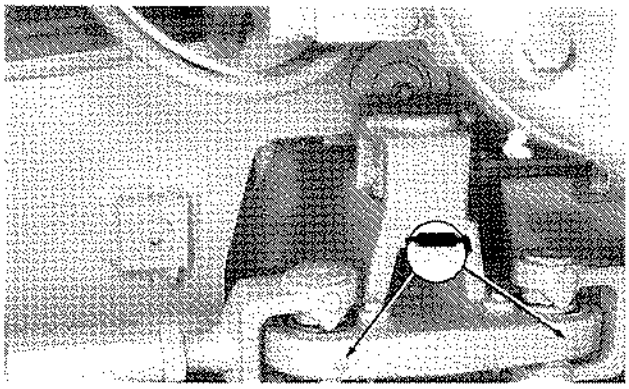
Lubricate until grease escapes at joint.

(See Fuels and Lubricants chapter.)

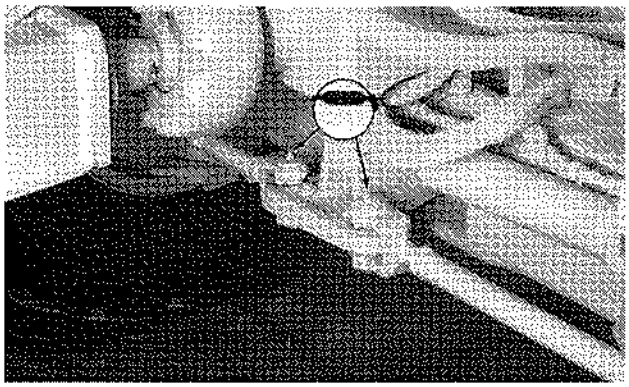


One Point

91A;T6164AV 03T;65 M69. 221188



Earlier Units
Two Points



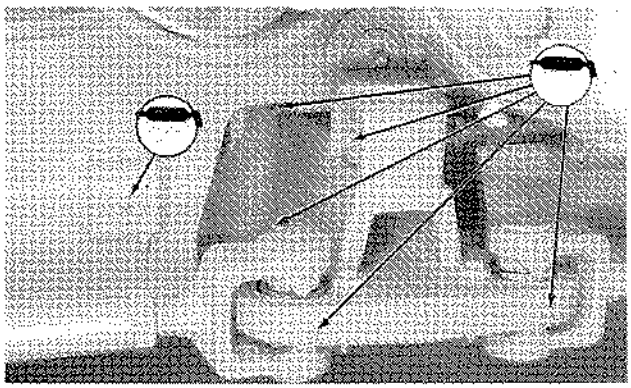
Later Units

91A;T6163AE1 T6913AB 03T;65 M70 221188

LUBRICATE STEERING YOKES AND CYLINDER PIVOTS

Lubricate until grease escapes at joints.

(See Fuels and Lubricants chapter for grease.)



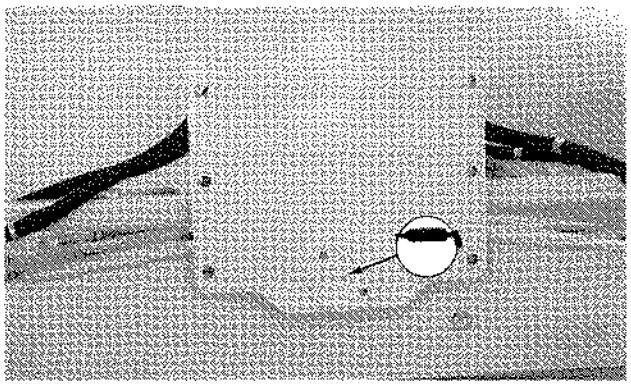
Six Points

91A;T6163AE 03T;65 M71. 221188

LUBRICATE FRONT AXLE PIVOT

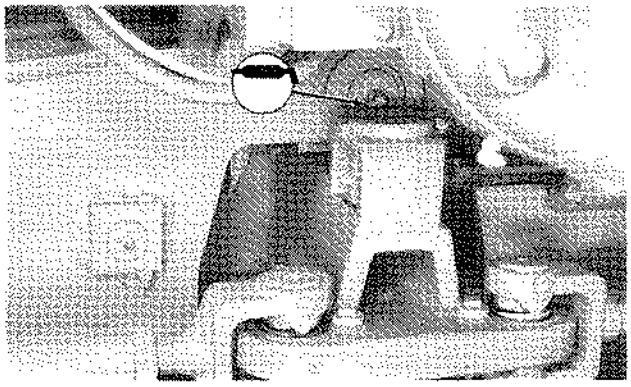
Lubricate until grease escapes at joint.

(See Fuels and Lubricants chapter.)



One Point

91A;T6164AT 03T;65 M72. 221188

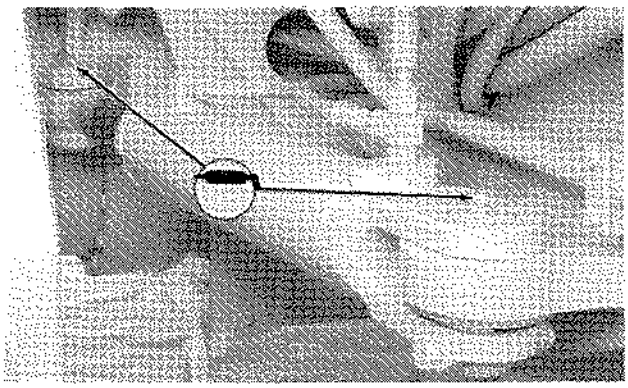


One Point

91A;T6163AE2 T82;65 C13 161285

LUBRICATE FRAME STEERING CYLINDER PIVOTS

Lubricate until grease escapes at joint. (See Fuels and Lubricants chapter.)



Four Points—Right Side Shown

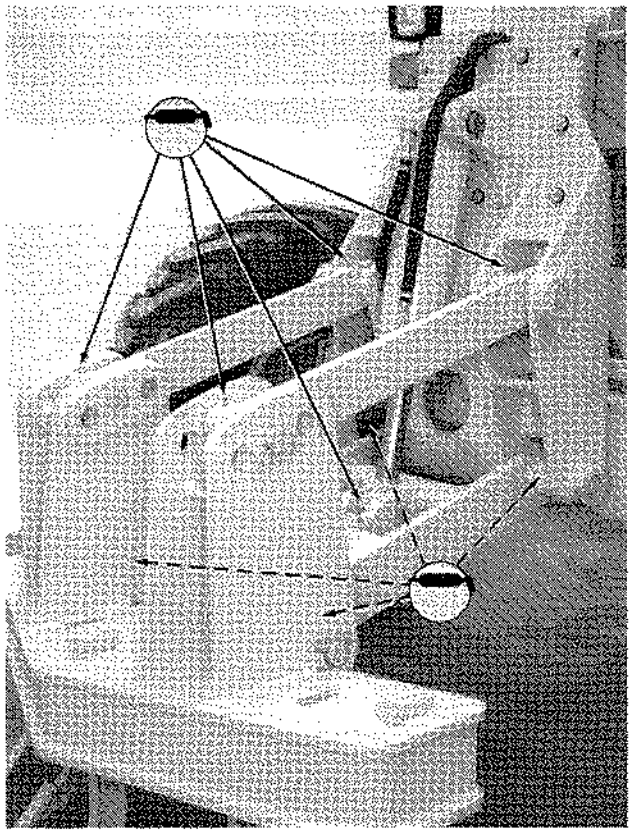
91A;T6163AC 03T;65 M73. 221188

LUBRICATE SCARIFIER—IF EQUIPPED

Lubricate until grease escapes at joint.

(See Fuels and Lubricants chapter.)

Nine Points



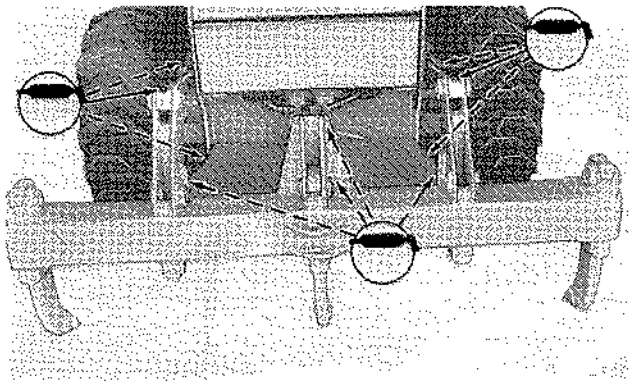
91A;T623BAX 03T;65 M74. 22118B

LUBRICATE RIPPER—IF EQUIPPED

Lubricate until grease escapes at joint.

(See Fuels and Lubricants chapter.)

10 Points

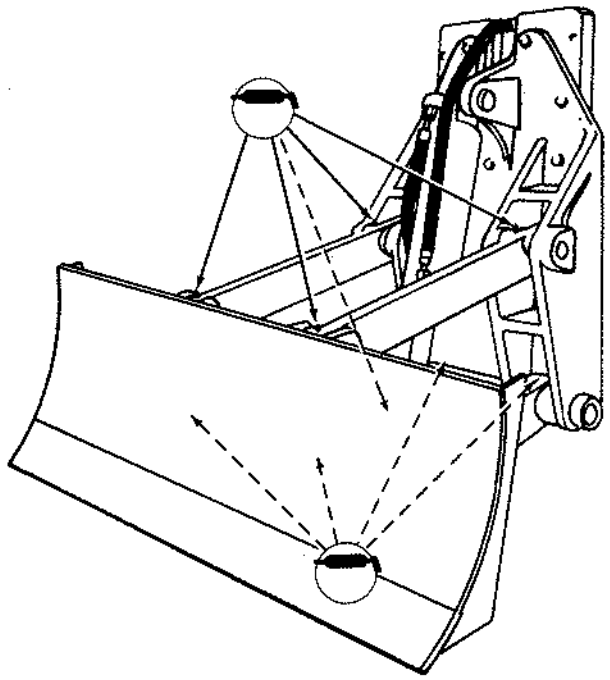


91A;T6235AF 03T;65 M75. 22118B

LUBRICATE BULLDOZER BLADE—IF EQUIPPED

Lubricate until grease escapes at joints.

(See Fuels and Lubricants chapter.)



Nine Points

91A;T6238AI1 03T;65 M76. 221188

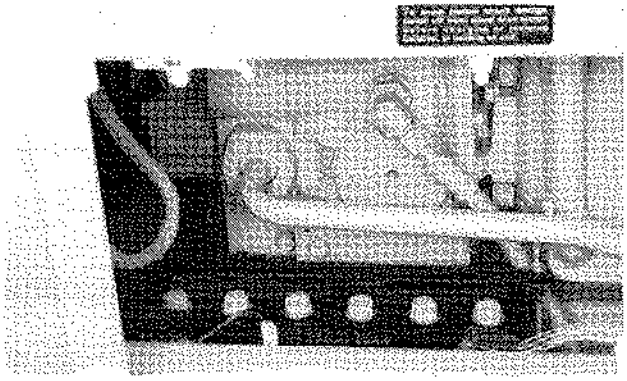
Periodic Maintenance—Every 250 Hours

CHECK BATTERY WATER LEVEL

CAUTION: Battery gas can explode. Keep sparks and flames away from batteries.

IMPORTANT: Add water to batteries in freezing weather before you begin operating your motor grader for the day, or else charge the batteries after filling.

Fill each cell to bottom of filler neck with distilled water.

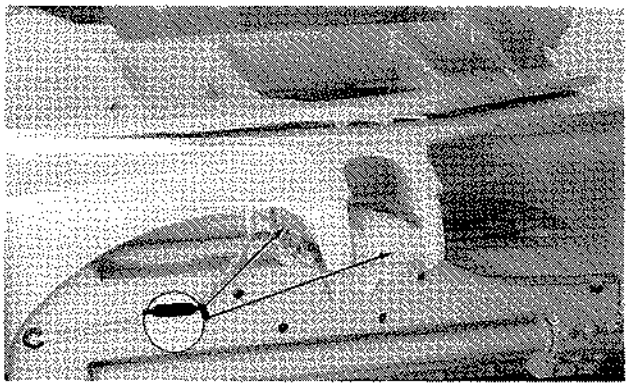


91A;T6180AB1 03T;75 K46. 060189

LUBRICATE BLADE PITCH CYLINDER PIVOTS

Lubricate until grease escapes at joints.

(See Fuels and Lubricants chapter.)

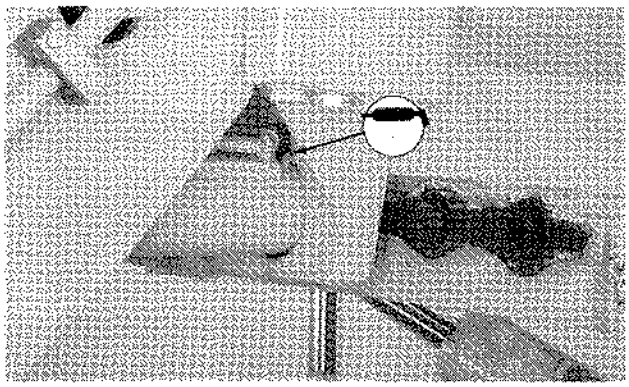


91A;T6164AQ 03T;75 M88. 221188

LUBRICATE LIFT ARM LOCKING PIN

Lubricate until grease escapes at joint.

(See Fuels and Lubricants chapter.)

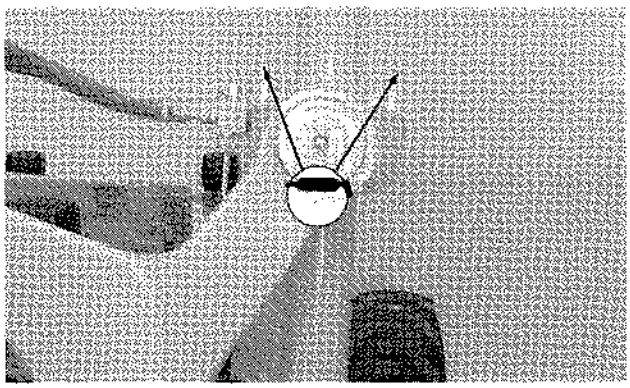


91A;T6177BA 03T;75 M89. 221188

LUBRICATE LIFT ARMS AND CYLINDERS

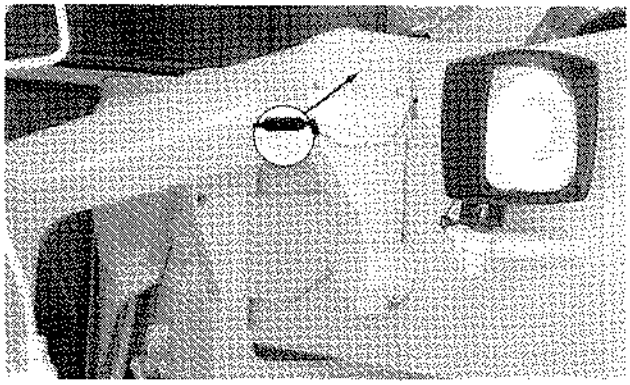
Lubricate until grease escapes at joints. There are a total of 14 points.

(See Fuels and Lubricants chapter.)



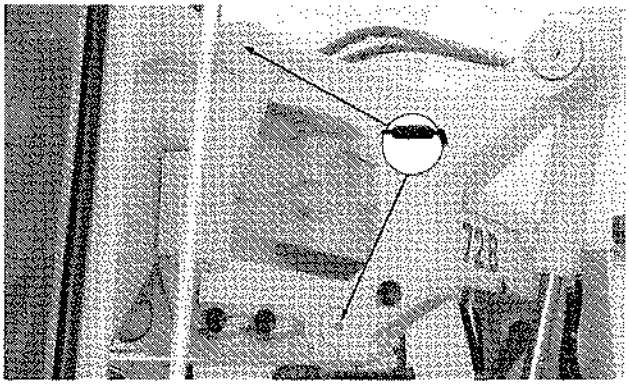
Four Points—Right Side Shown

91A;T6163AB 03T;75 M90. 221188



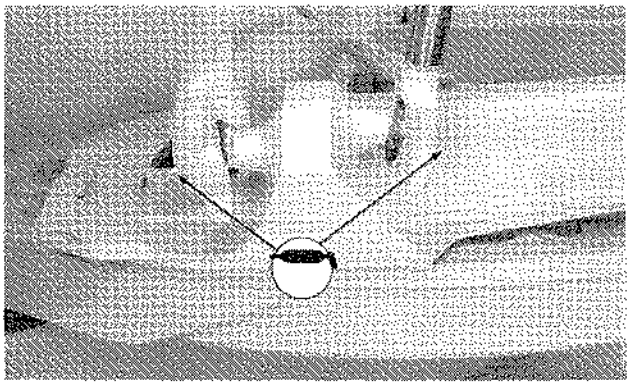
91A;T6164BP T82;75 C10 161285

Two Points—Right Side Shown



91A;T6164BE T82;75 C11 161285

Four Points—Right Side Shown



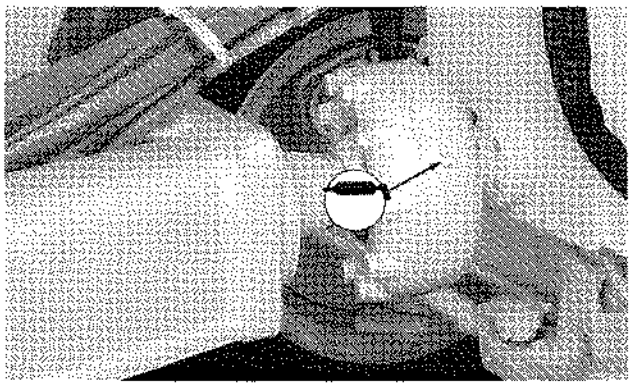
91A;T6164BF T82;75 C12 161285

Four Points—Right Side Shown

LUBRICATE DRAFT FRAME BALL

Lubricate until grease escapes from hole on opposite side of joint.

(See Fuels and Lubricants chapter.)



91A;T6164AR 03T;75 M91, 221188

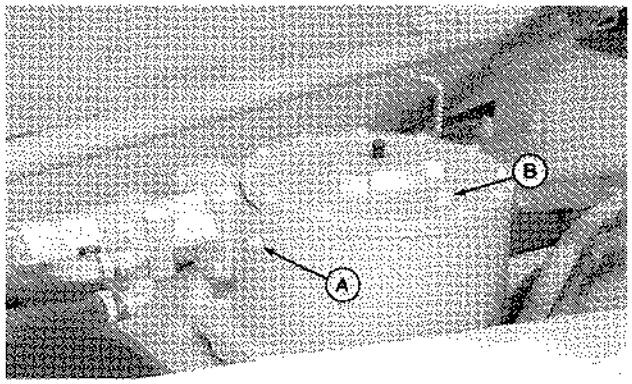
CHECK CIRCLE DRIVE GEARBOX OIL LEVEL

1. Park grader on level ground.

2. Level draft frame.

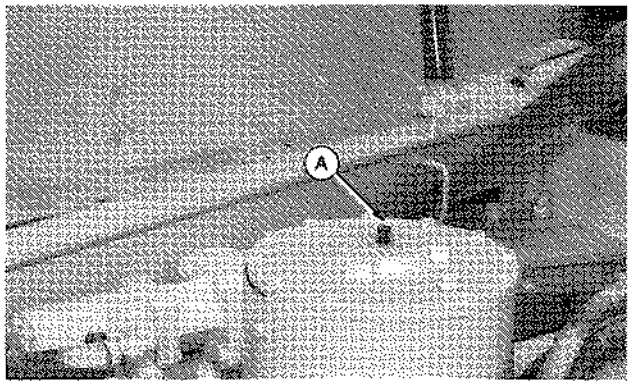
3. Remove plug (A). Oil must be to bottom of hole.

4. If necessary, remove filler plug (B). Add oil. (See Fuels and Lubricants chapter.) Install plugs.



91A;T6186AD T82;75 C14 060186

5. Turn cap (A) on top of breather tube to make sure cap moves freely. A plugged breather tube may cause leakage.



91A;T6186AD2 T82;75 C16 060186

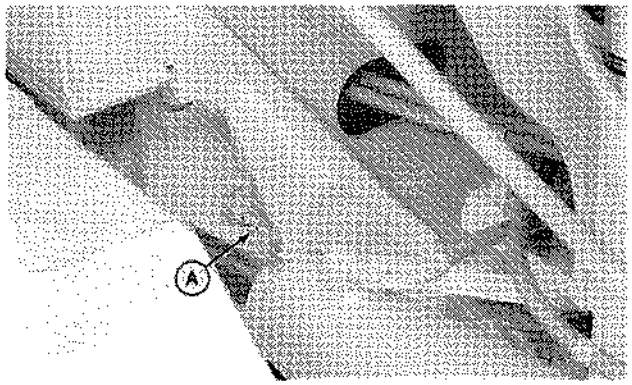
CHANGE ENGINE OIL AND FILTER

IMPORTANT: If fuel sulfur content exceeds 0.5 percent, the engine oil drain interval must be reduced by 50 percent to 125 hours.

NOTE: If engine has not run 250 hours before season changes, change oil.

1. Run engine to warm oil. Stop the engine.

2. Remove plug (A). Allow oil to drain.



91A;T6177BB 031;75 K47. 060189

3. Turn filters (A) counterclockwise to remove. Clean the mounting surfaces on base.

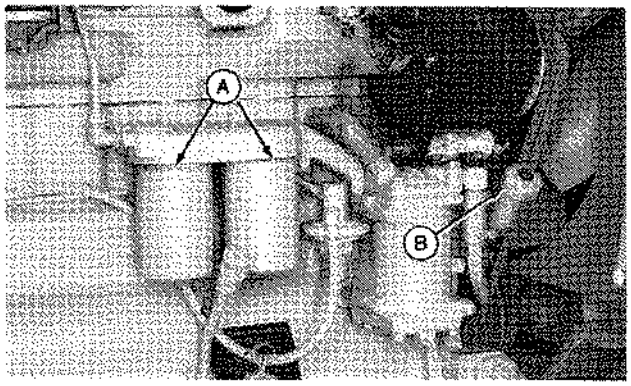
4. Apply thin film of oil to rubber gasket of new filters.

5. Install new filters. Turn filters clockwise by hand until gasket touches mounting surfaces.

6. Tighten 1/2—3/4 turn more.

7. Install drain plug.

8. Remove fill cap (B).



91A;T6179AK1 T82;75 C18 060186

SPECIFICATION

Engine oil capacity ..... 20 qt (19 L)

9. Fill engine with oil. See Fuels and Lubricants chapter.)

IMPORTANT: Before starting engine after a filter change, crank engine for 10 seconds without starting (fuel shut-off solenoid wire disconnected) to refill the filter elements and pre-lubricate turbocharger.

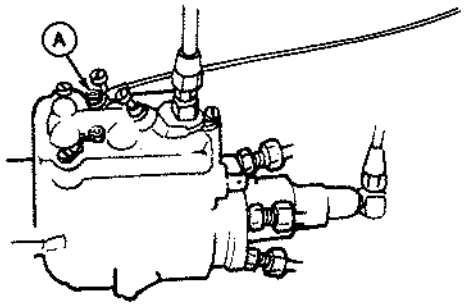
10. Disconnect fuel shut-off solenoid wire (A) on injection pump so engine will not start. Crank engine for 10 seconds using starting motor.

11. Install wire. Start and run engine at slow idle.

Check that engine oil pressure light on monitor goes out immediately. If not, stop engine immediately and find the cause.

Check for any leakage at filters. Tighten filters just enough to stop leakage.

12. Stop the engine. Check oil level.



018;T6191AC TB2;75 C19 110189

1F4;0075 04 100189

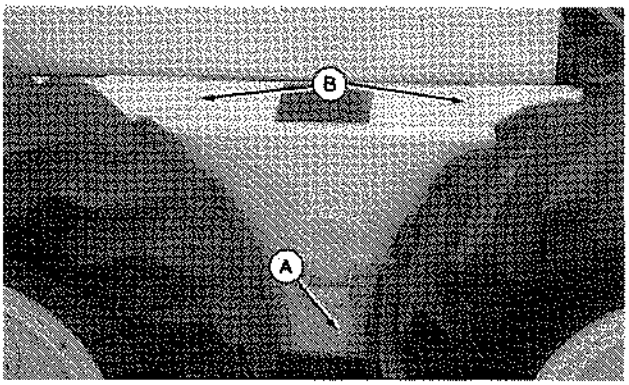
CHECK TANDEM OIL LEVEL

1. Park the grader on a level surface.

2. Remove oil level plug (A). Oil must be level or above plug hole.

3. If necessary, remove one of inspection plates (B) to add oil. (See Fuels and Lubricants chapter.)

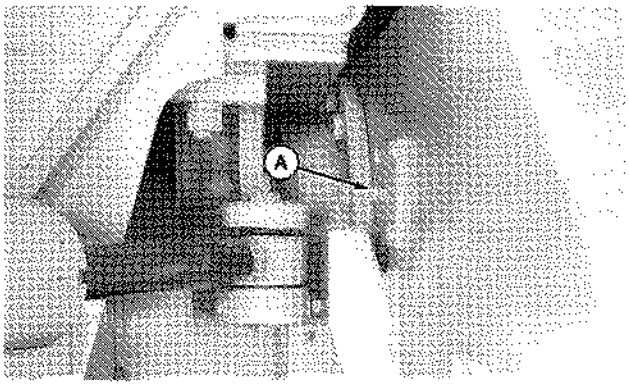
4. Install inspection plate and oil level plug.



91A;T6164AC 03T;80 M93, 121288

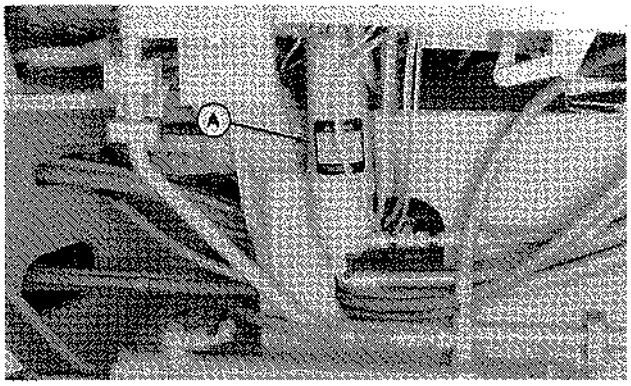
5. Turn cap (A) on top of breather tube to make sure cap moves freely. A plugged breather tube may cause leakage.

NOTE: Breather tube is at front of left tandem and at rear of right tandem.



91A;T6181AN1 T82;80 C10 171285

CHECK BRAKE ACCUMULATOR



1. Apply park brake.

2. Run engine for 1 minute to fully charge accumulator (A). Stop engine.

3. Turn key to BULB CHECK position and release (to "arm" the monitor). Brake pressure indicator must be off. Other indicator lights will be on, red stop light will flash, and alarm will sound.

4. Apply brake five times at 5 second intervals. Brake pressure indicator must not come on before three applications and pedal should feel firm for five applications.

IMPORTANT: If brake pressure indicator comes on before three applications or pedal feels "soft" before five applications:

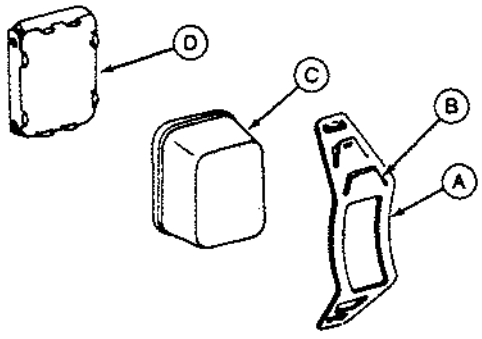
- **There is a hydraulic leak in the brake system.**
- **There is air in the brake system.**
- **The nitrogen gas precharge in the accumulator (A) is too low.**

Do not operate the machine until the problem is repaired. (See your John Deere dealer.)

5. Continue to apply brakes until brake pressure light is on. If pedal feels "soft" before brake pressure light is on, do not operate the machine until low brake pressure indicator is repaired. (See your John Deere dealer.)

91A;T6164AX 03T;80 M94, 060189

CHANGE FUEL FILTER



1. Remove retainer spring (A) to remove filter (C). Push on outer tab (B) while pulling up on center tab to disengage inner tab from notch in filter base (D).

2. Clean filter base.

3. Install new filter and retainer spring.

018;T6201AQ2 T82;80 C13, 171287

4. Check drain screw (C) to be sure it is tight.

5. Loosen bleed screw (A).

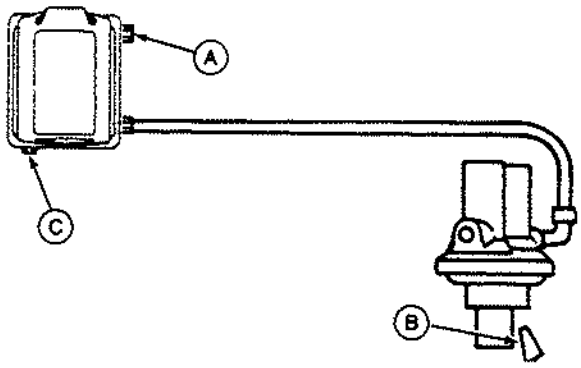
CAUTION: This filter must not be pressurized over 30 psi as glass may shatter.

6. Operate primer lever (B) until fuel flow from bleed screw is free of bubbles.

NOTE: If there is no fuel flow, push primer lever toward engine. Turn crankshaft using starter motor to reposition camshaft. Repeat Step 6.

7. Tighten bleed screw.

8. Push primer lever toward engine as far as possible.



018;T6201A02 T82;80 C14 310588

CHANGE TRANSMISSION OIL FILTER

1. Remove cap screw (A) and filter cover (B).

2. Remove packing (C) and element (D).

3. Clean the inside of the filter cover.

4. Install new element inside cover.

5. Place packing on transmission housing.

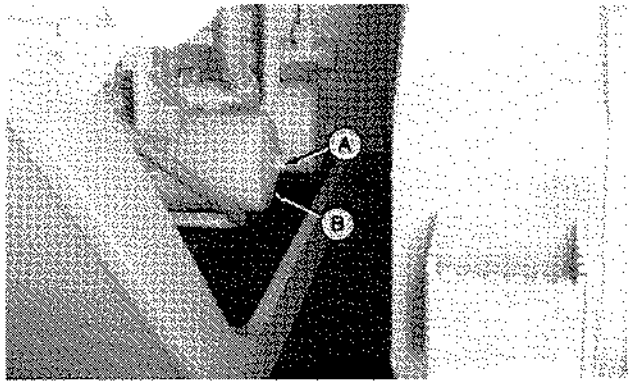
6. Install cover and cap screw.

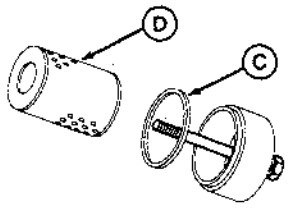
7. Add approximately 2 qt (1.9 L) oil. (See Fuels and Lubricants chapter.)

8. Start engine. Check for leaks around filter. Tighten filter only enough to stop leaks.

9. Stop engine. Check oil level.

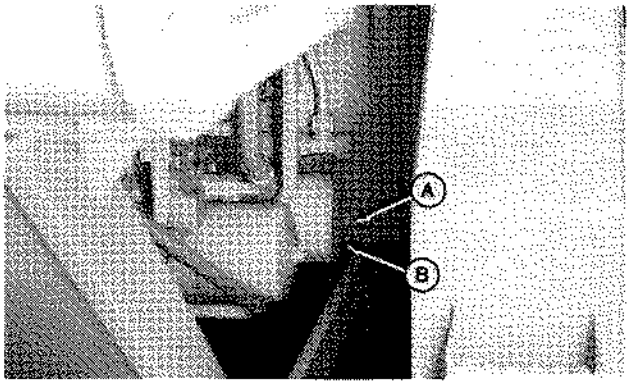
NOTE: Changing transmission oil filter will not drain oil from case. If oil flows from case, filter bypass is stuck open; see your John Deere dealer.



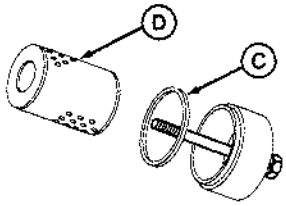


91A;T6220BB, 018;T6230AN 03T;80 K101. 130189

CHANGE HYDRAULIC RETURN OIL FILTER



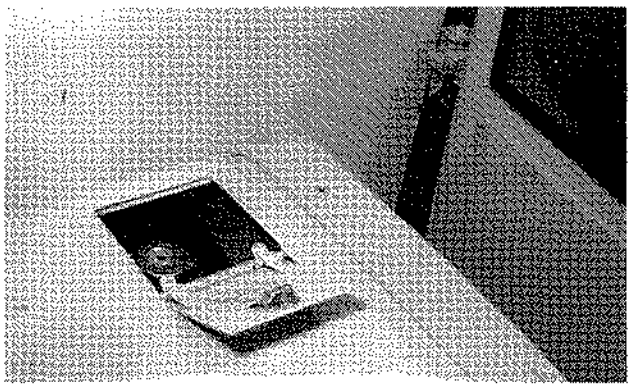
1. Remove cap screw (A) and filter cover (B).
2. Remove packing (C) and element (D).
3. Clean the inside of the filter cover.
4. Install new element inside cover.
5. Place packing on hydraulic housing.
6. Install cover and cap screw.
7. Add approximately 2 qt (1.9 L) oil. (See Fuels and Lubricants chapter.)
8. Start engine. Check for leaks around filter. Tighten filter only enough to stop leaks.
9. Stop engine. Check oil level.



NOTE: Changing hydraulic return oil filter will not drain oil from case. If oil flows from case, filter bypass is stuck open; see your John Deere dealer.

91A;T6220BBi, 018;T6230AN 03T;80 K102. 060189

ADD COOLANT CONDITIONER TO RADIATOR



CAUTION: DO NOT remove the radiator filler cap unless the engine is cool. Then loosen cap slowly to the stop. Release all pressure before removing.

Add 3/4 qt (3/4 L) RE12842 John Deere Coolant Conditioner or equivalent.

NOTE: Add conditioner every 500 hours or six months, or if you replace one-third or more of coolant.

91A;T6969AB 03T;80 M97. 191288

Periodic Maintenance—Every 1000 Hours

CLEAN THE ENGINE CRANKCASE VENTILATION TUBE

Clean the tube when you measure and adjust engine valve clearance (lash).

03T;85 K132. 060189

ADJUST ENGINE VALVE CLEARANCE (LASH)

1. Disconnect battery ground.

2. Remove muffler, precleaner, both side shields, and hood.

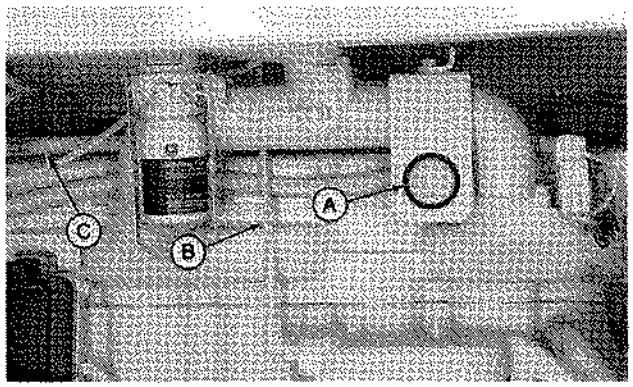
3. Disconnect two engine harness wires from alternator.

03T;85 K133. 060189

4. Unplug terminal to disconnect hour meter (A).

5. Remove turbocharger oil line (B).

6. Remove engine crankcase ventilation tube (C). Clean tube with solvent or diesel fuel.

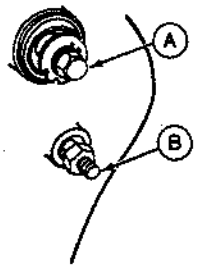


91A;T6179AJ T82;85 C21 060186

7. Remove rocker arm cover screws and remove cover.

8. Install JDE-81-4 Timing Pin (B) and JDE-81-1 Flywheel Turning Tool (A).

9. Turn flywheel until timing pin goes into hole in flywheel.



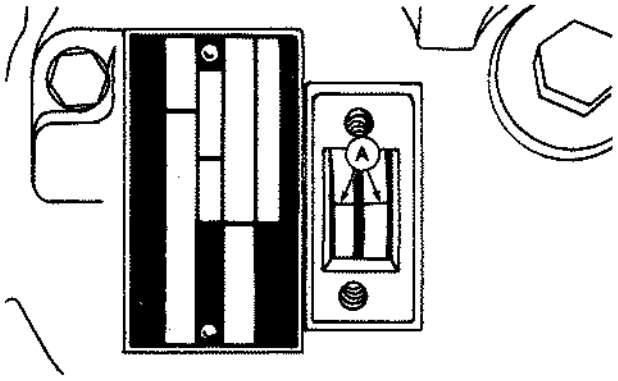
018;T6129AJ T82;85 C22 060186

1T4;D085 01 100189

10. Use either of the following methods to determine which cylinder is at top dead center (TDC):

Try to move both push rods at number one cylinder. If both push rods are loose, number one piston is at TDC on compression stroke. If both push rods are not loose, number six piston is at TDC on compression stroke.

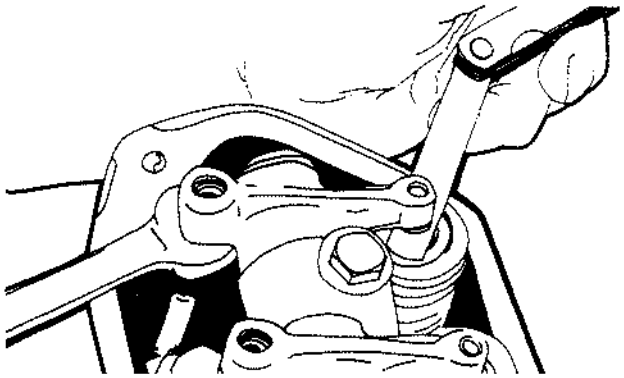
Remove timing hole cover from fuel injection pump. If the timing lines (A) are in alignment, then the number one piston is at TDC on the compression stroke. If the lines are not in alignment, the number six piston is at TDC on the compression stroke.



018;T6104AA T82;85 C23 080186

11. Measure and adjust valve clearance, first with number one piston at TDC and then with number six at TDC. To change piston position, pull timing pin out of flywheel, rotate flywheel 360°, and insert timing pin.

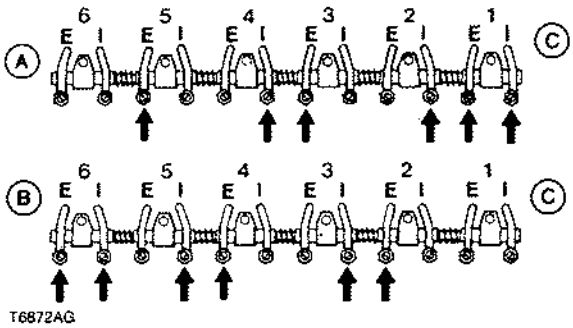
NOTE: Valve clearance can be adjusted whether engine is hot or cold.



018;T6119AI T82;85 C24 160186

VALVE CLEARANCE SPECIFICATIONS

Intake Valves (I)	0.014 in. (0.36 mm)
Exhaust Valve (E)	0.018 in. (0.46 mm)



T6872AG

A—No. 1 TDC Compression Stroke

B—No. 1 TDC Exhaust Stroke

C—Fan End of Engine

018;T6872AG T82;85 C25 110189

12. Clean cylinder head and rocker arm cover mating surfaces.

13. Install rocker arm cover gasket. Do not use sealant on the gasket.

14. Install rocker arm cover. Tighten screws to 96 lb-in (10.8 N·m).

T82;85 C27 060186

15. Install engine crankcase ventilation tube and turbocharger oil line.

16. Reconnect hour meter.

17. Connect two engine harness wires to alternator.

18. Install hood, side shields, precleaner and muffler.

19. Connect battery ground on each battery.

T82;85 C28 060186

ENGINE SPEEDS

1. Warm engine to normal operating temperature.

2. Connect a tachometer to check engine speeds.

Slow idle ..... 900 ± 25 rpm
Fast idle ..... 2500 ± 25 rpm

If engine speeds need adjustment, see your John Deere dealer.

03T;85 K134. 060189

ADJUST ENGINE SPEED LINKAGE

Examine linkage for binding, worn bushings, and bent parts.

PEDAL SLOW IDLE ADJUSTMENT

1. Disconnect yoke (A) from injection pump lever (B).

2. Disconnect link (E) at mixer arm (F). Loosen fast idle stop screw jam nut (G) and turn stop screw in as far as possible (away from pedal).

3. Move speed control lever (H) to slow idle position. Hold pedal against slow idle rubber bumper (I) and adjust link (E) until hole in mixer arm (F) aligns with hole in ball joint. Lengthen link (E) by turning either ball joint one turn counterclockwise. Move speed control lever to half speed and install cap screw through ball joint into mixer arm and tighten. Move speed control lever to slow idle position. Pedal must be against rubber bumper.

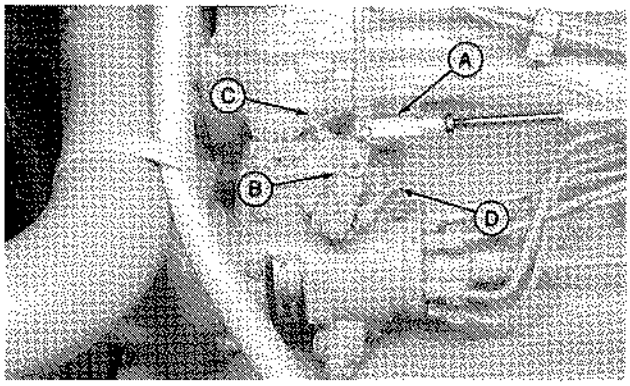
INJECTION PUMP YOKE ADJUSTMENT

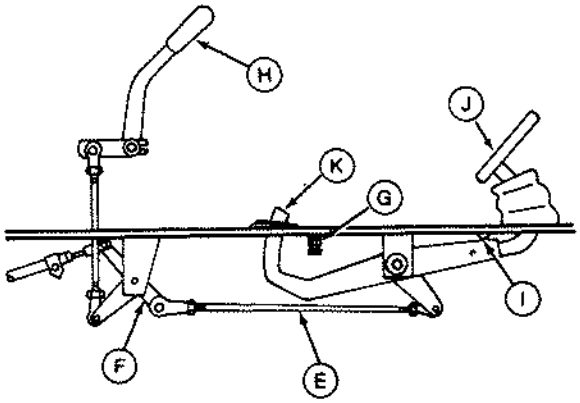
1. With hand lever in slow idle position and injection pump lever in the full up position against slow idle stop screw (C) (internal), adjust yoke (A) so yoke hole aligns with hole in injection pump lever (B).Install yoke pin and cotter pin.

2. Place the hand lever in the high idle position and tap accelerator (J) with foot. Injection pump lever must be against the injection pump fast idle screw (D).

PEDAL FAST IDLE ADJUSTMENT

1. With hand lever in fast idle position and injection pump lever against fast idle screw, adjust pedal fast idle stop screw (H) to have .060 in. (1.5 mm) clearance with top of pedal. Tighten jam nut.



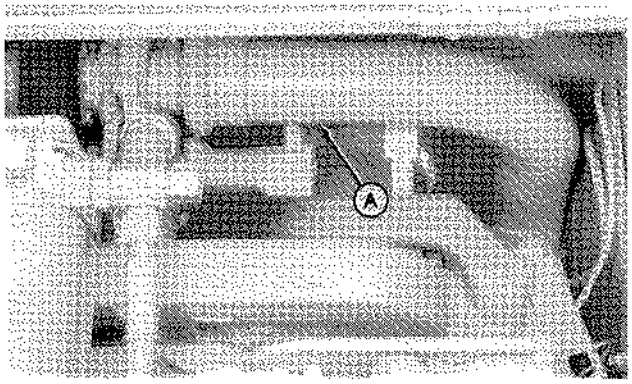


A—Yoke
B—Injection Pump Lever
C—Slow Idle Screw
D—Fast Idle Screw
E—Link
F—Mixer Arm
G—Fast Idle Stop Screw Jam Nut
H—Speed Control Lever
I—Rubber Bumper
J—Accelerator
K—Decelerator

CHECK AIR INTAKE HOSE

Check hose (A) for cracks.

Tighten clamps.



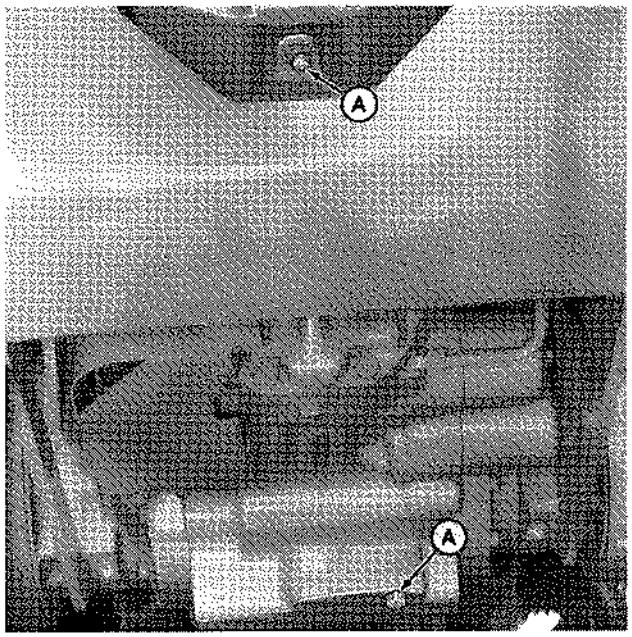
91A;T6177AE 03T;85 M108. 221188

CHANGE TRANSMISSION—HYDRAULIC OIL AND CLEAN TRANSMISSION PUMP INLET SCREEN

1. Operate hydraulic functions to warm hydraulic oil. Stop the engine.

2. Remove plugs (A) to drain oil.

3. While oil is draining, change transmission and hydraulic return oil filters. (See Periodic Maintenance/500 Hours chapter.)



91A;T6220BD T82;85 C43 171285

4. Remove plug (A) to drain oil from screen canister.

5. Loosen nut (B) to disconnect line (C).

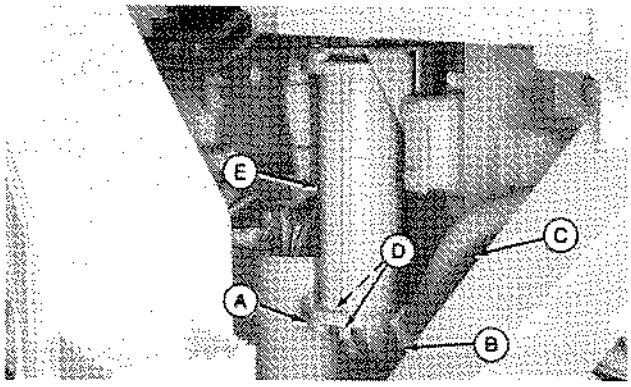
6. Remove two nuts (D) to remove canister (E).

7. Remove screen from canister and clean with solvent.

NOTE: When reassembling suction screen, install O-ring to bottom cover (if it was removed), assemble cannister to bottom cover, then attach cannister to upper mounting base.

8. Check O-ring inside base for scratches. Replace if necessary.

9. Install screen and canister. Connect line.



A—Drain Plug
B—Nut
C—Line
D—Two Nuts
E—Cannister

91A;T6221AA 03T;85 K136 060188

10. Install transmission case drain plugs.

11. Remove dipstick (A).

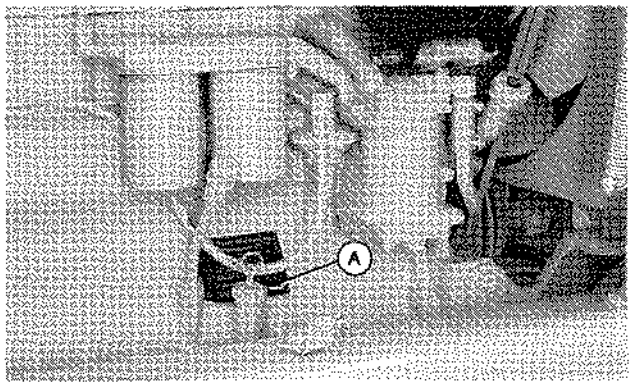
SPECIFICATION

Transmission oil capacity ..... 14 gal (53 L)

12. Fill transmission with oil. (See Fuels and Lubricants chapter.)

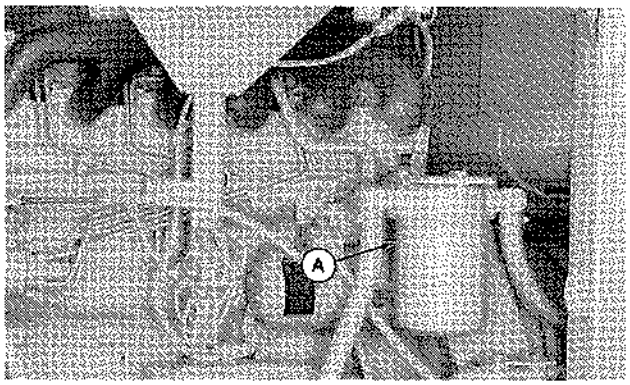
13. Run engine 1 minute. Stop engine.

14. Check oil level.



91A;T6179AK 03T;85 K137 060189

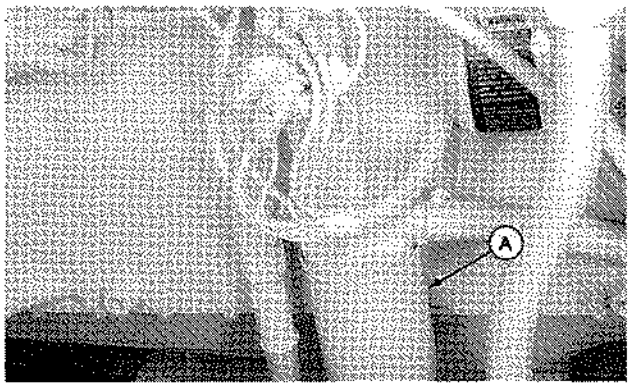
CHANGE HYDRAULIC FRONT WHEEL DRIVE PUMP RETURN FILTER—FRONT WHEEL DRIVE UNITS ONLY



1. Stop the engine.
2. Lower all equipment to the ground.
3. Turn filter (A) counterclockwise to remove.
4. Remove packing.
5. Clean the mounting base.
6. Apply a thin film of oil to new packing.
7. Install new filter. Turn filter clockwise by hand until packing touches mounting surface.
8. Tighten 1/2—3/4 turn more.
9. Start the engine. Operate hydraulic functions. Check for leaks. Tighten filter only enough to stop leak.

91A;T6179AG 03T;85 K138. 060189

CHANGE HYDRAULIC FRONT AXLE RETURN (MOTOR LEAKAGE) FILTER—FRONT WHEEL DRIVE UNITS ONLY



1. Stop the engine.
2. Lower all equipment to the ground.
3. Turn filter (A) counterclockwise to remove.
4. Clean the mounting surface.
5. Apply thin film of oil to gasket of new filter.

91A;T6179AF T82;85 C51 171285

1T4;0085 07 100189

6. Install new filter. Turn filter clockwise by hand until gasket touches mounting surface.

7. Tighten 1/2—3/4 turn more.

8. Start engine. Operate front wheel drive. Check for correct operation.

IMPORTANT: If front wheel drive surges, problem could be caused by loose return filter. To check for loose filter, squirt oil sround seal of filter. If oil is sucked in, filter is not tight.

NOTE: If oil leaks from left or right wheel case relief valve, shift from forward to reverse to remove possible foreign material in valve motor plate.

If this does not stop leak, check hoses from front wheels to axle return filter for restriction. If no restriction is found, problem could be excessive motor leakage within front wheels. See your John Deere dealer. Pressure built in front wheel case causes the relief valve to open.

T82;85 C53 060186

CHANGE WHEEL MOTOR OIL—FRONT WHEEL DRIVE UNITS ONLY

1. Raise the front wheels with the blade.

2. Rotate wheel so drain plug (A) is in six o'clock position.

3. Remove drain plug. Allow oil to drain.

NOTE: Change transmission and hydraulic oil at this time. (See Change Transmission And Hydraulic Oil in this chapter.)

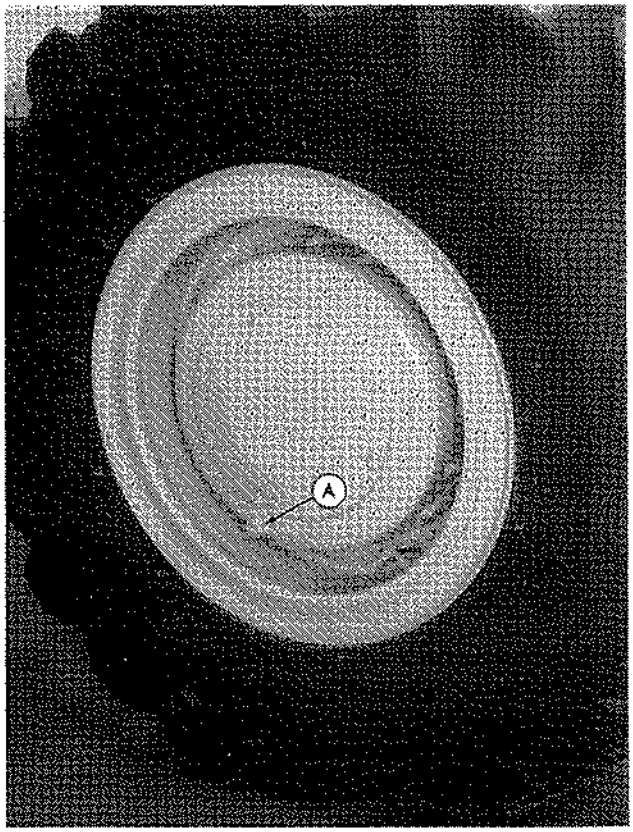
IMPORTANT: Do not start engine before you fill wheel motor with oil.

If you find metal filings in the oil, see your John Deere dealer.

4. Rotate wheel so drain plug is at twelve o'clock position.

5. Fill each wheel motor with 2 gal (7.6 L) of oil. (See Fuels and Lubricants chapter.)

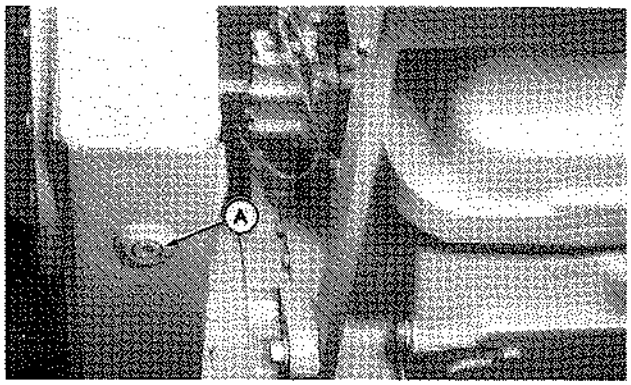
6. Install plug.



91A;T6164BM T82;85 C54 110189

1T4;0085 08 100189

CHANGE TANDEM OIL



1. Park grader on level ground.

2. Remove drain plug (A) from front of right housing, rear of left housing.

3. Flush each housing with diesel fuel. Install drain plugs.

SPECIFICATION

Tandem oil capacity	5 gal (19 L)

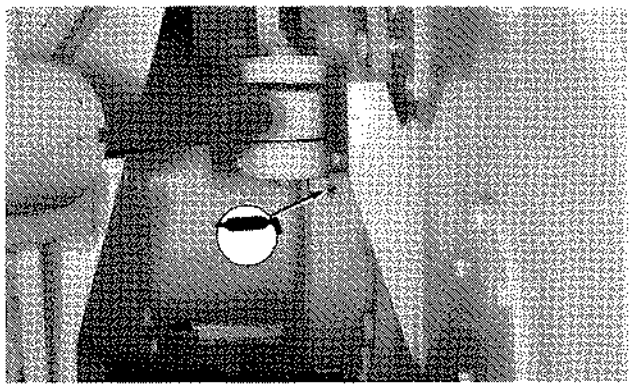
4. Add oil until flush or above check plug hole of each housing. (See Fuels and Lubricants chapter.)

91A;T6164AE 031;8; M89. 191288

LUBRICATE TANDEM PIVOTS

Lubricate until grease escapes at pivot.

(See Fuels and Lubricants chapter.)



Left Side Shown

91A;T6181AN T82;86 C2 060186

CHANGE CIRCLE GEARBOX OIL

1. Park the grader on level ground. Draft frame must be level.

2. Remove drain plug (A) and fill plug (B).

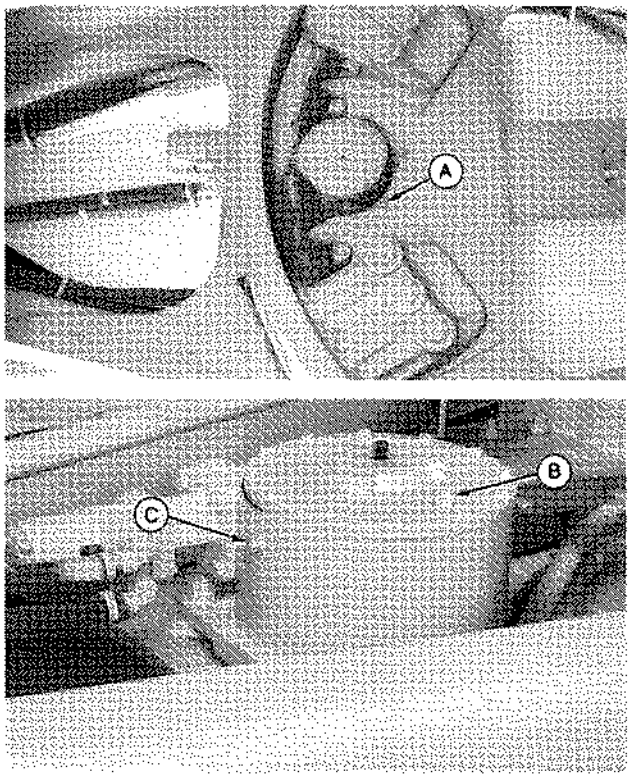
3. Allow oil to drain. Install drain plug.

SPECIFICATION

Gearbox oil capacity	3 qt (2.8 L)

4. Remove check plug (C). Add oil (see Fuels and Lubricants chapter). Oil must be level with bottom of check plug hole.

5. Install fill plug and check plug.



91A;T6186AC2, T6186AD1 03T;86 K27. 110189

DO NOT SERVICE INJECTION NOZZLES

IMPORTANT: Do not service or remove injection nozzles. The service life of the injection nozzles may be shortened by:

Overheating Improper operation
Poor quality fuel Excessive idling

If injection nozzles are not working correctly or are dirty, the engine will not run normally. (See your John Deere dealer for service.)

04T;90 K236. 171188

DO NOT CHANGE INJECTION PUMP

IMPORTANT: Never steam clean or pour cold water on an injection pump while the pump is running, or while it is still warm. To do so may cause seizure of pump parts.

Clean trash regularly from under injection pump.

Changing the injection pump in any way not approved by the manufacturer will end the warranty. (See your copy of the John Deere warranty on this machine.)

Do not service an injection pump that is not operating correctly. (See your authorized injection pump service center.)

04T;90 K237. 171188

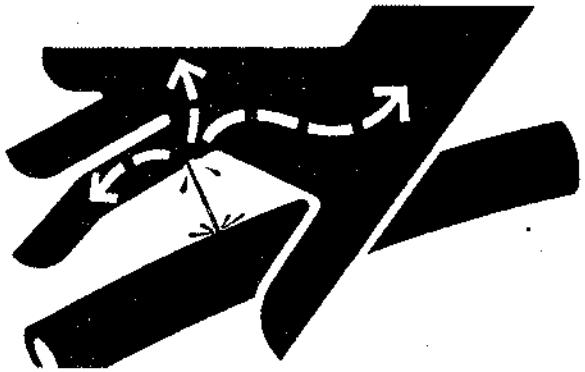
DO NOT SERVICE CONTROL VALVES, CYLINDERS, PUMPS OR MOTORS

Special tools and information are needed to service control valves, cylinders, pumps, or motors.

If these parts need service, see your John Deere dealer.

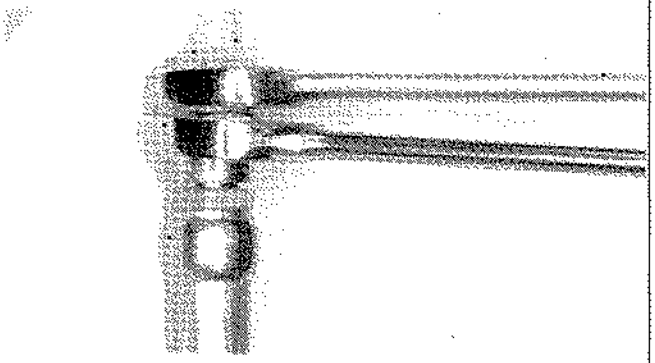
T82;EXMA BJ. 230387

CHECK OIL LINES AND FITTINGS



CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Relieve pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Keep hands and body away from pinholes and nozzles which eject fluids under high pressure. Use a piece of cardboard or paper to search for leaks. DO NOT use your hand.

If ANY fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type injury or gangrene may result.



Check all oil lines, hoses and fittings regularly for leaks or damage. Make sure all clamps are in position and tight. Make sure hoses are not twisted or touching machine parts which are moving.

Tubing with dents may cause the oil to overheat. If you find tubing with dents, install new tubing immediately.

IMPORTANT: Tighten fittings as specified in torque chart.

When you tighten connections, use two wrenches to prevent bending or breaking tubing and fittings.

018;X9811, T85401 04T;90 K239, 171188

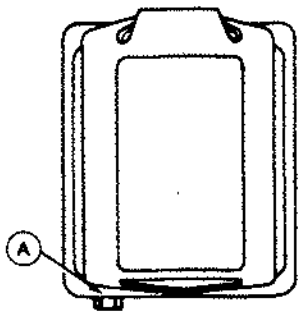
DRAIN FUEL FILTER SEDIMENT

Drain water and sediment as necessary.

1. Loosen drain screw (A). Drain fuel for several seconds.

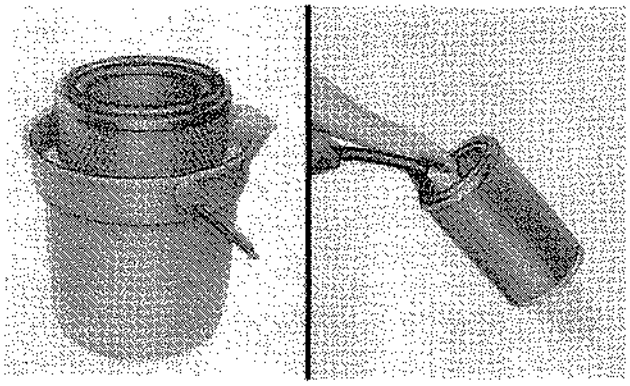
2. Tighten drain screw.

3. Bleed fuel system. (See Change Fuel Filter in Periodic Maintenance/500 Hours chapter.)



018;T6201AM2 TB2;90 C1, 090987

CLEAN OILY OR SOOTY PRIMARY ELEMENT



IMPORTANT: OO NOT waah element in fuel oil, oil, gasoline, or solvent. DO NOT use compressed air to remove water from element.

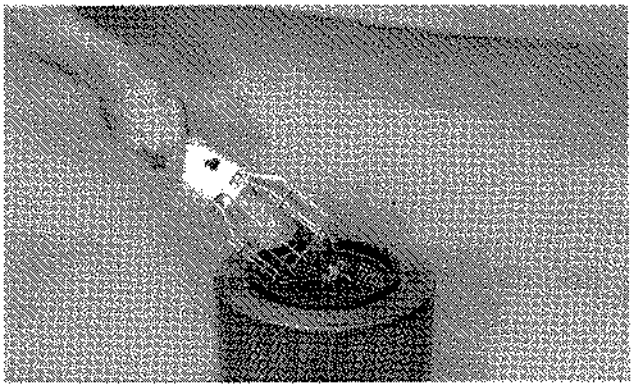
1. Wash element in warm water and John Deere R36757 Filter Element Cleaner or equivalent non-sudsing detergent.

2. Flush with clean water. Use water pressure under 40 psi (280 kPa) (2.8 bar).

3. Shake the element to remove water. Do not install element unless it is dry.

018;T90673 04T;90 K240. 171188

INSPECT ELEMENT



IMPORTANT: Install a new primary element:
1. **If the element shows damage.**
2. **If element will not clean.**
3. **After 1000 hours service or annually.**

Install a new secondary element:
1. **If the primary element is damaged and needs to be replaced.**
2. **If the element is visibly dirty.**
3. **After 1000 hours service or annually.**

Oo not clean a secondary element. Install a new element carefully centering it In the canister.

1. Inspect element and gasket for damage.

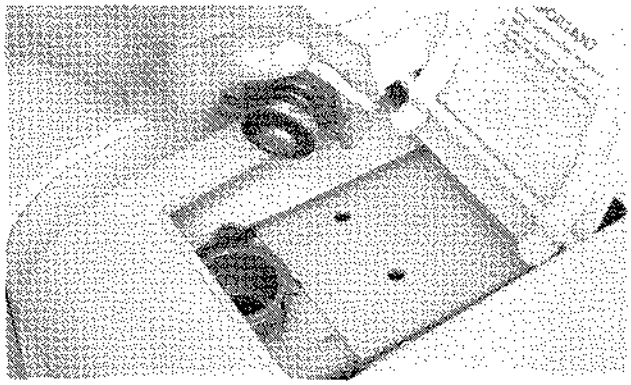
2. Air restriction indicator will not signal correctly if an element has a break or is not correctly sealed in air cleaner housing. Throw away element that has the slightest damage. If gasket is broken or missing, install a new element.

018;T90684 TBZ;EXPM EL 191187

SERVICE THE COOLING SYSTEM

CAUTION: DO NOT remove radiator cap unleas engine is cool. Then turn the cap slowly to the stop. Release all pressure before you remove cap.

Drain, flush, and fill the cooling system every Fall.

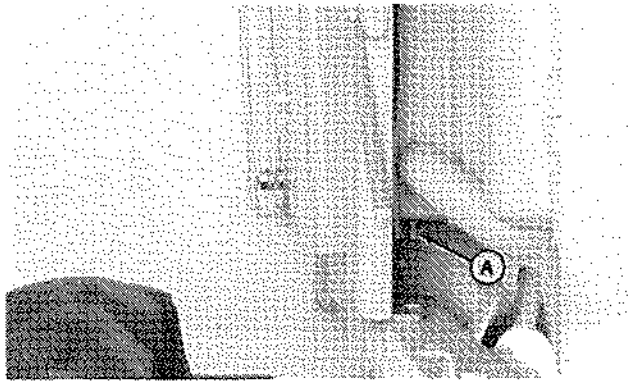


91A;T6162AY 04T;90 K241. 171188

DRAIN THE COOLING SYSTEM

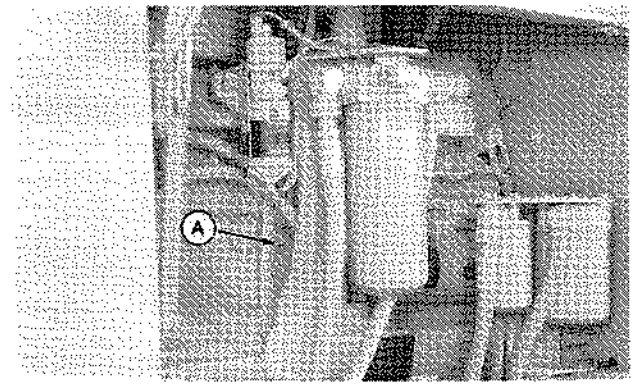
CAUTION: DO NOT remove radiator cap unless engine is cool. Then loosen the cap slowly to the stop. Release all pressure before removing cap.

1. Release pressure and then remove cap.
2. Connect a hose to drain cock (A) on radiator.
3. Turn drain cock counterclockwise to open valve.



91A;T6177AA T82;90 C6 171285

4. Open petcock (A) to drain engine block.



91A;T6177AG T82;90 C8 171285

FLUSH THE COOLING SYSTEM

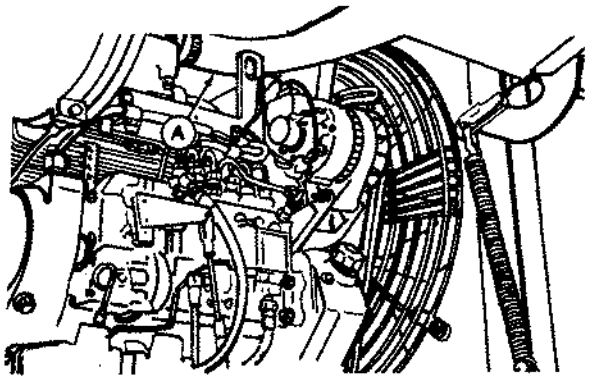
Use John Deere Heavy Duty Cooling System Cleaner with Detergent, John Deere Cooling System Quick Flush, or an equivalent.

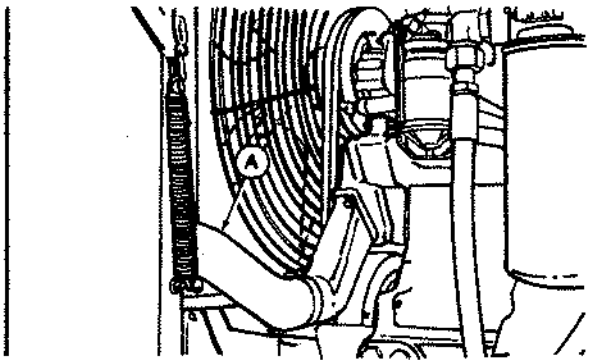
T82;BHMA C. 170687

CHECK COOLANT HOSES

Check hoses (A) for cracks and leaks.

Tighten clamps.





91A;Y6921AO, T6921AN 04T;90 K242. 191288

CLEAN RADIATOR

Check radiator for dirt, damage, leaks and loose or broken mounting.

Clean radiator fins.

04T;90 K243. 171188

TEST MINERAL CONTENT OF WATER

IMPORTANT: High levels of mineral content in your water may cause cooling syetem probleme. Only use water within the acceptable range as shown in the table.

The table gives the acceptable water for use in an ethylene glycol-type antifreeze and water mixture.

Acceptable Water		
Water Content	**50% Antitreeze 50% Water**	**Without Antitreeze**
Chlorides	100 ppm or less	50 ppm or less
Sulfates	100 ppm or less	50 ppm or less
Hardness as $CaCo_3$	200 ppm or less	100 ppm or less
Dissolved Solids	500 ppm or less	250 ppm or less
pH	6.5 or higher	6.5 or higher

ppm = parts per million

018;T5882AP T82;FLMA AG 121286

114;0090 05 100189

FILL THE COOLING SYSTEM

SPECIFICATION

Cooling system capacity ..... 7 gal (26.5 L)

Coolant level must be 4 in. (100 mm) from bottom of filler neck

ABOVE FREEZING TEMPERATURES: Antifreeze reduces cooling system efficiency. Fill cooling system with clean, soft water and add RE23182 John Deere Coolant Conditioner or equivalent.

IMPORTANT: Use only permanent-type, low silicate, ethylene glycol base antifreeze in coolant solution. Other types of antifreeze may damage cylinder seals.

FREEZING TEMPERATURES: Fill with permanent-type, low silicate, ethylene glycol antifreeze (without stop-leak additive) and clean, soft water. Add RE23182 John Deere Coolant Conditioenr or equivlanet.

All machines are shipped from the factory with a 50-50 mixture for protection to -37°C (-34°F). Adjust mixture accordingly to provide freeze protection for your machine.

04T;90 K244. 120189

TEST THE COOLANT FREEZE—PROTECTION LEVEL

See your John Deere dealer for JT05460 SERVICE-GARD™ coolant and battery tester. Follow directions included with the tester.

If you operate your machine in extremely cold temperatures, see your John Deere dealer for information on arctic operation.

01B;T85402 T82;EXMA CK. 230387

SERVICE BATTERIES CAREFULLY

CAUTION: Battery gss can explode. Keep sparks and flames away from batteries. Use a flashlight to check battery electrolyte level.

Never check battery charge by placing a metal object across the posts. Use a voltmeter or hydrometer.

Always remove grounded (-) battery clamp first and replace it last.

Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn akin, est holes in clothing, and cause blindness if splashed into eyes.

Avoid the hazard by:
1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when slectrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Use proper jump start procedure.

If you spill acid on yourself:
1. Flush your skin with water.
2. Apply baking soda or lime to help neutralize the acid.
3. Flush your eyes with water for 10—15 minutes. Get medical attention immediately.

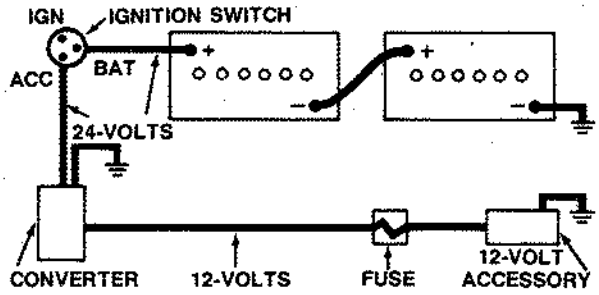
If acid is swallowed:
1. Drink large amounts of water or milk.
2. Then drink milk of magnesia, beaten eggs, or vegetable oil.
3. Get medical attention immediately.

If electrolyte spills on the floor, use one of the following mixtures to neutralize the acid: 0.5 kg (1 lb) baking soda in 4 L (1 gal) water, or 0.47 L (1 pt) household ammonia in 4 L (1 gal) water.

IMPORTANT: Electrolyte can damage paint and metal surfaces of your machine. Do not overfill the battery cells.

ADDING 12 VOLT ACCESSORIES

When possible, use 24 volt accessories. If 12 volt accessories are added, use a 24 volt to 12 volt converter. Converters are available from your John Deere dealer (see the Industrial Equipment Attachment Guide) or electronic retail stores. This converter may be wired into the ACC terminal of the ignition switch (see drawing).



Converter capacity requirements depend on the load of the accessories installed. Follow electronic dealer and manufacturer's recommendations to determine the capacity of the converter required and its installation requirements.

DO NOT connect an accessory to one battery. Connecting a 12-volt accessory to one battery will cause one battery to overcharge, and the other battery to undercharge, causing battery failure.

018;T6520AJ 04T;90 C1. 010788

PRECAUTIONS FOR ALTERNATOR AND REGULATOR

When batteries are connected, follow these rules:

1. Disconnect negative (-) battery cable when you work on or near alternator or regulator.

2. DO NOT TRY TO POLARIZE ALTERNATOR OR REGULATOR.

3. Be sure alternator wires are correctly connected BEFORE you connect batteries.

4. Do not ground alternator output terminal.

5. Do not disconnect or connect any alternator or regulator wires while batteries are connected or while alternator is operating. (See Using Booster Battery.)

6. Connect batteries or a booster battery in the correct polarity (positive [+] to positive [+] and negative [-] to negative [-]).

7. Do not disconnect the batteries when engine is running and alternator is charging.

8. Disconnect battery cables before you connect battery charger to the batteries.

T82;EXMA I. 120188

CHECKING ELECTROLYTE SPECIFIC GRAVITY

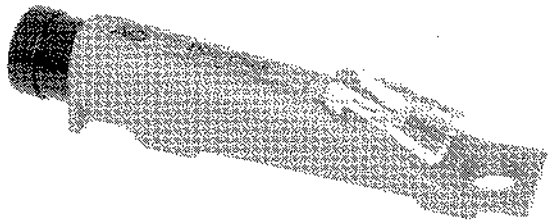
CAUTION: Battery gas can explode. Keep sparks and flames away from batteries.

Check the specific gravity of electrolyte in each battery cell.

See your John Deere dealer for JT05460 SERVICE-GARD™ battery and coolant tester. Follow directions included with the tester.

A fully charged battery will have a corrected specific gravity reading of 1.260. If the reading is below 1.200, charge the battery.

NOTE: In tropical areas, use 1.225 for the full-charge reading. In cold areas, use 1.280 for the full-charge reading.



018;T85402 T82;FLMA AH, 230387

USING BATTERY CHARGER

CAUTION: Do not charge a battery if the battary is frozen or it may explode. Warm battery to 60°F (16°C).

A battery charger may be used as a booster to start engine.

IMPORTANT: Do not use bsttery charger as a booster if a battery has a 1.150 specific gravity reading or lower. Turn off charger before connecting or disconnecting it.

Disconnect battery ground before you charge batteries in the machina to prevent damage to electrical components.

T82;EXMA G, 180788

REPLACE BATTERIES

Your grader has two 12 volt batteries with negative (−) ground. Use only batteries meeting one of the specifications below.

BATTERY SPECIFICATIONS

	OPTIONS	
Cold cranking amps at −18°C (0°F)	570	800
Cold cranking amps at −29°C (−20°F)	450	640
180 Minutes reserve capacity at 25 amps	180	310

04T;90 K245, 060189

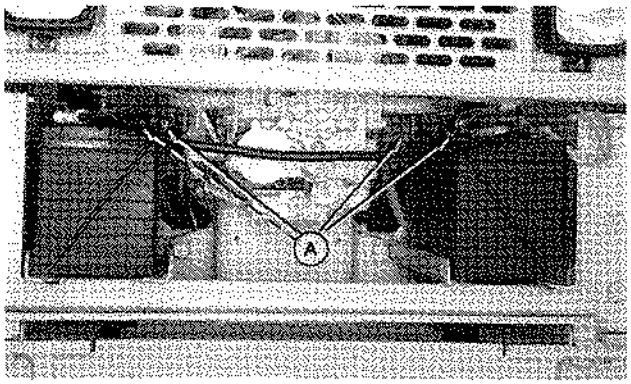
REMOVE BATTERIES

1. Remove four cap screws to remove bumper.

2. Disconnect negative (—) battery cables first, then positive cables.

3. Remove two nuts (A) and hold down bracket.

4. Slide batteries out of compartment.



91A;T6236AA T82;90 C15 171285

REPLACE FUSES

The fuse box is on the front of the side console. Both fuses and circuit breakers are located in fuse box. Cab heater fan fuses are located on the side and rear of right console.

IMPORTANT: Install fuse (blade type) with correct amperage rating.

A—Circuit Breaker **B—Fuse**

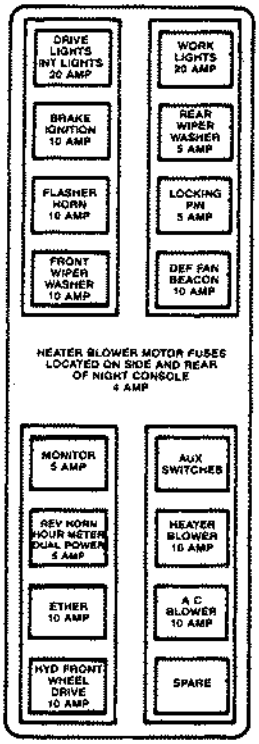


TABLE 1 - FUSE COLOR CODES

Ampere Rating	Color
3	Violet
4	Pink
5	Tan
7-1/2	Brown
10	Red
15	Light Blue
20	Yellow
25	Natural (White)
30	Light Green

91A;T6921AH, T6167AS 04T;90 K246, 221288

CIRCUIT BREAKERS

When a circuit breaker opens because of a short circuit or overloading, lights will go out.

Turn off light and key switches. Wait 1 minute before starting machine or turning on lights.

Circuit breaker will reset itself.

If circuit continues to open, see your John Deere dealer.

04T;90 K247. 171188

CHECK NEUTRAL START SYSTEM

1. Engage park brake.

2. Move transmission selector lever to 1st gear.

3. Turn key switch to START position. Starter must not crank. If starter cranks engine, release key. Do not operate machine.

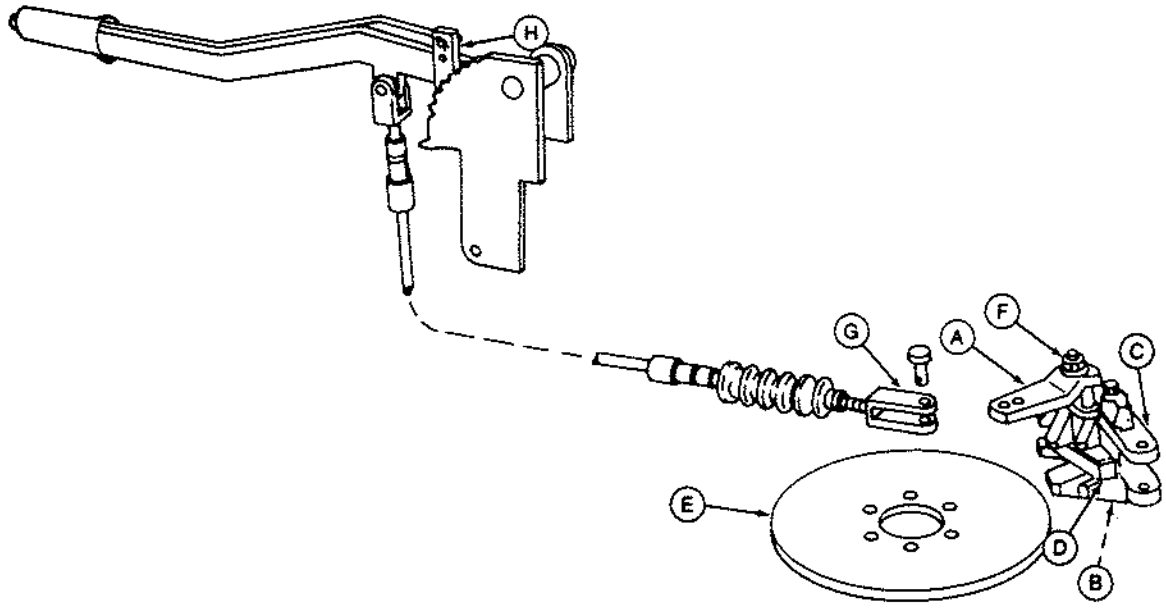
4. Repeat test with selector lever in each gear, both forward and reverse.

IMPORTANT: Do not operate machine if starter cranks engine with control lever in any gear except neutral. See your John Deere dealer.

5. Move control lever to neutral (N) and turn key switch to START position. Starter should crank engine.

04T;90 K248. 100189

ADJUST PARK BRAKE



1. Disconnect park brake cable from lever (A).

2. Adjust cap screw (B) (in transmission cover under caliper (C)) until bottom friction pad (D) just touches bottom of brake disk (E).

3. Adjust lock nut (F) (on top of caliper lever (A)) until top friction pad just touches brake disk. Move disk back and forth to check for free movement.

NOTE: Replace brake pads when remaining friction material measures less than 0.10 in. (2.5 mm).

4. Disengage park brake.

5. Position caliper lever (A) in center position.

6. Adjust yoke (G) until hole in yoke line up with outside hole in caliper lever. Install pin.

Park brake should be set tight when pawl (H) reaches first or second notch.

6. Drive unit forward and reverse for a short time and check for drag or heating of brake disk. Readjust if necessary.

91A;T6246AE 04T;90 K249. 100189

CHECK AND ADJUST TOE-IN

1. Park grader on a level surface.

2. Lower blade just enough to raise front wheels slightly off the ground.

3. Straighten wheels to vertical position.

4. Turn wheels to align steering cylinder pin (A) with oscillation pin (B).

5. Measure the distance between tie rod pins (C) on each tie rod.

The difference between the distances should be 0.0—0.10 in. (0.0—2.5 mm).

6. If the distance is greater that 0.10 in. (2.5 mm), loosen tie rod nuts (D) on one tie rod.

7. Turn the tie rod until the distance between the tie rod pins is within 0.10 in. (2.5 mm) of second tie rod.

8. Measure distance (E) from ground to center of hub.

9. At height (E), make a mark in center of tread on front and rear of each front tire.

10. Measure distance between front marks (F).

11. Measure distance between rear marks (G).

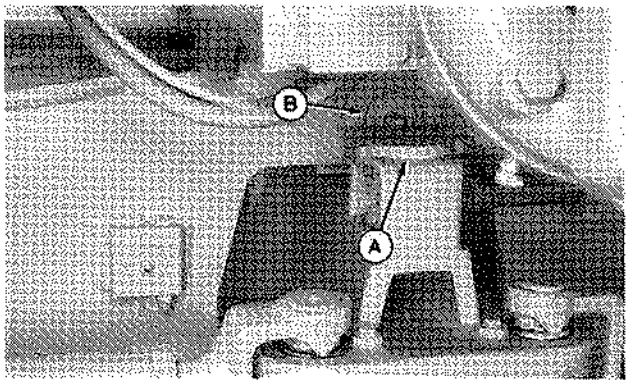
Distance between front marks (F) should be 0.0—0.50 in. (0.0—13 mm) less than the distance measured between rear marks (G).

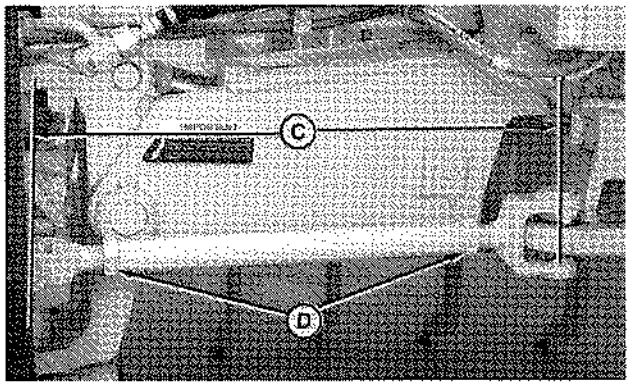
12. If difference is greater than 0.50 in. (13 mm), loosen tie rod nuts on both tie rods.

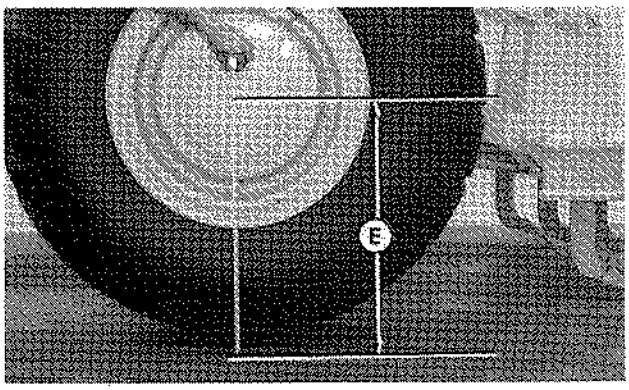
13. Turn each tie rod the same number of turns until difference is less than 0.50 in. (13 mm).

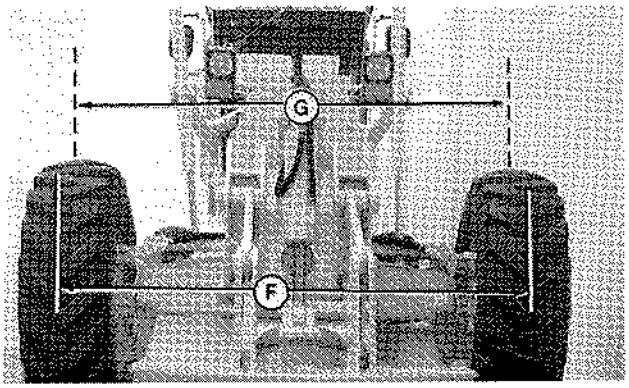
14. Tighten nuts to 330 lb-ft (447 N·m).

NOTE: After adjustments are made, turn front wheels to the stops both ways to check for interference.









ADJUST FRONT AXLE BEARINGS—UNITS WITHOUT FRONT WHEEL DRIVE

1. Remove wheel. Remove hub cap (A) and gasket (D).

2. Remove cotter pin (B) and slotted nut (C).

3. Remove retainer washer (E) and bearing cone (F).

4. Remove hub (H).

5. Remove bearing cone (J), oil seal cup (K),and oil seal (L).

6. Clean all parts. Replace worn or damaged parts.

7. Pack bearing cones with grease. (See Fuels and Lubricants chapter.)

8. Assemble bearing cone, oil seal cup, and oil seal into hub.

9. Place hub on axle. Install bearing cone (F) and retainer washer.

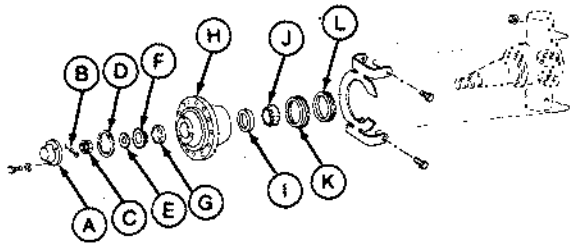
10. Apply lubricant to threads.

11. Install slotted nut. Tighten nut to 70 lb-ft (95 N·m) while turning front wheel hub to seat bearings. Loosen nut to the nearest alignment of slot with hole in shaft. Install cotter pin.

12. Install hub cap and gasket.

13. Install wheel.

NOTE: If you operate the grader often in wet or muddy conditions, clean and pack bearings as necessary.



A—Hub Cap
B—Cotter Pin
C—Slotted Nut
D—Gasket
E—Retainer Washer
F—Bearing Cone
G—Bearing Cup
H—Hub
I—Bearing Cup
J—Bearing Cone
K—Oil Seal Cup
L—Oil Seal

CHECK DRAFT BALL PIVOT CLEARANCE

1. Lower blade to ground.

2. Move grader back and forth slightly.

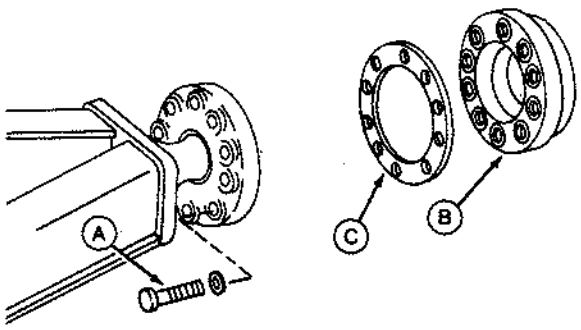
3. Check for excessive looseness (more than 0.059 in. (1.5 mm)).

CAUTION: Place support under front of draft frame before making adjustment.

4. To adjust clearance, remove cap screws (A) and ball retainer (B).

5. Remove shims (C), as required. Ball should turn by hand pressure without binding.

6. Install retainer and cap screws.



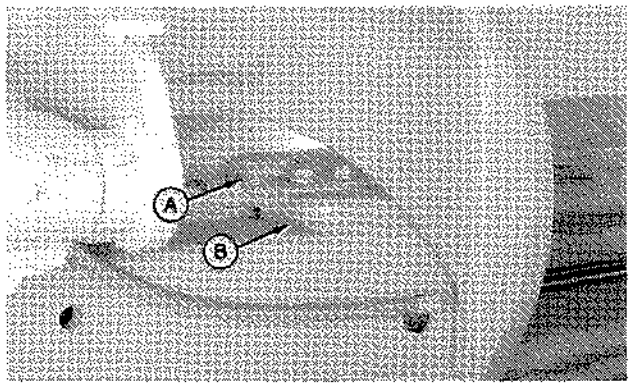
91A;T6236BP 04T;90 K253, 100189

ADJUST BLADE SIDE SHIFT GUIDES

1. Rest blade lightly on the ground. Raise and lower blade slightly to check tightness of the guides. Blade should slide easily.

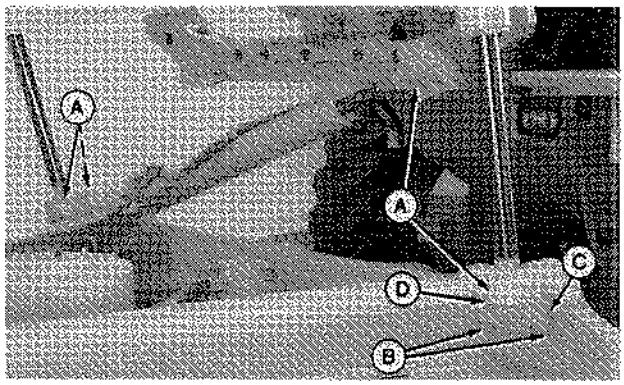
2. Remove retainer (A) and add or remove shims (B) as needed.

3. Tighten retainer cap screws to 445 lb-ft (603 N·m).



91A;T6164BI 04T;90 K255, 100189

CHECK CYLINDER BALL AND SOCKET CLEARANCES



1. Lower blade to ground. Check each ball and socket assembly (A).

2. Move cylinder without load. Ball should move freely.

3. Check for excessive looseness (more than 0.030 in.) (0.76 mm)).

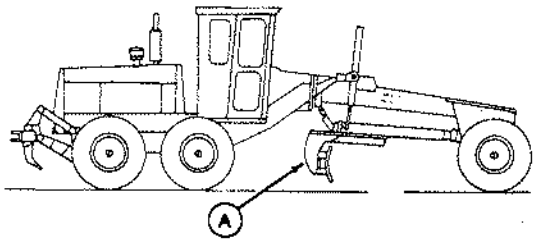
4. To adjust clearance, remove cap screws (B) and cap (C).

5. Remove shims (D), as necessary.

6. Install cap and cap screws.

91A;T6164BL T82;90 C28 181285

CIRCLE MEASUREMENT AND ADJUSTMENT



To determine circle binding or draft frame/circle wear, measure for proper clearance prior to disassembly or adjustment work.

Grader must first be placed in position to check.

1. Raise and rotate blade (A) 90 degrees to main frame. Align circle drive pinion tip with root of circle tooth.

2. Install a C-clamp (B) to pull top of circle up against draft frame wear pads.

3. Lower the blade to push top of circle against draft frame rear wear pads.

4. Move machine slightly forward with the blade down to pull the circle back against the front supports.

5. The circle top surface must be against at least three wear pads and the front supports against the circle.

91A;T6948AB 04T;90 K256 121288

The unit is now in position to begin measurements.

Measurement steps required are:

1. Measure circle drive pinion tip to root of circle tooth. Specified dimension range is 0.120—0.320 in. (3—8 mm). Less than 0.120 in. (3 mm) indicates worn front supports with circle against draft frame pads.

2. Check minimum vertical clearance between circle and each support. Specification is 0.010—0.080 in. (0.25—2.0 mm).

3. With circle against front supports, check horizontal clearance between circle and draft frame. Specification is total of of 0.030—0.060 in. (0.75—1.5 mm) for two rear supports.

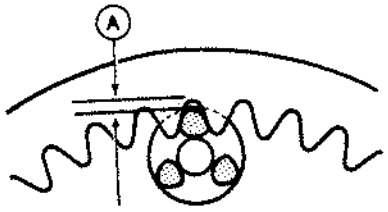
After performing these steps to determine relative starting position, proceed with adjustments as follows on these pages.

04T;90 K257 191288

CIRCLE DRIVE PINION

1. If clearance (A) is less than 3 mm (0.12 in.) circle supports must be replaced.

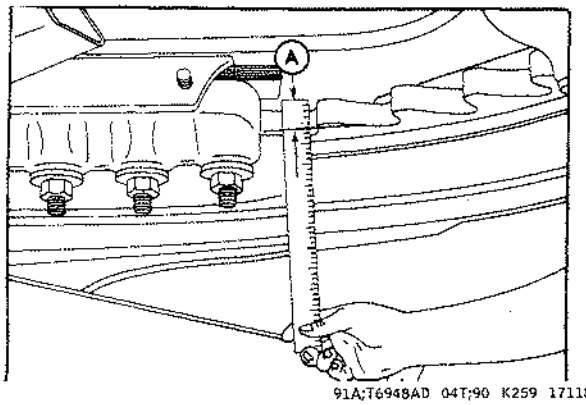
2. If clearance is more than 8 mm (0.32 in.) check that the circle is tight against the front supports and inspect the drive pinion for excessive wear.



91A;T6948AC 04T;90 K258 171188

ADJUST VERTICAL CLEARANCE

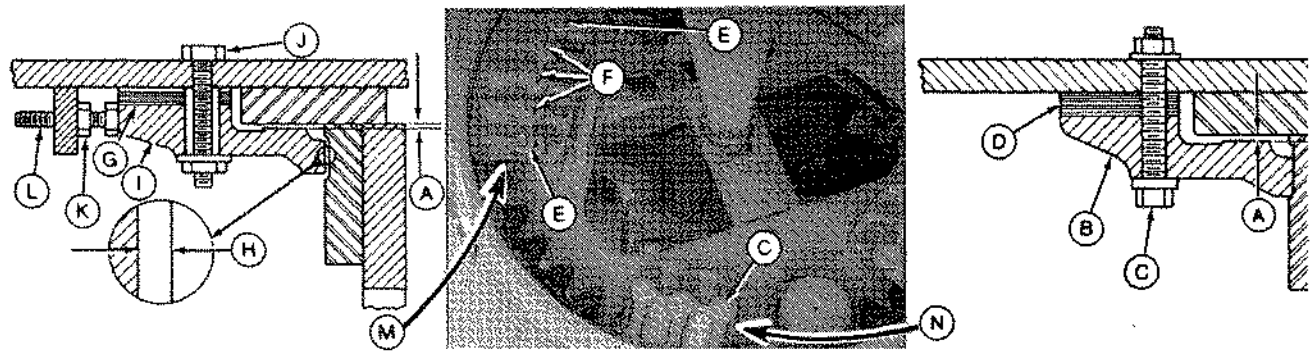
1. Measure the distance (A) from bottom of draft frame to bottom of circle tooth on both sides of each support.



91A;T6948AD 04T;90 K259 171188

1T4;0090 17 100189

ADJUST VERTICAL AND HORIZONTAL CLEARANCE



A—Vertical Clearance
B—Front Support
C—Cap Screw
D—Shims
E—Cap Screws
F—Cap Screw
G—Shims
H—Horizontal Clearance
I—Rear Support
J—Cap Screws
K—Stop Nuts
L—Jack Screws

2. Adjust vertical clearance (A) of front support by loosening cap screws (C) and adding or removing shims (D).

Use the greatest depth measurement found at each support in the following equation:

Depth measurement minus (—) 1.066 in. (1.67 mm) equals (=) minimum shim pack thickness required.

3. Adjust vertical clearance (A) of rear supports by removing end cap screws (E). Remove washers and install two cap screws with nuts flush with end of cap screws.

CAUTION: The two end cap screws (E) must securely hold the rear support during adjustment.

4. Install correct number of shims using the depth measurement in step #2.

5. Leave the rear support cap screws loose if horizontal adjustment is performed.

91A;T6948AE 04T;90 K276 120189

ADJUST HORIZONTAL CLEARANCE

1. Check horizontal clearance (H) of rear supports. Both rear supports (I) must add up to 0.03—0.06 in. (0.75—1.5 mm).

2. Adjust horizontal clearance (H) by raising the moldboard off the ground. Loosen cap screws (J) and stops nuts (K). Turn jack screws (I) equally against both rear supports (I) until rear supports are tight against the circle wear groove. Back off jack screws 1/4 turn and tighten stop nuts. Push the rear supports against the jack screws and tighten cap screws (J).

FINAL CHECK

1. Put a thin coating of multi-purpose grease on the top and bottom surfaces of the circle gear and inside diameter of the circle wear surface.

2. Rotate circle to determine if adjustments are too tight and where binding might occur.

3. If horizontal adjustments cause the circle to bind, back off jack screws (L) only enough to allow the circle to rotate freely.

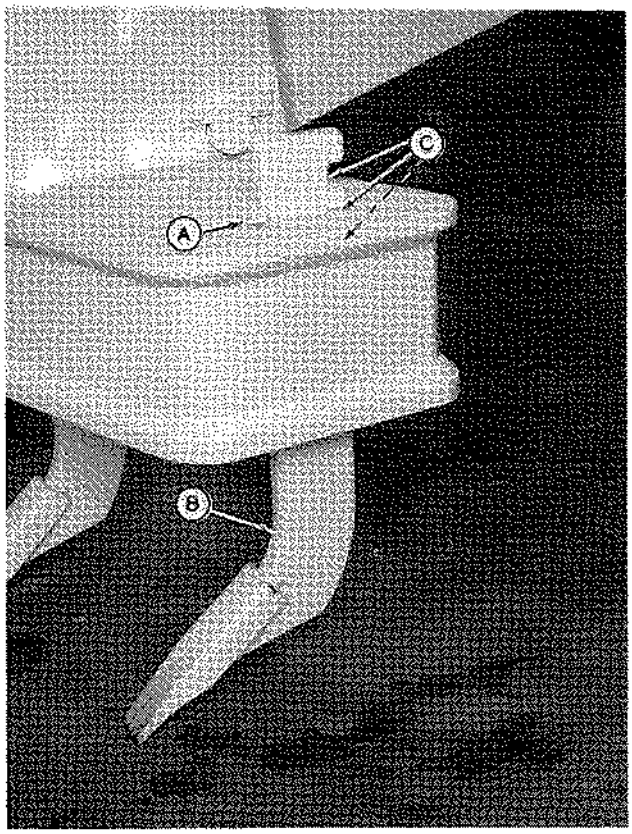
4. If vertical adjustment causes the circle to bind, add shims (D) or (G) to the supports that are too tight. Circle must rotate freely.

04T;90 K26? 110189

REPLACE SCARIFIER SHANK

1. Lift shank (B) to relieve pressure.
2. Pull J-hook (A) up to remove.
3. Pull shank forward and drop down.

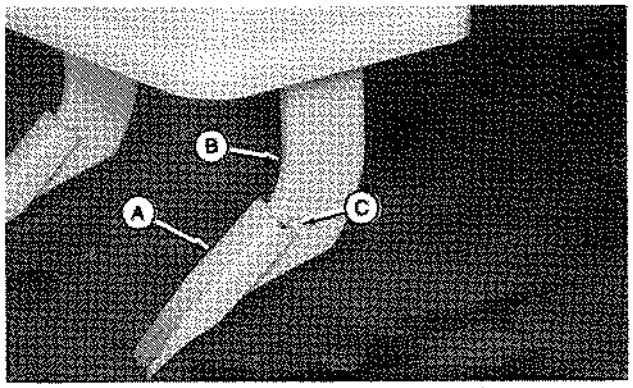
NOTE: New shanks can be adjusted to three positions (C). For heavy work, move shanks up and set J-hook.



91A;T6913AR1 04T;90 K262. 121288

REPLACE SCARIFIER TOOTH

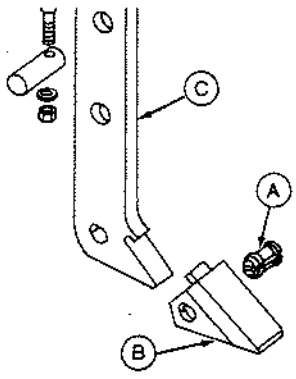
1. Pry tooth (A) away from shank (B).
2. Slide new tooth on to shank.
3. Hammer side of new tooth into depression (C) on each side of the shank.



91A;T6913AR 04T;90 K263. 171188

REPLACE RIPPER TOOTH

1. Drive out pin (A).
2. Drive tooth (B) from shank (C).
3. Install new tooth and shank.



018;T6236BR1 04T;90 K264. 171188

ADJUST RIPPER DIGGING DEPTH

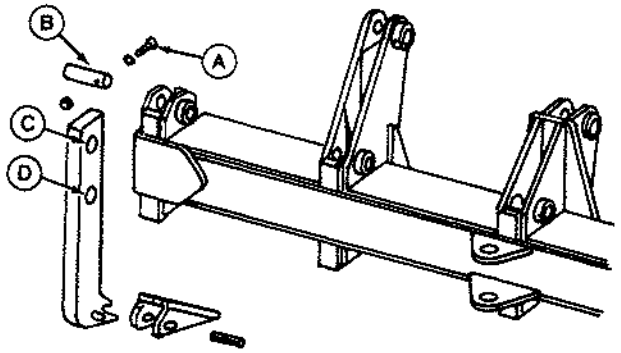
CAUTION: Shank is heavy and may drop when pin is removed.

1. Remove cap screw (A) and pin (B).

2. Place pin in hole (C) for maximum digging depth or hole (D) for shallow digging depth.

3. Install pin and cap screw.

NOTE: Provide more clearance when ripper is not being used by placing pin in hole D, or by turning shank upside down and placing pin in hole C.

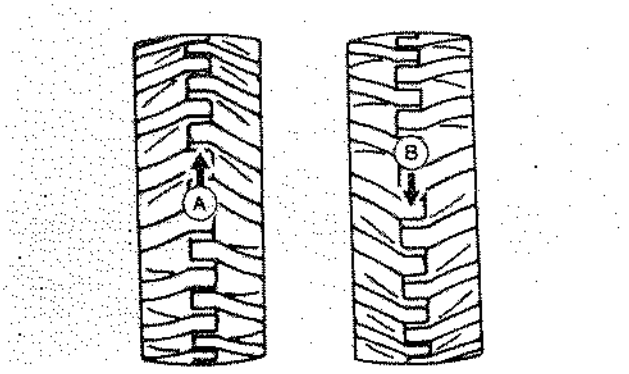


91A;T6238AG 04T;90 K265. 171188

TIRE CLEATS

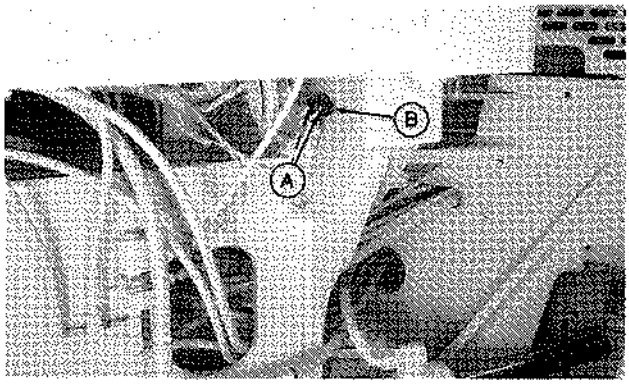
Install tires as shown. Check "V" made by cleats from front of grader.

A—Front tires on 670B
B—All tires on 672B and rear tires on 670B



91A;T6236BQ 04T;90 K266. 171188

ADJUST REAR STEER GAUGE

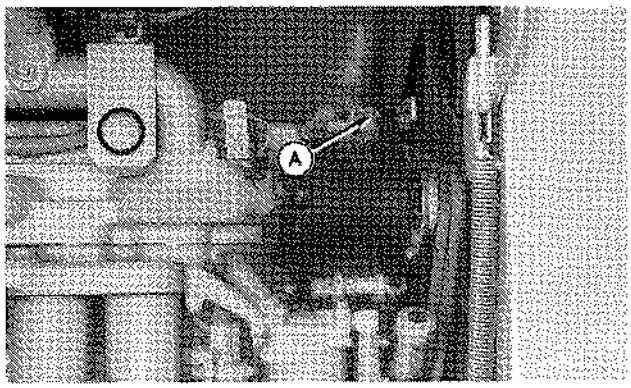


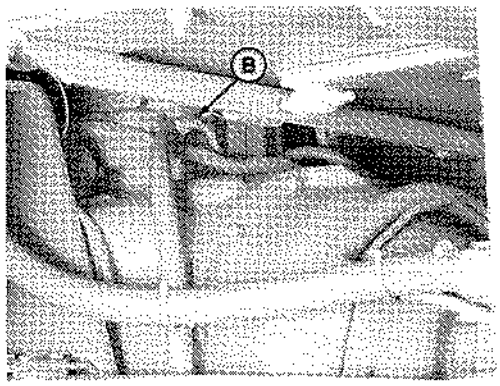
Needle on rear steer gauge must be centered when machine is aligned.

1. Align machine by making sure rear wheel tread follows directly over front wheel tread.
2. Turn key to ON position.
3. Loosen two screws (A) on sensor (B).
4. Rotate sensor until needle is centered on gauge.
5. Tighten screws.

91A;T6224AB 04T;90 K267. 171188

HEATER VALVES





Close valve (B) and turn off heater knob during warm weather.

Close valves (A and B) before repairing heater hose or heater core.

91A;T6179AL2, T6246AB TB2;90 C43 181285

CLEAN CAB FRESH AIR FILTER—IF EQUIPPED

1. Loosen two screws and remove grille.

2. Remove fresh air filter. Replace if damaged.

3. Clean filter in one of these ways:

Tap it on a flat surface with the dirty side down.

Use compressed air opposite to the normal air flow.

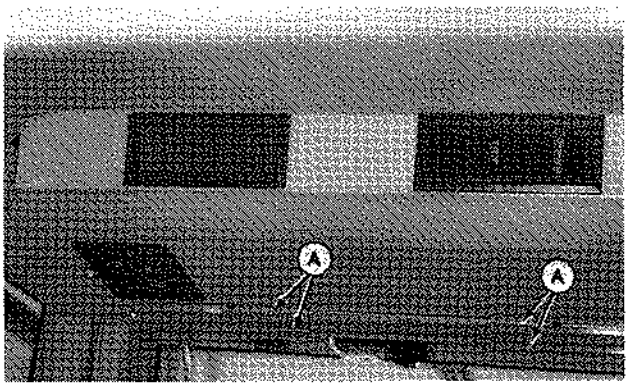
CAUTION: Reduce compressed air to less than 30 psi (210 kPa) (2 bar) when using for cleaning purposes. Clear area of bystanders, guard against flying chips, and wear personal protection equipment including eye protection.

Wash the filter in warm, soapy water. Flush the filter. Let it dry before using the air conditioner.

4. Replace filter and grille.

91A;T6186A8 04T;90 K269. 171188

CLEAN CAB RECIRCULATING AIR FILTER—IF EQUIPPED



1. Remove four screws (A) holding grille. Remove grille.

2. Remove filter.

CAUTION: Reduce compressed air to less than 30 psi (210 kPa) (2 bar) when using for cleaning purposes. Clear area of bystanders, guard against flying chips, and wear personal protection equipment including eye protection.

3. Clean filter in one of these ways:

Use compressed air opposite to the normal air flow.

Wash the filter in warm, soapy water. Flush the filter. Let it dry before using the air conditioner.

4. Install filter and grille.

91A;T6181AS1 04T;90 K270. 100189

CHANGE REVERSE WARNING ALARM VOLUME—IF EQUIPPED

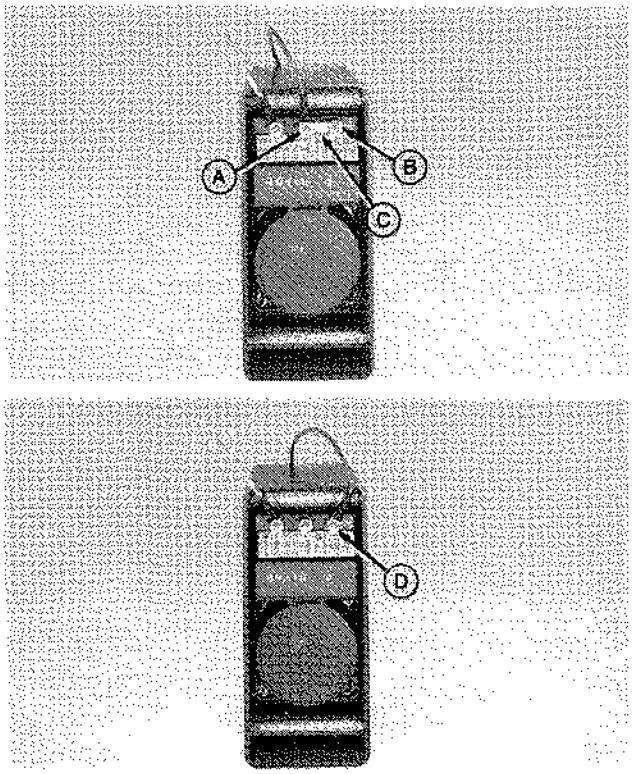
IMPORTANT: The reverse warning alarm is set on high volume at the factory. It may be necessary to adjust the volume to meet local regulations.

NOTE: Alarm removed from machine for clarity of photograph.

1. To change alarm to low volume, remove nut (A) and disconnect red wire from "POS HI" terminal.

2. Remove nut (B) and shorting bar (C).

3. Attach red wire to "POS LOW" terminal (D). Install nut and tighten securely. Save shorting bar for future use.



018;T5810AA, T5810AB T82;FLMA AK 140685

HARDWARE TORQUE SPECIFICATIONS

Check cap screws and nuts to be sure they are tight. If hardware is loose, tighten to torque shown on the following charts unless a special torque is specified.

T82;SKMA AT 270286

METRIC SERIES TORQUE CHART

CAUTION: Use only metric tools on metric hardware. Other tools may not fit properly. They may slip and cause injury.

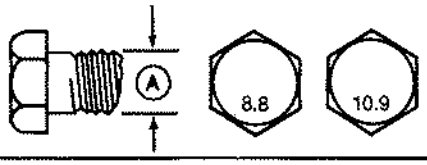
DO NOT use these values if a different torque value or tightening procedure is listed for a specific application. Torque values listed are for general use only. Check tightness of cap screws periodically.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original.

Make sure fastener threads are clean and you properly start thread engagement. This will prevent them from failing when tightening.

Tighten cap screws with plastic insert or crimped steel-type lock nuts to approximately 50 percent of amount shown in chart. Tighten toothed or serrated-type lock nuts to full torque value.



BOLT TORQUE CHART

Bolt Diameter "A"	Wrench Size	Marking on Head			
		8.8		10.9	
		N•m	(lb-ft)	N•m	(lb-ft)
5 mm	8 mm	6	(4.5)	9	(6.5)
6 mm	10 mm	10	(7.5)	15	(11)
8 mm	13 mm	25	(18)	35	(26)
10 mm	16 mm	50	(37)	75	(55)
12 mm	18 mm	85	(63)	130	(97)
16 mm	24 mm	215	(159)	315	(232)
20 mm	30 mm	435	(321)	620	(457)
24 mm	36 mm	750	(553)	1070	(789)
30 mm	46 mm	1495	(1103)	2130	(1571)

AB6;TS232 053;TORQ2. 090888

INCH SERIES TORQUE CHART

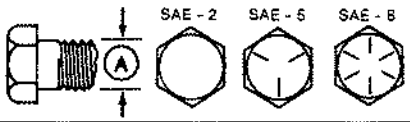
DO NOT use these values if a different torque value or tightening procedure is listed for a specific application. Torque values listed are for general use only. Check tightness of cap screws periodically.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original.

Make sure fastener threads are clean and you properly start thread engagement. This will prevent them from failing when tightening.

Tighten cap screws with plastic insert or crimped steel-type lock nuts to approximately 50 percent of amount shown in chart. Tighten toothed or serrated-typed lock nuts to full torque value.



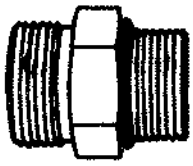
BOLT TORQUE CHART

Bolt Diameter "A"	Wrench Size	Marking on Head					
		SAE 2		SAE 5		SAE 8	
		N•m	(lb-ft)	N•m	(lb-ft)	N•m	(lb-ft)
3/8"	9/16"	24	(18)	41	(30)	54	(40)
7/16"	5/8"	41	(30)	68	(50)	95	(70)
1/2"	3/4"	61	(45)	102	(75)	142	(105)
9/16"	13/16"	88	(65)	142	(105)	203	(150)
5/8"	15/16"	122	(90)	197	(145)	278	(205)
3/4"	1-1/8"	217	(160)	353	(260)	495	(365)
7/8"	1-5/16"	224	(165)	563	(415)	800	(590)
1"	1-1/2"	332	(245)	848	(625)	1193	(880)
1-1/4"	1-7/8"	665	(490)	1492	(1100)	2393	(1765)

AB6;TS233 053;TORQ1. 090888

SERVICE RECOMMENDATIONS FOR O-RING BOSS FITTINGS

Straight Fitting

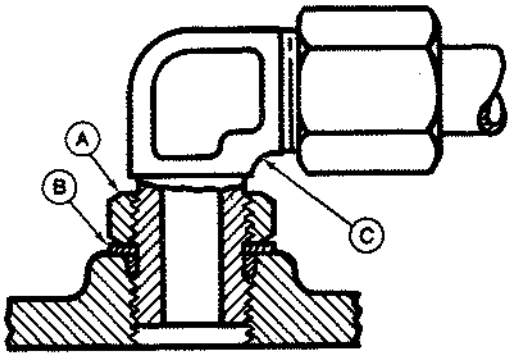


1. Inspect O-ring boss seat for dirt or defects.

2. Lubricate O-ring with petroleum jelly. Place electrical tape over threads to protect O-ring. Slide O-ring over tape and into O-ring groove of fitting. Remove tape.

3. Tighten fitting to torque value shown on chart.

Angle Fitting



1. Back-off lock nut (A) and back-up washer (B) completely to head-end (C) of fitting.

2. Turn fitting into threaded boss until back-up washer (B) contacts face of boss.

3. Turn fitting head-end (C) counterclockwise to proper index (maximum of one turn).

4. Hold fitting head-end (C) with a wrench and tighten locknut (A) and back-up washer (B) to proper torque value.

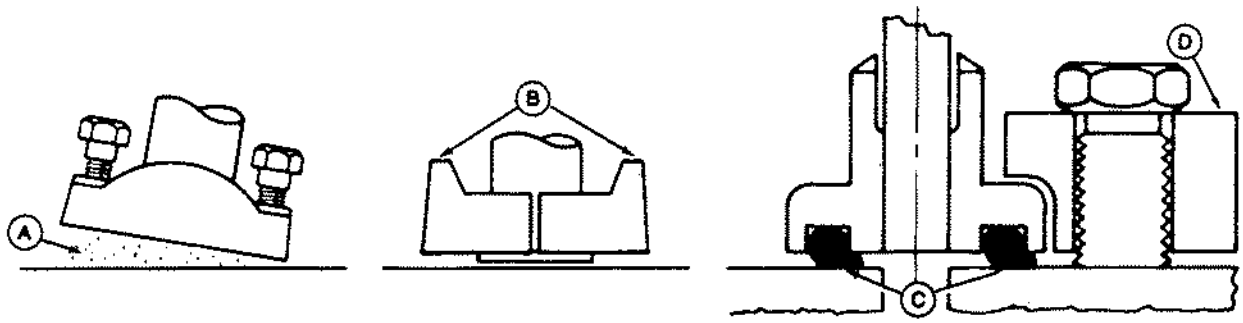
NOTE: Do not allow hoses to twist when tightening fittings.

TORQUE VALUE CHART

Thread Size	Torque N·m	(lb-ft)
3/8-24 UNF	8	(6)
7/16-20 UNF	12	(9)
1/2-20 UNF	16	(12)
9/16-18 UNF	24	(18)
3/4-16 UNF	46	(34)
7/8-14 UNF	62	(46)
1-1/16-12 UN	102	(75)
1-3/16-12 UN	122	(90)
1-5/16-12 UN	142	(105)
1-5/8-12 UN	190	(140)
1-7/8-12 UN	217	(160)

NOTE: Torque tolerance is ± 10%.

METRIC SERIES FOUR BOLT FLANGE FITTING SERVICE RECOMMENDATIONS



A—Sealing Surface **B—Split Flange** **C—Pinched O-Ring** **D—Single Piece Flange**

1. Clean sealing surfaces (A). Inspect. Scratches cause leaks. Roughness causes seal wear. Out-of-flat causes seal extrusion. If defects cannot be polished out, replace component.

2. Install the correct O-ring (and backup washer if required) into groove using petroleum jelly to hold it in place.

3. Split flange: Loosely assemble split flange (B) halves. Make sure split is centrally located and perpendicular to port. Hand tighten cap screws to hold parts in place. Do not pinch O-ring (C).

4. Single piece flange (D): Place hydraulic line in center of flange and install four cap screws. Flange must be centrally located on port. Hand tighten cap screws to hold flange in place. Do not pinch O-ring.

5. After components are properly positioned and cap screws are hand tightened, tighten one cap screw, then tighten the diagonally opposite cap screw. Tighten two remaining cap screws. Tighten all cap screws as specified in chart below.

DO NOT use air wrenches. DO NOT tighten one cap screw fully before tightening the others. DO NOT overtighten.

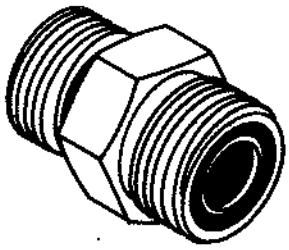
Thread[1]	Torque[2] N·m	Torque[2] lb-ft
M6	12	9
M8	30	22
M10	57	42
M12	95	70
M14	157	116
M16	217	160
M18	334	246
M20	431	318

1. Metric standard thread.

2. Tolerance ± 10%. The torques given are enough for the given size connection with the recommended working pressure. Increasing cap screw torque beyond these amounts will result in flange and cap screw bending and connection failures.

018;T6890BB 04T;90 K175 260888

SERVICE RECOMMENDATIONS FOR FLAT FACE O-RING SEAL FITTINGS



1. Inspect the fitting sealing surfaces. They must be free of dirt or defects.

2. Inspect the O-ring. It must be free of damage or defects.

3. Lubricate O-rings and install into groove using petroleum jelly to hold in place.

4. Push O-ring into the groove with plenty of petroleum jelly so O-ring is not displaced during assembly.

5. Index angle fittings and tighten by hand pressing joint together to insure O-ring remains in place.

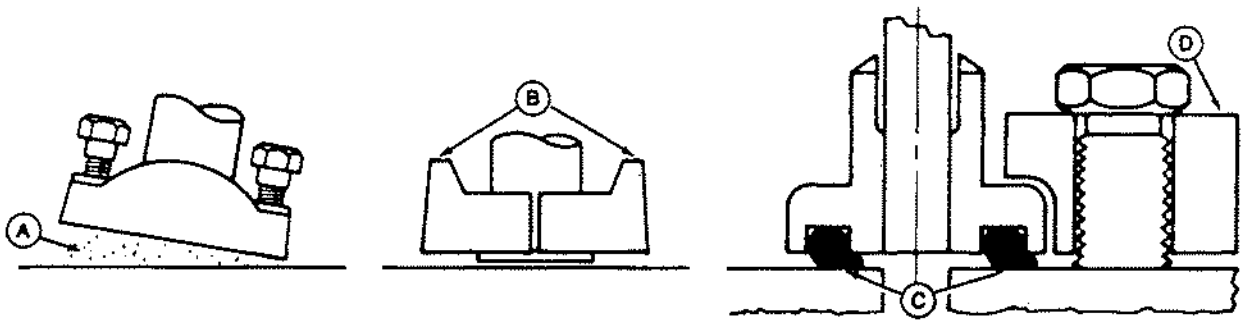
6. Tighten fitting or nut to torque value shown on the chart per dash size stamped on the fitting. Do not allow hoses to twist when tightening fittings.

FLAT FACE O-RING SEAL FITTING TORQUE

Nominal Tube O.D. mm	(in.)	Dash Size	Thread Size in.	Swivel Nut Torque Nm	(lb-ft)	Bulkhead Nut Torque Nm	(lb-ft)
6.35	0.250	-4	9/16-18	16	12	5.0	3.5
9.52	0.375	-6	11/16-16	24	18	9.0	6.5
12.70	0.500	-8	13/16-16	50	37	17.0	12.5
15.88	0.625	-10	1-14	69	51	17.0	12.5
19.05	0.750	-12	1 3/16-12	102	75	17.0	12.5
22.22	0.875	-14	1 3/16-12	102	75	17.0	12.5
25.40	1.000	-16	1 7/16-12	142	105	17.0	12.5
31.75	1.250	-20	1 11/16-12	190	140	17.0	12.5
38.10	1.500	-24	2-12	217	160	17.0	12.5

NOTE: Torque tolerance is +15 −20%.

INCH SERIES SAE FOUR BOLT FLANGE FITTING SERVICE RECOMMENDATIONS



A—Sealing Surface **B—Split Flange** **C—Pinched O-Ring** **D—Single Piece Flange**

1. Clean sealing surfaces (A). Inspect. Scratches cause leaks. Roughness causes seal wear. Out-of-flat causes seal extrusion. If defects cannot be polished out, replace component.

2. Install the correct O-ring (and backup washer if required) into groove using petroleum jelly to hold it in place.

3. Split flange: Loosely assemble split flange (B) halves. Make sure split is centrally located and perpendicular to port. Hand tighten cap screws to hold parts in place. Do not pinch O-ring (C).

4. Single piece flange (D): Place hydraulic line in center of flange and install four cap screws. Flange must be centrally located on port. Hand tighten cap screws to hold flange in place. Do not pinch O-ring.

5. After components are properly positioned and cap screws are hand tightened, tighten one cap screw, then tighten the diagonally opposite cap screw. Tighten two remaining cap screws. Tighten all cap screws as specified in chart below.

DO NOT use air wrenches. DO NOT tighten one cap screw fully before tightening the others. DO NOT overtighten.

Nominal Flange Size	Cap Screw Size[1]	Torque[2] N·m Min	N·m Max	lb-ft Min	lb-ft Max
1/2	5/16 - 18 UNC	20	31	15	23
3/4	3/8 - 16 UNC	28	54	21	40
1	3/8 - 16 UNC	37	54	27	40
1-1/4	7/16 - 14 UNC	47	85	35	63
1-1/2	1/2 - 13 UNC	62	131	46	97
2	1/2 - 13 UNC	73	131	54	97
2-1/2	1/2 - 13 UNC	107	131	79	97
3	5/8 - 11 UNC	158	264	117	195
3-1/2	5/8 - 11 UNC	158	264	117	195
4	5/8 - 11 UNC	158	264	117	195
5	5/8 - 11 UNC	158	264	117	195

1. Metric standard thread.

2. Tolerance ± 10%. The torques given are enough for the given size connection with the recommended working pressure. Increasing cap screw torque beyond these amounts will result in flange and cap screw bending and connection failures.

018;T6B90BB 04T;90 K174 291188

1T4;0090 29 100189

Operational Checkout

OPERATIONAL CHECKOUT

Use this operational checkout to check all systems and functions on the machine. This procedure is designed so you can make a quick check of the operation of the machine while doing a walk around inspection and performing specific checks from the operator's seat.

Should you experience a problem with your machine, you will find helpful diagnostic information in this checkout that will pinpoint the cause. This information may allow you to perform a simple adjustment yourself which will reduce the down time of your machine. Use the table of contents to help find adjustment procedures.

The information you provide after completing the operational checkout will allow you or your John Deere Dealer to pinpoint the specific test or repair work needed to restore the machine to design specifications.

A location will be required which is level and has adequate space to complete the checks. No tools or equipment are needed to perform the checkout.

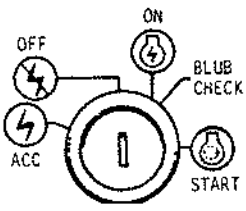
Complete the necessary visual checks (oil levels, oil condition, external leaks, loose hardware, linkage, wiring, etc.) prior to doing the checkout. The machine must be at operating temperature for many of the checks.

Start in the left column and read completely before performing check, follow this procedure from left to right. In the far right column, if no problem is found **(OK:)**, you will be instructed to **GO TO NEXT CHECK.** If a problem is indicated **(NOT OK:)**, you will be referred to **(GO TO:)** either a section in this manual or to your John Deere dealer for repair.

05T;95 K378. 140987

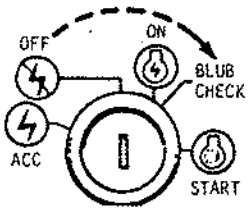
1 GAUGE AND MONITOR CHECKS (ENGINE OFF)

10T;9005 J131 060587

KEY SWITCH CHECK		Turn key to ACC. *LISTEN: Acc. relay must click.* *Turn key to ON.* *LISTEN: Acc. relay must click.* *LOOK: Fuel gauge must indicate fuel level. Rear steer gauge must indicate frame position.*	Turn key to BULB CHECK. *LOOK: All monitor lights must come on. STOP light must flash.* *LISTEN:Monitor alarm must sound.* *With unit in gear, turn key to START.* *LISTEN: Acc. relay must click.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer.

029;T6457AA 10T;9005 J598 060189

MONITOR BULB CHECK RELAY CHECK



Turn key from OFF to BULB CHECK.

LOOK: All monitor lights, red STOP light, and yellow CAUTION must come on.

LISTEN: Alarm must sound.

NOTE: If relay fails, monitor lights will have a 3—5 second dealy when key is turned to bulb check.

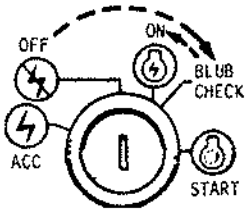
OK: Go to next check.

NOT OK: See your John Deere dealer.

029;T6457AC 10T;9005 J599 060189

MONITOR PRIMARY LEVEL CHECK

NOTE: A primary failure turns the red STOP light and alarm on.



Turn key to BULB CHECK and then release to ON.

LOOK: After a 3—5 second delay, the red STOP light must come on.

LISTEN: Alarm must sound.

NOTE: The monitor time delay is required to eliminate false indications which are caused by normal operation of the unit. For example, the transmission oil pressure drops momentarily when shifting. The time delay keeps the transmission oil pressure light off during this momentary pressure drop, therefore eliminating a false signal to the monitor display. The time delay is located inside the logic module.

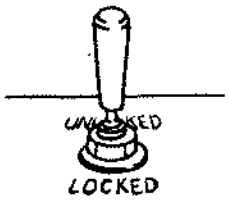
OK: Go to next check

NOT OK: See your John Deere dealer.

029;T6457AB 10T;9005 J600 060189

MONITOR SECONDARY LEVEL CHECK

NOTE: A secondary failure or unlocking the saddle lock pin turns the yellow CAUTION light on.



Start engine. Unlock saddle lock pin.

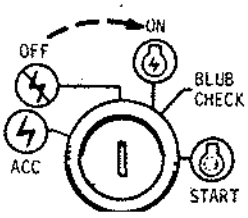
LOOK: Yellow CAUTION light must come on after a 3—5 second delay.

OK: Go to next check

NOT OK: See your John Deere dealer.

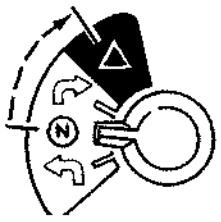
029;T6457AU 10T;9005 J601 110189

MONITOR OPERATING INFORMATION INDICATOR CHECKS (TURN SIGNALS AND DIFFERENTIAL LOCK)



Turn key switch OFF.
Turn key switch to ON without going to BULB CHECK.
Move turn signal switch to HAZARD warning position (4-way flasher).

LOOK: Both turn signal indicators must be flashing.



Start engine.

Engage differential lock.

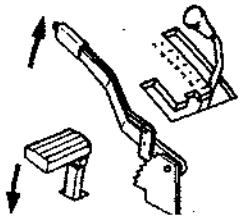
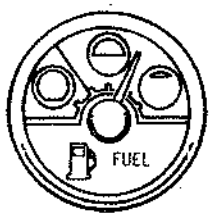
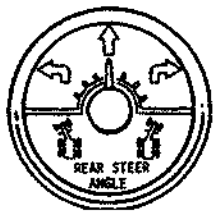
LOOK: Differential lock indicator must be on.

NOTE: Operating monitor lights are green and monitor the following functions:
Right Turn
Left Turn
Hazard Warning
Differential Lock (only when engine is running.)

OK: Go to next check

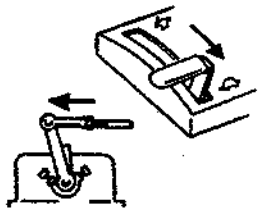
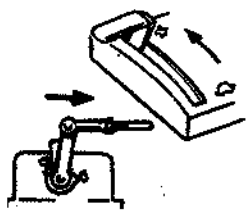
NOT OK: See your John Deere dealer.

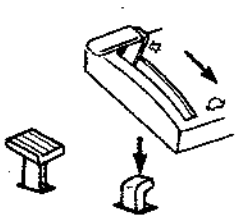
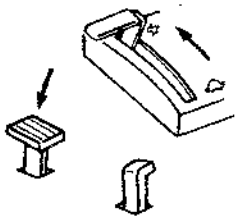
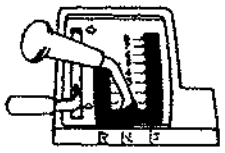
029;T6457AD, T6457AE 10T;9005 J602 060189

PARK BRAKE INDICATOR CHECK		Start engine. Apply park brake. Depress clutch pedal. Put transmission into 1st forward.	*LOOK: Park brake indicator and STOP light must come on.* *LISTEN: Alarm must sound.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457AF 10T;9005 J603 060189
FUEL GAUGE CHECK		Remove fuel cap and observe fuel quantity. Turn key switch ON.	*LOOK: Fuel gauge must indicate fuel quantity.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457AG 10T;9005 J604 060189
REAR STEER INDICATOR CHECK		Observe frame alignment. Turn key switch ON. *NOTE: Gauge reading.*	*LOOK: Rear steer indicator must indicate frame alignment.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457AH 10T;9005 J605 060189

❷ ENGINE SPEED AND TRANSMISSION LINKAGE CHECK

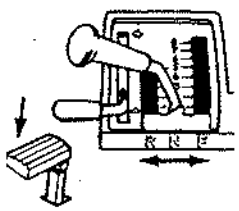
10T;9005 J140 060189

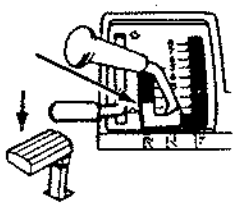
ENGINE SPEED CONTROL LINKAGE CHECK		More speed control lever to slow idle (turtle) position.	*LOOK: Long lever on injection pump must over-travel short lever.*	029;T6457AI 10T;9005 J606 060189
		Move speed control lever to fast idle (rabbit) position.	*LOOK: Long lever on injection pump must over-travel short lever.*	**OK:** Go to next check **NOT OK:** Adjust speed control linkage. Go to Periodic Maintenance/1000 Hours. 029;T6457AJ 10T;9005 J607 110189

SPEED CONTROL PEDAL CHECK (SLOW IDLE)		With engine running, move speed control lever to slow idle. Step on decelerator pedal.	*LISTEN: Engine must not decrease in rpm when decelerator is pushed.* *LOOK: Speed control lever must not contact end of slot.*	**OK:** Go to next check **NOT OK:** Adjust speed control linkage .Go to Periodic Maintenance/1000 Hours. 029;T6457AO 10T;9005 J608 060189
SPEED CONTROL PEDAL CHECK (FAST IDLE) **IMPORTANT: Do not increase engine rpm to fast idle until engine is warm.**		With engine running, move speed control lever to fast idle. Step on accelerator pedal.	*LISTEN: Engine must not increase in rpm when accelerator is pushed.* *FEEL: Lever must move from slow idle to fast idle easily.* *LOOK: Speed control lever must not contact end of slot. Speed control lever must remain in any position selected.*	**OK:** Go to next check **NOT OK:** Adjust speed control linkage. Go to Periodic Maintenance/1000 Hours. 029;T6457AP 10T;9005 J609 060189
TRANSMISSION SELECTOR LEVER LINKAGE CHECK		With engine off, move selector lever to all gears forward and reverse. *FEEL: Must feel eight distinct detents in forward and four in reverse. Lever must move freely between detents and in and out of neutral.*	*LOOK: Detents must align with numbered notches on shift quadrant.* *Move lever to neutral detent and release.* *FEEL: Lever in neutral must be held in notch by spring force.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457AK 10T;9005 J610 110189

❸ NEUTRAL START AND REVERSE WARNING ALARM CHECKS

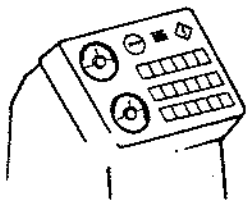
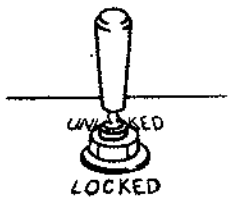
10T;9005 J149 240387

NEUTRAL START CIRCUIT CHECK	Depress clutch pedal. Move lever from neutral-detent to the neutral-forward position. Turn key switch to START. *LISTEN: Starting motor must not run.*		Move gear selector to the neutral-reverse position. Turn key switch to START. *LISTEN: Starting motor must not run.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457AQ 10T;9005 J611 110189

REVERSE WARNING ALARM CHECK		Depress clutch pedal. Start engine. Put transmission in 1st reverse.	*LISTEN: Reverse warning alarm must sound.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457AR 10T;9005 J612 060189

4 GAUGE AND MONITOR CHECKS (ENGINE RUNNING)

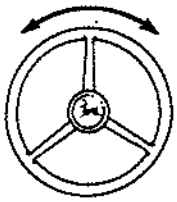
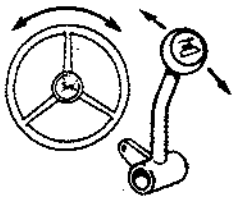
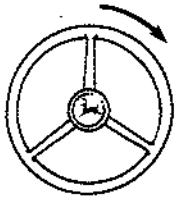
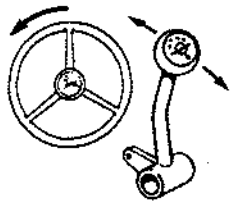
10T;9005 J93 180886

MONITOR CHECKS		Start engine and run at slow idle. Observe monitor lights. *LOOK: All monitor lights must go out within 15 seconds.* *LISTEN: Monitor alarm must quit pulsating.*	*NOTE: It is normal for the brake pressure, transmission pressure, and alternator volts monitor lights to stay on for a few seconds after the engine oil pressure light has gone out.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457AS 10T;9005 J613 060189
REAR STEER INDICATOR CHECK		Start engine. Operate rear steer function to maximum right position. *LOOK: Rear steer indicator needle must point to maximum right.*	Operate rear steer function to the maximum left position. *LOOK: Rear steer indicator needle must point to maximum left position.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457AT 10T;9005 J682 060389
SADDLE LOCKING PIN INDICATOR CHECK		Start engine. Lower blade to ground. Unlock saddle lock pin.	*LOOK: Lock pin indicator and yellow CAUTION light must come on after a 3—5 second delay.* *NOTE: Differential lock indicator may also come on due to increased hydraulic return circuit pressure with saddle lock pin unlocked.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457AU 10T;9005 J614 060189

DIFFERENTIAL LOCK INDICATOR CHECK		Start engine. Engage differential lock.	*LOOK: Differential lock indicator light must come on.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 10T;9005 J667 060189

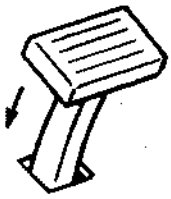
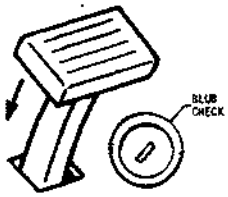
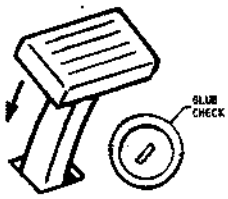
5 STEERING SYSTEM CHECKS

10T;9005 J105 220487

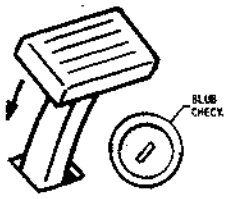
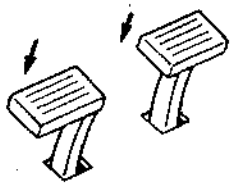
STEERING VALVE CHECKS		Run engine at slow idle. Turn steering wheel until wheels hit the right stop and then the left stop. Observe effort to turn steering wheel.	*LOOK: Front wheels must steer smoothly in both directions.* *When the steering wheel is stopped, the front wheels must stop.* *Excessive effort must not be required to turn the steering wheel.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457AV 10T;9005 J616 060189
STEERING INLET CHECK VALVE CHECK		Run engine at slow idle. Steer wheels to maximum left or right. Continue turning steering wheel. Actuate blade sideshift control lever. Observe steering wheel as blade control is actuated.	*LOOK: Steering wheel will "jerk" in the direction being turned, but must not "kickback".*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457AW 10T;9005 J617 060189
STEERING SYSTEM LEAKAGE		Run engine at slow idle. Turn steering wheel right until front wheels contact stop. Continue turning steering wheel with approximately 5 lb-force while counting steering wheel revolutions per minute. Repeat check to the left.	*LOOK: Steering wheel must not turn more the 5 rpm.* *NOTE: Use good judgement, excessive steering wheel rpm may not effect steering function during normal operation.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457AX 10T;9005 J618 060189
PRESSURE CONTROL VALVE CHECK		Run engine at slow idle. Operate circle rotate and turn front wheels to the left stop at the same time.	*LOOK: Wheels must turn to left stop.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457AY 10T;9005 J619 060189

6 BRAKE SYSTEM CHECKS

10T;9005 J162 041186

SERVICE BRAKE LINKAGE CHECK *NOTE: Transmission/hydraulic oil must be warmed to normal operating temperature. Differential lock off.*		Start engine. Run at slow idle. Depress and release pedal.	*LOOK: Pedal must return freely.*	**OK:** Go to next check **NOT OK:** Inspect linkage. 029;T6457BC 10T;9005 J620 090189
BRAKE ACCUMULATOR PRE-CHARGE CHECK		Run engine for 30 seconds to fill brake accumulator. Stop engine. Turn key switch to BULB CHECK and then release to ON.	Push brake pedal at 5 second intervals until low brake pressure light comes on. *NOTE: Red STOP indicator and buzzer will be on during this check due to low engine oil pressure with engine off.* *LOOK: A minimum of three applications must be made before light comes on.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457AZ 10T;9005 J621 090189
BRAKE ACCUMULATOR AND BRAKE VALVE NEUTRAL LEAKAGE CHECK (BRAKES RELEASED)		Run engine for 30 seconds to fill brake accumulator. Stop engine. Turn key switch to BULB CHECK and then release to ON. Wait 5 minutes. Push brake pedal at 5 second intervals until low brake pressure light comes on.	*NOTE: Red STOP light and buzzer will be on during this check due to low engine oil pressure with engine off.* *LOOK: A minimum of three applications must be made before light comes on.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457AZ 10T;9005 J622 090189

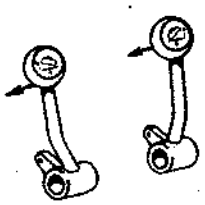
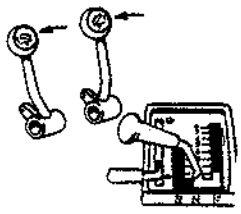
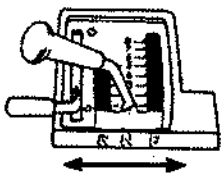
1T4;0095 07 100189

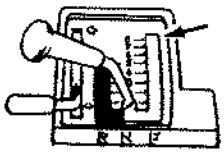
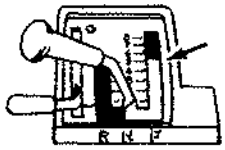
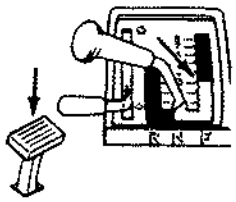
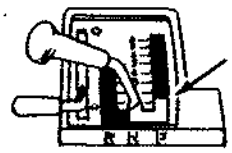
BRAKE VALVE AND BRAKE PISTON SEAL LEAKAGE CHECK (BRAKES APPLIED)		Run engine for 30 seconds to fill brake accumulator. Apply brakes. Stop engine. Turn key switch to BULB CHECK and then release to ON. Wait 2 minutes while observing low brake pressure indicator.	*NOTE: Red STOP light and buzzer will be on during this check due to low engine oil pressure with engine off.* *LOOK: Low brake pressure indicator must not come on for 2 minutes.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457AZ 10T;9005 J623 090189
SERVICE BRAKE CAPACITY CHECK		Run engine at fast idle. Operate unit in 3rd forward. Apply brakes to load engine.	Brakes must be able to slow unit until engine is "lugged" down to approximately 800 rpm.	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457BA 10T;9005 J624 090189
PARK BRAKE CAPACITY CHECK		Apply park brake. Run engine at half speed. Depress clutch pedal. Put transmission in 3rd forward. Slowly release clutch to lug engine to about 800 rpm.	*LOOK: Unit must not move.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 10T;9005 J625 090189

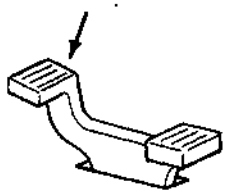
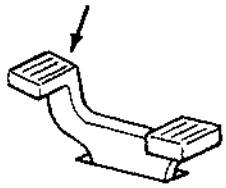
7 DRIVING CHECKS

IMPORTANT: To get accurate results for these checks, transmission-hydraulic oil must be at operating temperature.

10T;9005 J166 081186

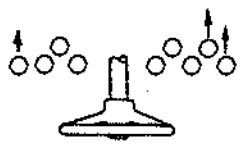
TRANSMISSION NOISE CHECK		Run engine at half speed. Shift transmission into eight forward and four reverse speeds, driving the unit a short distance in each speed.	*LISTEN: Excessive gear noise must not be heard in any gear.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 10T;9005 J626 090189
TRANSMISSION PUMP FLOW CHECK		Run engine at slow idle. Place selector lever in neutral-neutral. Depress clutch pedal. Raise blade to full height. Fully activate both blade levers to the power-down position	*LISTEN: Main hydraulic pump must not chatter as blade lowers to ground.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457BE 10T;9005 J627 090189
TRANSMISSION ELEMENT LEAKAGE CHECK *NOTE: Do Transmission Pump Flow Check before this check.*		Disengage tow disconnect. Raise blade to full height. Run engine at slow idle. Put transmission in 1st forward.	Fully activate both blade levers to the power-down position. Repeat check with transmission in each gear. *LISTEN: Main hydraulic pump must not chatter with transmssion in any gear.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457BF 10T;9005 J628 090189
INTERRUPTER VALVE CHECK		Run engine at approximately 1500 rpm. Raise blade and scarifier. Move grader to smooth hard surface. Move gear selector to neutral-forward and neutral-reverse.	*LOOK: Unit must not move.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457BG 10T;9005 J629 110189

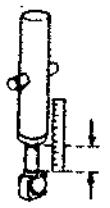
B3 B4 C3 ACCUMULATOR CHECK		Operate unit in 7th gear. Run engine at 1500 rpm. Make several shifts from 7th to 8th gear. Observe the response and sound of unit as these shifts are made.	*FEEL: Shift must be smooth.* *LISTEN: Transmission must not make a "clunk" sound.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457BJ 10T;9005 J630 090189
B1 B2 ACCUMULATOR CHECK		Operate unit in 5th forward. Run engine at 1500 rpm. Make several shifts from 5th to 6th and observe response of unit as this shift is made.	*FEEL: Unit must not seem or feel too aggressive as this shift is made.* *LISTEN:Transmission must not make a "clunk" sound.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457BK 10T;9005 J631 090189
C1 CLUTCH "DRAG" CHECK		Operate unit on a hard surface. Run engine at slow idle. Operate unit in 3rd forward and turn full left or right. This provides a slight load to stop unit when clutch is depressed. Depress clutch pedal and observe unit as it stops.	*LOOK: Unit must stop.* *NOTE: If unit keeps moving forward but at a slower speed than before depressing clutch pedal, C1 clutch is "dragging".* *If unit continues to move with pedal depressed, depress brake pedal and observe engine rpm. A decrease in rpm also indicates excessive C1 clutch "drag" caused by warped plates and disks.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457BL 10T;9005 J632 090189
C2 CLUTCH "DRAG" CHECK		Operate unit on a hard surface. Run engine at slow idle. Operate unit in 2nd forward and turn full right or left. This provides a slight load to stop unit when clutch is depressed. Depress clutch pedal and observe unit as it stops.	*LOOK: Unit must stop.* *NOTE: If unit keeps moving forward but at a faster speed than before depressing clutch pedal, C2 clutch is "dragging".* *If unit continues to move with clutch pedal depressed, depress brake pedal and observe engine rpm. A decrease in rpm also indicates excessive C2 clutch "drag" caused by warped plates and disks.*	**OK:** To to next check **NOT OK:** See your John Deere dealer. 029;T6457BO 10T;9005 J633 110189

DIFFERENTIAL LOCK CHECKS		Run engine at slow idle. Activate differential lock. (Press pedal forward.) Release differential lock pedal.	*LOOK: Pedal must remain on after depressing pedal and return against the stop when released.* *LISTEN: Only a slight decrease in engine speed when pedal is depressed.* *LOOK: Differential lock indicator light (in monitor panel) must be on.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457CK 10T;9005 J634 090189
DIFFERENTIAL LOCK SLIPPAGE CHECK **▲ CAUTION: Machine may move. Be sure area is clear.**		Use blade to raise rear wheels on one side. Apply differential lock. Depress clutch pedal and shift unit into 1st forward. Slowly release clutch pedal.	*LOOK: Raised wheels must not turn unless all rear wheels are turning.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457CK 10T;9005 J635 090189

⑧ HYDRAULIC SYSTEM CHECKS

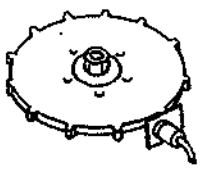
10T;9005 J123 180886

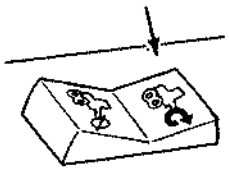
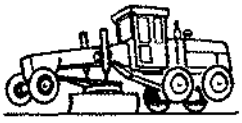
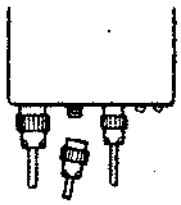
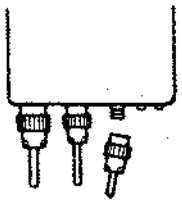
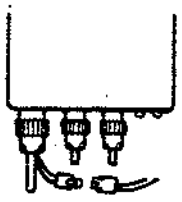
CONTROL VALVE CHECK		Start engine and run at slow idle. Activate all control levers while watching unit for movement.	*LOOK: Direction of travel indicated on the controls must correspond with equipment travel. Equipment travel should be continuous and smooth.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457CN 10T;9005 J637 090189
CONTROL VALVE FLOAT POSITION CHECK		Raise blade to about 250 mm (10 in.). Push left and right blade control levers into float positions. Repeat check using scarifier control (if equipped). Operation of float position is the same.	*LOOK: Control levers must remain in float. Blade must float to the ground and not lift the machine off the ground.* *LOOK: Control levers must remain in float position until manually moved.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457CO 10T;9005 J638 090189

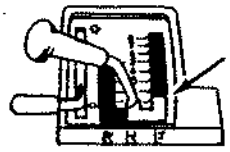
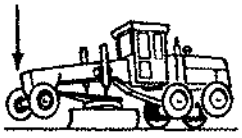
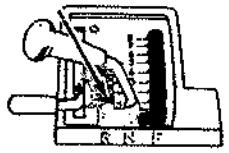
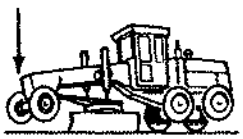
SADDLE LOCKING PIN CHECKS		Run engine at slow idle. Engage locking pin in all seven positions.	*LOOK: Pin must disengage and engage easily and completely. Blade lift cylinders must operate smoothly when positioning blade. Position indicator must point to correct mark for each position. Adjust pointer as needed.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 10T;9005 J639 090189
LOCKOUT POPPET AND CYLINDER LEAKAGE CHECK		Run engine at slow idle. Retract blade lift cylinders, then extend 5.0 in. (127 mm). Position blade tilt, circle sideshift, scarifier and ripper cylinders at mid stroke. Position wheel lean to maximum lean then return 25 mm (1 in.).	*LOOK: Cylinder drift should not exceed .06 in. (1.5 mm) in 15 minutes.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457CR 10T;9005 J640 090189
EQUIPMENT CYCLE TIMES Cylinders are cycled full stroke (except noted).	Run engine at fast idle. Hydraulic oil at normal operating temperature. Activate control lever while measuring cycle time.	*LOOK: Measure cycle times.* **Function ..... Time** Blade raise ..... 2.3 ± .5 sec 304 mm (12 in.) Blade lower ..... 2.8 ± .5 sec 305 mm (12 in.) Circle sideshift .. 5.5 ± .5 sec (either direction), Blade sideshift .... 9 ± 1 sec (either direction) Blade tilt ..... 3 ± .5 sec (either direction)	Circle rotate ..... 15 sec max (clockwise or counter clockwise 90°) Wheel lean ..... 2.5 ± .5 sec (right or left) Rear steer ..... 5.5 sec max (right or left) Scarifier down ... 3.8 ± .8 sec (without shanks) Scarifier up ..... 4.5 sec max (without shanks) Ripper down ..... 4 ± .5 sec (without shanks) Ripper up ..... 5 ± .5 sec (without shanks)	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 10T;9005 J641 090189

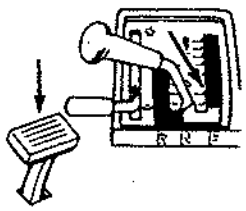
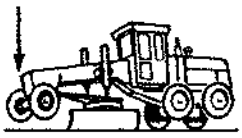
⑨ HYDRAULIC FRONT WHEEL DRIVE (HFWD) SYSTEM CHECKS (IF EQUIPPED) (Units Without Diagnostic Lights In Control Box)

10T;9005 J642 090189

REAR WHEEL SPEED SENSOR CHECK Inspect air gap (clearance) between tip of rear sensor and park brake disk teeth.		*LOOK: Air gap must be approximately 1 mm (0.04 in.) (thickness of a dime). If gap is less, check sensor tip for damage. If gap is more, you may lose front wheel drive in 1st gear.*	*NOTE: Rear sensor provides a signal to tell the control box how fast the rear wheels are turning. If rear sensor is not working, the front wheel drive will not work.*	**OK:** Go to next check **NOT OK:** Adjust gap or replace sensor. 029;T6457BM 10T;9005 J643 090189

ELECTRICAL COMPONENTS CHECK	Inspect wiring harness for damage. Check terminals for being loose, corroded, bent, or pushed back into connectors.	*NOTE: HFWD control box requires machine ground, +12 volts, and +24 volt connections. Machine ground and +12 volt connections are made at the right side battery. The +24 volt connection is made at the key switch.*	*LOOK: Bare wires, badly kinked or broken wires, or cut harness coverings can result in intermittent or no HFWD operation.*	**OK:** Go to next check **NOT OK:** Repair harness or connector. 10T;9005 J644 090189
HFWD CONTROLS CHECK		Turn key ON (engine off). Move HFWD switch forward to engaged position and gear selector lever to 1st gear. Move gear selector lever to 5th gear (7th gear for high speed HFWD).	*LISTEN: Control box must "click" when gear selector is moved into 1st and 5th gear (7th for high speed HFWD).*	**OK:** Go to next check **NOT OK:** Check 10 amp tuse (bottom left fuse in fuse block). **NOT OK:** See your John Deere dealer. 029;T6457BN 10T;9005 J645 090189
HFWD DRIVING TEST **IMPORTANT: Do not operate unit above 1st gear with one set of tandems off the ground. Damage to differential can result.**		Start engine, run at approximately 1500 rpm. Raise front wheels and one set of tandems off ground using blade and scarifier. Move gear selector to 1st forward. Move HFWD switch to ON.	*LOOK: HFWD charge pressure indicator must remain OFF.* *Front wheels must turn in the forward direction but at a slower speed than the rear wheels.*	**OK:** Go To next check **NOT OK:** See your John Deere Dealer. 029;T6457BP 10T;9005 J683 090189
FRONT SENSOR CHECK		With front wheels turning from previous check, remove center connector from bottom of HFWD control box. *LOOK: Speed of front wheels must increase to full speed.*	Reconnect center connector. *LOOK: Speed of front wheels must return to original speed.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457BQ 10T;9005 J646 090189
REAR SENSOR CHECK		With front wheels turning from previous check, remove front connector from bottom of HFWD control box. *LOOK: Front wheels must stop turning with connector removed.*	Reconnect front connector. *LOOK: Front wheels must return to original speed.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457BR 10T;9005 J647 090189
GAIN REDUCING RESISTOR CHECK		With front wheels turning from previous check, unplug connector (2-way connector located next to large military connector at bottom of HFWD control box). *LOOK: Front wheels must speed up then return to original speed.*	Reconnect 2-way connector. *LOOK: Front wheels must slow down then return to original speed.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457BS 10T;9005 J648 090189

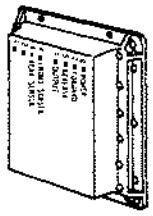
AGGRESSIVENESS SWITCH CHECK		With front wheels turning from previous check, move switch to the aggressive position (forward). *LOOK: Front wheels must increase in speed momentarily and then slow to approximately the original speed.*	*NOTE: Rear wheels speed will not change.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457BT 10T;9005 J649 090189
HFWD PULLING TORQUE CHECK (FORWARD) **⚠ CAUTION: Unit may move when wheels contact ground. Keep area around unit clear.**	 	Run engine at approximately 1500 rpm. With front wheels and one set of tandem off ground, move gear shift lever to 1st forward. Slowly lower front wheels to ground then raise off ground.	*LOOK/LISTEN: On contact with ground, both wheels must develop torque and hydraulic lines will "whine".*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457B0, T6457BP1 10T;9005 J650 090189
HFWD PULLING TORQUE CHECK (REVERSE) **⚠ CAUTION: Unit may move when wheels contact ground. Keep area around unit clear.**	 	Run engine at approximately 1500 rpm. With front wheels and one set of tandems off ground, move gear shift lever to 1st reverse. Slowly lower front wheels to ground then raise off ground.	*LOOK/LISTEN: On contact with ground, both wheels must develop torque and hydraulic lines will "whine".*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457BG1, T6457BP1 10T;9005 J651 090189

CLUTCH PRESSURE SWITCH CHECK **⚠ CAUTION: Unit may move when wheels contact ground. Keep area around unit clear.**	 	Run engine at approximately 1500 rpm. With front wheels and one set of tandems off ground, move gear shift lever to 1st forward. Slowly lower front wheels to ground. When torque develops, slowly depress clutch pedal.	*LOOK: Front wheels must develop torque and stop turning immediately when clutch is disengaged.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer.

029;T6457CJ, T6457BP1 10T;9005 J652 090189

10 HYDRAULIC FRDNT WHEEL DRIVE (HFWD) SYSTEM CHECKS (IF EQUIPPED) (Units With Diagnostic Lights In Control Box)

10T;9005 J653 110189

CONTROL BOX BULB CHECK AND POWER CHECK	Turn HFWD control box to OFF. Turn key switch to ON without starting engine.	*LOOK: All lights on control box must come on for 1 second and then all except the Power light must go out.* *NOTE: The Power light should be on whenever key switch is in the ON position.* *NOTE: Some lights will stay on after the bulb check if the HFWD control box is turned on before the key is turned on.*		**OK:** Go to next check. **NOT OK:** If no lights come on, check HFWD fuse. **NOT OK:** See your John Deere dealer.

029;T6929BG 10T;9005 J654 090189

HFWD CONTROL BOX AGGRESSIVE SWITCH CHECK (ENGINE OFF)

Turn HFWD control box on.

Turn key switch on.

NOTE: Control box must be turned on before key switch for this check.

Turn aggressive switch to the full counterclockwise position and observe control box indicator light numbers 1—4.

Turn aggressive switch clockwise one position at a time while observing indicator lights.

LOOK: All indicator lights must come on for 1 second and then the following indicator lights must come on in each switch postion. ("X" indicates the lights that are turned on.)

The switch positions are numbered 1—15 from full counterclockwise.

NOTE: Some lights will also be on in light numbers 5—8.

POSITION	Light No. 1	2	3	4
1	X			
2				X
3	X			X
4				X
5	X			X
6			X	X
7	X		X	X
8				X
9	X			X
10		X		X
11	X	X		X
12			X	X
13	X		X	X
14		X	X	X
15	X	X	X	X

OK: Switch and switch wiring are good. Go to next check.

NOT OK: See your John Deere dealer.

10T;9005 J655 110189

HFWD CONTROL BOX MODEL PLUG CHECK (ENGINE OFF)

NOTE: Model plug is located in right side console.

Turn HFWD control box on.

Turn key switch on.

NOTE: Control box must be turned on before key switch for this check.

LOOK: All indicator lights must come on for 1 second and then the following indicator lights must come on in light numbers 5—7. ("X" indicates the lights that are turned on).

These lights indicate which model plug is installed in harness.

NOTE: Std. is standard speed and H.S. is high speed in chart.

NOTE: Some lights will also be on in the either light positions.

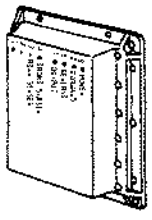
MODEL	Light No. 5	6	7
672B-Std			
672B-HS	X		
772B-Std			X
772B-HS	X		X
772BH Std		X	
772BH-HS	X	X	

OK: Go to next check

NOT OK: See your John Deere dealer.

10T;9005 J656 110189

FORWARD CAM SWITCH CHECK



Turn key switch on.

LOOK: All lights in control box must come on for 1 second and then go out except for the Power light.

Turn HFWD switch on.

Move gear selector to 1st forward.

LOOK: Forward light must come on indicating that the forward cam switch is closed.

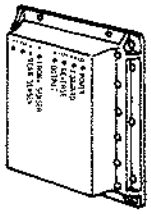
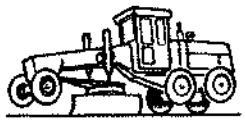
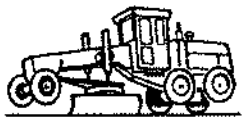
Move gear selector to 5th forward (Standard speed) or 7th forward (high speed front wheel drive).

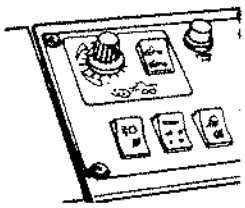
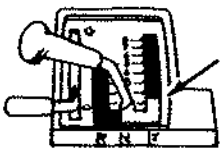
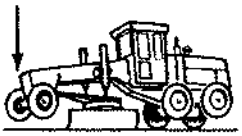
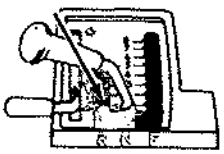
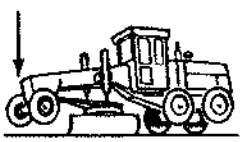
LOOK: Forward light must go out.

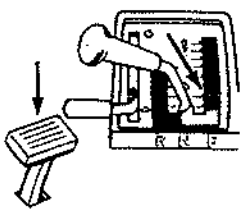
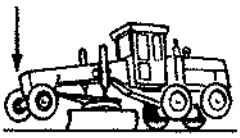
OK: Go to next check.

NOT OK: See your John Deere dealer.

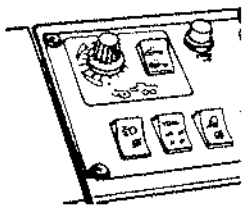
029;T6929BG 10T;9005 J659 110189

REVERSE CAM SWITCH CHECK		Turn key switch on. *LOOK: All lights in control box must come on for 1 second and then go out except for the Power light.* *Turn HFWD switch on.*	Move gear selector to 1st, 2nd, 3rd, and 4th reverse. *LOOK: Reverse light must come on indicating that the reverse cam switch is closed.*	**OK:** Go to next check. **NOT OK:** See your John Deere dealer. 029;T6929BG 10T;9005 J660 090189
HFWD FORWARD OPERATING CHECK **IMPORTANT: Do not operate unit above 1st gear with one set of tandems off the ground. Damage to differential can result.**		Start engine, run at approximately 1500 rpm. Raise front wheels and one set of tandems off ground using blade and scarifier. Move gear selector to 1st forward. Move HFWD switch to ON.	*LOOK: HFWD charge pressure indicator must remain OFF.* Front wheels must turn in the forward direction but at a slower speed than the rear wheels. The following indicator lights on control box must be on: Power Forward Output Front Sensor Rear Sensor All other indicators must be off. *NOTE: If one of the indicator lights listed does not come on, a malfunction is indicated in that circuit.* 029;T6457BP 10T;9005 J657 110189	**OK:** Go to next check **NOT OK:** See your John Deere dealer.
HFWD REVERSE OPERATING CHECK **IMPORTANT: Do not operate unit above 1st gear with one set of tandems off the ground. Damage to differential can result.**		Start engine, run at approximately 1500 rpm. Raise front wheels and one set of tandems off ground using blade and scarifier. Move gear selector to 1st reverse. Move HFWD switch to ON.	*LOOK: HFWD charge pressure indicator must remain OFF.* Front wheels must turn in the reverse direction but at a slower speed than the rear wheels. The following indicator lights on control box must be on: Power Reverse Output Front Sensor Rear Sensor All other indicators must be off. *NOTE: If one of the indicator lights listed does not come on, a malfunction is indicated in that circuit.* 029;T6457BP 10T;9005 J658 110189	**OK:** Go to next check **NOT OK:** See your John Deere dealer.

AGGRESSIVENESS SWITCH CHECK (ENGINE RUNNING) *NOTE: The center position of the aggressive switch sets the front wheel speed to 100% of the rear wheel speed. Each position of the switch changes the front wheel speed by 0.5%.*		With the front wheels turning from the previous check, turn aggressive switch one position at a time in the clockwise direction.	*LOOK: Front wheels must increase in speed momentarily and then slow to approximately the original speed.* Turn aggressive switch one position at a time in the counter clockwise direction. *LOOK: Front wheels must slow down momentarily and then increase to approximately the original speed.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer.
				029;T6929BF 10T;9005 J661 110189
HFWD PULLING TORQUE CHECK (FORWARD) **⚠ CAUTION: Unit may move when wheels contact ground. Keep area around unit clear.**	 	Run engine at approximately 1500 rpm. With front wheels and one set of tandem off ground, move gear shift lever to 1st forward. Slowly lower front wheels to ground then raise off ground.	*LOOK/LISTEN: On contact with ground, both wheels must develop torque and hydraulic lines will "whine".*	**OK:** Go to next check **NOT OK:** See your John Deere dealer.
				029;T6457BO, T6457BP1 10T;9005 J662 090189
HFWD PULLING TORQUE CHECK (REVERSE) **⚠ CAUTION: Unit may move when wheels contact ground. Keep area around unit clear.**	 	Run engine at approximately 1500 rpm. With front wheels and one set of tandems off ground, move gear shift lever to 1st reverse. Slowly lower front wheels to ground then raise off ground.	*LOOK/LISTEN: On contact with ground, both wheels must develop torque and hydraulic lines will "whine".*	**OK:** Go to next check **NOT OK:** See your John Deere dealer.
				029;T6457BG1, T6457BP1 10T;9005 J663 090189

CLUTCH PRESSURE CAM SWITCH CHECK **⚠ CAUTION: Unit may move when wheels contact ground. Keep area around unit clear.**	 	Run engine at approximately 1500 rpm. With front wheels and one set of tandems off ground, move gear shift lever to 1st forward. Slowly lower front wheels to ground. When torque develops, slowly depress clutch pedal.	*LOOK: Front wheels must develop torque and stop turning immediately when clutch is disengaged.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer.

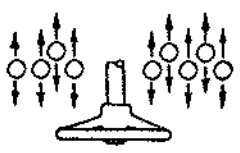
029;T6457CJ, 16457BP1 10T;9005 J664 110189

POTENTIOMETER ADJUSTMENT CHECK		Operate unit on a hard surfaced road in 4th forward with the engine at half speed. Turn the HFWD control switch to ON. Turn aggressive switch to the full counter clockwise position. Note sound of engine and hydrostatic pump. Turn aggressive switch to the center position in one motion.	*LISTEN: Engine load an hydrostatic whine must increase for a few seconds and then return to the original sound.* Turn aggressive switch from the center position to the full clockwise position. *LISTEN: Engine load and hydrostatic whine must increase for a few seconds and then reduce to a level that is higher than the original.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer.

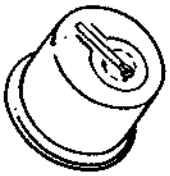
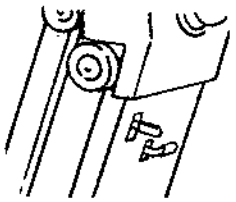
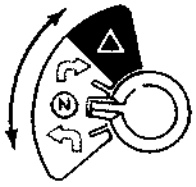
029;T6929BF 10T;9005 J665 110189

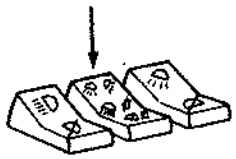
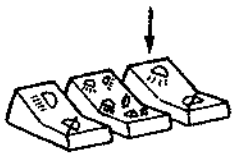
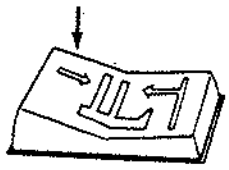
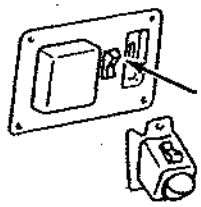
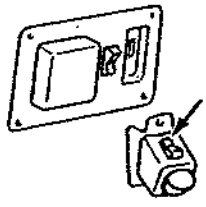
11 CAB COMPONENT CHECK

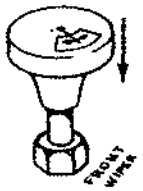
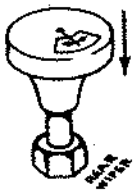
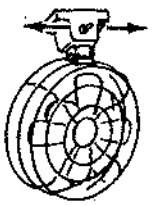
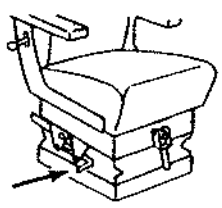
10T;9005 J666 110189

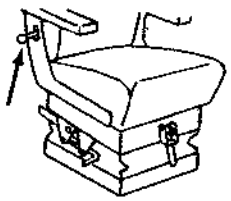
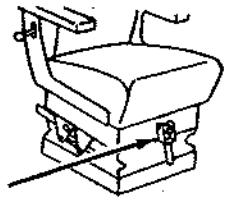
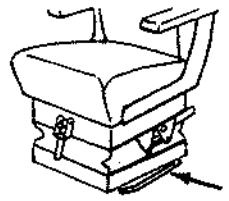
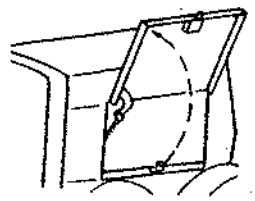
HYDRAULIC CONTROL LEVERS LINKAGE CHECK		Lower equipment to ground. Stop engine. Move each hydraulic control lever through its full travel.	*FEEL: Levers must return to neutral when released. Left and right blade lift and scarifier valve have a float position. When positioned fully forward, these levers must remain in float detent until manually removed.*	**OK:** Go to next check **NOT OK:** Check for binding or misadjusted linkage. Repair or replace valve section.

029;T6457CN 10T;9005 J201 090189

START AID CHECK (IF EQUIPPED)		With engine running at slow idle, push start aid button momentarily. Listen to engine rpm.	*LISTEN: Engine rpm must increase when start aid is pressed.*	**OK:** Go to next check **NOT OK:** If engine rpm does not increase, the start aid solenoid may have failed, start aid can may not be positioned correctly or the start aid can may be empty. 029;T6457CS 10T;9005 J186 090189
TILT PEDESTAL POSITION LOCK CHECKS		Lower equipment to ground. Stop engine. Raise left lever to tilt steering wheel. Release lever to lock wheel in any of five positions. Raise right lever to move pedestal forward or backward.	Release lever to lock pedestal in any of five positions. *LOOK: Left and right lock levers must move freely and return to lock position when released. Pedestal moves forward and rearward easily. Steering wheel tilts easily.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457BU 10T;9005 J668 090189
TURN SIGNAL SWITCH CHECKS		Rotate switch clockwise and counterclockwise. *FEEL: Detent in all positions. Switch rotates easily and remains in any selected position.* *NOTE: Indicators on monitor will flash only with key ON.*	*LOOK: Left turn-left front amber, left rear red and amber lights flash. Right turn-right front amber, right rear red and amber lights flash. Warning lights-Two front amber, two rear amber, and two rear red lights flash.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457BV 10T;9005 J669 090189
HORN SWITCH CHECK		Turn key OFF. Push horn button. *LOOK: Button must push in easily and come back out.*	*LISTEN: Horn must sound.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457BW 10T;9005 J670 090189
WORK LIGHT SWITCH CHECK		Lower equipment to ground. Stop engine. Turn key to ACC. Push upper half of left rocker switch.	*LOOK: Two white lights mounted near the front wheels (driving lights) and two red tail lights in the rear grille come on.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457BX 10T;9005 J671 090189

		Push upper half of middle rocker switch down one position. *LOOK: Two white lights (front work lights) mounted on center of front frame come on.*	Push switch down two positions. *LOOK: Two front work lights and two rear white lights mounted in grille must come on.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457BX1 10T;9005 J672 090189
		Push upper half of right rocker switch.	*LOOK: Two white lights mounted under front corners of cab floor come on.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457BX2 10T;9005 J673 090189
RIPPER SWITCH CHECK		Lower blade and any front-mounted equipment to ground. Stop engine. Turn key to ACC. Push front (left side) of rocker switch.	*LOOK: Ripper must lower to ground.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457C1 10T;9005 J674 090189
CAB INTERIOR LIGHTS CHECK		Stop engine. Turn key OFF Push top half of rocker switch (located above front windshield).	*LOOK: Light must come on.*	**OK: Go to next check** **NOT OK:** See your John Deere dealer. 029;T6457BY 10T;9005 J675 090189
		Push top half of side console light (above side console).	*LOOK: Light must come on.*	**OK:** Go to next check **NOT OK:** If console light fails to come on, turn on driving lights. If these lights come on, fuse is OK. **GO TO:** Driving /Tail Light Circuit Check in Group 9015-10. 029;T6457BY1 10T;9005 J676 090189
FRONT WINDSHIELD WASHER AND WIPER CHECKS		Stop engine and turn key OFF. Turn front wiper control knob clockwise to first position. *LOOK: Wiper must operate at a rate of one cycle per second.*	Turn knob to second position. *LOOK: Wiper must operate at a rate of about two cycles per second.* *Wiper blade must "park" on right side of windshield when knob is OFF.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457BZ 10T;9005 J677 090189

		Depress front windshield wiper knob.	*LISTEN: Washer pump motor operates.* *LOOK: Fluid squirts from nozzle mounted on wiper blade.*	**OK:** Go to next check **NOT OK:** See your John Deere dealer. 029;T6457BZ1 10T;9005 J678 090189
REAR WINDSHIELD WIPER AND WASHER CHECKS		Stop engine. Turn key ON. Turn rear wiper control knob clockwise to first position. *LOOK: Rear wiper must operate.*	*NOTE: Rear wiper switch has a low and high speed position but the motor only has one speed.* *LOOK: Rear wiper has no "park" position. It will stop wherever it is when switch is turned OFF.*	**OK:** Go to next check **NOT OK:** If wiper does not operate, depress rear wiper switch knob to activate rear windshield washer. If washer operates, fuse is OK. **NOT OK:** If wiper does not operate, check switch on motor. 029;T6457CA 10T;9005 J684 090189
		Depress rear windshield wiper knob.	*LISTEN: Washer pump motor must operate.* *LOOK: Fluid must squirt from nozzle mounted on wiper blade.*	**OK: Go to next check.** **NOT OK:** See your John Deere dealer. 029;T6457CA1 10T;9005 J679 090189
DEFROSTER FAN CHECKS		Key switch ON. Move defroster fan switch to the right. *LOOK: Fan must run in low speed.*	Move switch to the left. *LOOK: Fan must run in high speed.* *NOTE: Center position is the OFF position.*	**OK:** Go to next check. **NOT OK:** See your John Deere dealer. 029;T6457CB 10T;9005 J680 090189
HOUR METER CHECKS *NOTE: Hour meter is located on the right side of the engine.*		Turn key ON. Start engine.	*LOOK: Hour meter counter must advance every 6 minutes. A rotation indicator moves all the time.*	**OK:** Go to next check. **NOT OK:** See your John Deere dealer. 029;T6457CH 10T;9005 J681 090189
SEAT ADJUSTMENT CHECKS		Push seat height adjusting lever down. Release lever to lock seat at desired height.	*FEEL: Seat height must be adjustable and lock in any position.*	**OK:** Go to next check. **NOT OK:** Lubricate or repair as necessary. 029;T6457C0 10T;9005 L60 090189

		Raise knob up to tilt seat back rearward. Lower knob to tilt seat back forward.	*FEEL: Seat back must adjust forward and rearward and remain in position.*	**OK:** Go to next check. **NOT OK:** Lubricate or repair as necessary. 029;T6457CE, 10T;9005 L61 090189
		Turn weight adjusting lever clockwise for firm ride; counterclockwise for soft ride.	*FEEL: Weight adjustment crank must adjust seat for ride.*	**OK:** Go to next check. **NOT OK:** Lubricate or repair as necessary. 029;T6457CF 10T;9005 L62 090189
		Move lever to the left to unlock slide rails. Slide seat forward and rearward. Release lever to lock seat in place.	*FEEL: Seat must move forward and rearward and lock in all positions.*	**OK:** Go to next check. **NOT OK:** Lubricate or repair as necessary. 029;T6457CG 10T;9005 L63 090189
SIDE SHIELD CHECKS		Open and close all side shields and access doors. Open engine side shields to full vertical. Push hold-open latches behind hinges to close shields.	*FEEL: Latches must operate easily and hold doors closed when latched. Side shields and access doors must swing freely. Engine side shields must be held open by latches. Latches must move easily to allow side shields to close.*	**OK:** Go to next check. **NOT OK:** Adjust as necessary. 029;T6457CI 10T;9005 L64 090189

Troubleshooting

NOTE: Troubleshooting charts are arranged from the simplest to verify, to least likely, more difficult to verify. When diagnosing a problem, use all possible means to isolate the problem to a single component or system. Use the following steps to diagnose problems:
Step 1. Operational Checkout Procedure.
Step 2. Troubleshooting charts.
Step 3. Adjustments.
Step 4. See your John Deere dealer.

ENGINE

Symptom	Problem	Solution
Engine Cranks But Will Not Start Or Starts Hard	Fuel tank empty.	Check fuel level visually.
	Fuel shut-off valve closed.	Open valve.
	Water in fuel or water frozen in fuel lines. Water frozen in fuel filter.	Thaw and/or drain water from fuel tank sump. Thaw ice in fuel lines and drain. Install new fuel filter.
	Fuel shut-off cable or linkage improperly adjusted or damaged.	Adjust cable and/or linkage. Repair cable and/or linkage.
	Fuel tank cap vent plugged.	Remove cap, listen for air entering tank suddenly. Replace cap.
	Debris or dirt in fuel.	Drain small amount of fuel from tank sump into clean container. Inspect for debris. Drain and flush fuel system. Change fuel filter.
	Wrong grade fuel for low ambient temperature.	Fuel "jelled" in tank or lines. Warm machine. Drain fuel system. Change fuel filter. Refill with proper fuel.
	Air entering suction side of fuel system.	Check for bubbles in fuel filter. Tighten connections. Inspect lines for damage.
	Fuel transfer pump malfunctioning.	Repair or replace pump. See your John Deere dealer.
	Air filter elements restricted with dirt, snow, or water.	Clean or replace filter elements.

Continued on next page

Symptom	Problem	Solution
Engine Cranks But Will Not Start Or Starts Hard—Continued	Injection pump malfunction.	See your John Deere dealer.
	Injection nozzle(s) malfunction.	See your John Deere dealer.
	Worn piston rings or low compression.	See your John Deere dealer.
	Blown head gasket.	See your John Deere dealer.
Engine Cranks Slowly	Wrong weight oil for low ambient temperature.	Drain and refill with proper weight oil. Change oil filter.
	Poor or dirty connections at at batteries or starter	Clean battery posts and cable ends. Reinstall cables. Clean connections at start relay and starter.
	Batteries discharged or failing to take charge.	Disconnect batteries from machine and each other. Recharge separately. Replace both batteries if either fails to charge. Check alternator output (28 volts). Check wiring for shorting to ground. Check alternator belt tension.
	Hydraulic pump destroke valve stuck.	Turn manual destroke screw all the way in (clockwise). Crank engine. If cranking speed is normal, see your John Deere dealer for stroke control valve repair.
	Starter motor malfunction.	Seized bushings, bent armature shaft, worn bushings, armature "dragging". Check starter current draw. See your John Deere dealer for starter repair.
Engine Surges or Stalls Frequently	Air entering suction side of fuel system.	Check fuel filter for air bubbles. Tighten fittings and connections. Inspect lines for damage.
	Fuel tank cap vent plugged.	Remove cap, listen for air entering tank suddenly. Replace cap.
	Water or debris in fuel.	Drain water from sump in fuel tank. Check drained fuel for debris. Drain and flush fuel system. Replace fuel filter.

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Symptom	Problem	Solution
Engine Surges or Stalls Frequently—Continued	Fuel "jelled" due to low ambient temperatures.	Drain fuel system. Refill with proper grade fuel. Replace fuel filter.
	Fuel filter plugged.	Replace filter. Check for debris in fuel system.
	Return line from injection pump to tank restricted.	Check line for kinks or damage. Check line for debris. Clean with compressed air.
	Air filter elements plugged.	Clean or replace elements.
	Fuel transfer pump plugged.	Repair or replace pump. See your John Deere dealer.
	Injection pump or nozzle(s) malfunctioning.	See your John Deere dealer.
	Basic engine malfunction.	Leaking head gasket. Sticking or burnt valves. Valve clearance incorrect. Adjust. Incorrect valve timing. Worn or broken piston rings. See your John Deere dealer.
Engine Missing, Erratic Operation Or Poor Slow Speed Operation	Air entering suction side of fuel system.	Check fuel filter for air bubbles. Tighten fittings. Inspect lines for damage.
	Water or debris in fuel.	Drain water from fuel tank sump. Drain and flush fuel tank to remove debris.
	Fuel tank cap vent plugged.	Remove cap. Listen for air entering tank suddenly. Replace cap.
	Return line from injection pump to tank restricted.	Inspect lines for kinks or damage. Use compressed air to clear debris.
	Slow idle speed set too low.	Check for bent, worn or loose speed control linkage. Repair as needed. Adjust linkage and reset slow idle.
	Fuel transfer pump malfunctioning.	Repair or replace pump. See your John Deere dealer.

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Symptom	Problem	Solution
Engine Missing, Erratic Operation Or Poor Slow Speed Operation—Continued	Injection pump or nozzles malfunctioning.	Repair or replace. See your John Deere dealer.
	Incorrect valve clearance.	Adjust clearance.
	Basic engine malfunction.	Leaking head gasket. Sticking or burnt valves. Valve clearance incorrect. Adjust. Incorrect valve timing. Worn or broken piston rings. See your John Deere dealer.
Engine Not Developing Full Power	Fuel filter plugged.	Replace filter.
	Air filter elements plugged.	Clean or replace elements.
	Water in fuel or wrong grade of fuel.	Drain water from fuel tank sump or drain and refill with proper fuel.
	Exhaust system restriction.	Check condition of muffler interior.
	Fast idle speed too low.	Adjust. Check for worn or damaged linkage.
	Incorrect valve clearance.	Adjust clearance.
	Fuel line restriction or injection pump line restricted.	Clear restriction with compressed air. Replace line.
	Park brake dragging.	Adjust linkage. Check park brake disc for warpage or scoring. Check park brake cable for binding. Overheating park brake disc indicates dragging.
	Service brakes dragging.	Check brake linkage, brake valve leakage, brake discs for warpage or scoring. Dragging brakes could cause overheating transmission/ hydraulics, or engine.
	Fuel shut-off cable binding or linkage out of adjustment	Free cable or replace. Check linkage for worn or damaged parts. Adjust linkage.
	Fuel transfer pump malfunctioning.	Repair or replace pump. See your John Deere dealer.

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Symptom	Problem	Solution
Engine Not Developing Full Power—Continued	Injection pump or nozzle malfunction	Repair or replace pump or nozzles. See your John Deere dealer.
	Internal hydraulic system leakage	Repair linkage. See your John Deere dealer.
	Turbocharger failure. Turbocharger gasket leak.	Repair or replace. See your John Deere dealer.
	Basic engine malfunction.	Leaking heat gasket. Sticking or burnt valves. Valve clearance incorrect. Adjust. Incorrect valve timing. Worn or broken piston rings. See your John Deere dealer.
Engine Emits Excessive Black or Gray Exhaust Smoke	Restricted air filter element.	Check. Clean or replace elements.
	Incorrect grade of fuel.	Drain and refill.
	Engine overloaded.	Remove load. Run at fast idle to clear engine.
	Turbocharger failure. Turbocharger gasket failure.	Repair or replace. See your John dealer.
	Incorrect injection pump timing.	Repair or replace pump or nozzles.
	Excessive fuel delivery. Injection pump malfunction. Injection nozzle malfunction.	See your John Deere dealer.
Excessive Blue or White Exhaust Smoke	Engine will not start.	Cranking speed too slow.
	Engine running. Incorrect grade of fuel.	Drain and refill.
	Injection pump or nozzle malfunction.	Repair or replace. See your John Deere dealer.
	Excessive engine idling.	Run at fast idle to clear.
	Basic engine malfunction (excessive oil consumption)	Repair. See your John Deere dealer.

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Symptom	Problem	Solution
Detonation (Excessive Engine Knock)	Stuck starting aid solenoid. Stuck starting aid switch.	Repair or replace solenoid or switch.
	Injection pump timing or pump advance faulty.	Repair or replace pump.
	Improper fuel (gasoline mixed with diesel fuel).	Drain and refill fuel tank. Replace fuel filter.
Abnormal Engine Noise (Rattle, Knock or Squeal)	Low engine oil level.	Fill to correct level.
	Too light weight engine oil for high ambient temperatures.	Drain and refill with correct weight oil.
	Fuel in engine oil.	Drain and refill with proper oil. Check fuel system to find leakage.
	Loose or worn hydraulic pump drive coupling, or pump failure.	Repair or replace.
	Incorrect injection pump timing.	Adjust timing. See your John Deere dealer.
	Turbocharger bearing or turbine failure.	Remove turbo air inlet hose check shaft vertical movement. Repair or replace. See your John Deere dealer.
	Excessive valve clearance.	Adjust clearance.
	Internal engine component wear.	Repair. See your John Deere dealer.
Low Engine Oil Pressure (Oil Pressure Indicator Light On, Red STOP Light Flashing and Alarm Pulsing)	Low oil level.	Check oil level. Fill to correct level. Check for leaks. Repair leaks.
	Low viscosity using winter oil in summer.	Drain and fill with summer weight oil.
	Oil diluted with fuel.	Drain and fill with proper weight oil. Check fuel system for leakage. Repair.

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Symptom	Problem	Solution
Low Engine Oil Pressure (Oil Pressure Indicator Light On, Red STOP Light Flashing and Alarm Pulsing)—Continued	Oil pressure sensor failure.	Replace sensor.
	Faulty oil pressure control valve.	Repair valve. See your John Deere dealer.
	Plugged oil pump intake screen.	See your John Deere dealer.
	Loose oil pump drive gear or worn pump housing.	See your John Deere dealer.
	Internal engine component wear or failure.	See your John Deere dealer.
Engine Overheats	Low coolant level.	Fill to correct level and check for leaks.
	Loose, worn or broken fan belt.	Tighten or replace belt.
	Worn pulley grooves allowing belt slippage.	Replace pulleys and belt.
	Radiator dirty or plugged.	Check air flow. Clean radiator. Recheck air flow.
	Radiator shroud missing or damaged.	Replace shroud.
	Engine overloaded.	Reduce load. Operate in lower gear.
	Radiator cap not sealing.	Replace cap.
	Fan on backwards or damaged.	Inspect or replace fan.
	Faulty sender or wires from sender damaged.	Replace sender. Inspect wires. Repair as needed.
	Incorrect injection pump timing.	Repair. See your John Deere dealer.
	Excessive brake drag.	Repair. See your John Deere dealer.

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Symptom	Problem	Solution
Engine Overheats (Continue)	Hydraulic system overheating due to internal leakage.	Check hydraulic oil level, cooler for being plugged. See your John Deere dealer.
	Thermostats stuck or missing.	Replace thermostats.
	Cooling system interior coated with lime deposits.	Flush cooling system with cleaner. Refill with water/antifreeze solution.
	Water pump leaking.	Repair or replace water pump.
	Excessive fuel delivery/ injection pump malfunction.	Adjust or repair. See your John Deere dealer.
Oil In Coolant Or Coolant In Oil	Leaking cylinder head gasket or liner packings. Cracked cylinder or block.	Repair. See your John Deere dealer.
Excessive Fuel Consumption	Air system restricted.	Clean or replace filter elements.
	Fuel system leakage.	Repair.
	Incorrect grade of fuel.	Drain and fill with proper fuel.
	Internal leakage in hydraulic system.	Repair. See your John Deere dealer.

ELECTRICAL SYSTEM

Symptom	Problem	Solution
Starting Motor Will Not Turn	Batteries undercharged or dead.	Disconnect batteries and charge separately. Replace both batteries if one has failed.
	Battery cables making poor connections.	Clean connections at battery and starter solenoid. Check for 24 volts at large starter solenoid terminal.
	Starter motor failure.	Listen for starter solenoid to "click" as key is turned to start. If "click" is heard, starter motor maybe failed. Repair.
	Starter solenoid failure.	Check for 24 volts on small solenoid terminal as key is turned to start. If 24 volts is present, replace solenoid.
	Start relay failure.	Listen for start relay to "click" as key is turned to start. If no "click" is heard, relay or wiring needs repair or replacement.
	Start system circuit breaker failure.	Measure 24 volts on each terminal. If no voltage is measured on either terminal, inspect wiring. If 24 volts is measured on one terminal, circuit breaker is failed. Replace.
	Key switch failure.	Check for 24 volts at key switch "St" terminal with key in "start" position.
	Neutral start switch failure.	Replace switch. See your John Deere dealer.
	Transmission linkage misadjusted or damaged; not activating neutral start switch.	Adjust or repair linkage. See your John Deere dealer.

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Symptom	Problem	Solution
Starting Motor Will Not Turn—Continued	Starter motor pinion "jammed" in flywheel gear.	See your John Deere dealer.
	Major engine failure.	See your John Deere dealer.
Starter Solenoid Chatters	Poor connections at batteries or starter.	Clean connections.
	Batteries discharged.	Recharge or replace batteries.
	Defective start solenoid (open "hold in" winding)	See your John Deere dealer
Starter Motor Turns But Will Not Crank Engine	Starter pinion gear not engaging flywheel ring gear.	Pinion shift mechanism "jammed" or malfunctioning. See your John Deere dealer.
	Pinion gear teeth broken.	Repair starter. See your John Deere dealer.
	Flywheel gear teeth broken.	Repair. See your John Deere dealer.
Engine Cranks Slowly	Batteries discharged or will not hold a charge.	Recharge or replace both batteries.
	Battery or starter cable connections loose or corroded.	Clean and tighten connections.
	Battery cables damaged or broken internally.	Inspect and replace cables.
	Starter "dragging".	Repair starter. See your John Deere dealer.
Starter Motor Continues To Run After Engine Starts	Starter solenoid stuck.	Gently tap solenoid. Repair solenoid. See your John Deere dealer.
	Starter relay stuck.	Gently tap relay. Replace relay. See your John Deere dealer.

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Symptom	Problem	Solution
Low Battery Output—Continued	Corroded or loose battery cable ends.	Clean and tighten cable end clamps. Recharge batteries separately.
	Broken or loose battery posts.	Wiggle posts by hand. If posts are loose or will turn, replace both batteries.
	Loose fan/alternator belt or worn pulleys.	Belt is slipping. Adjust or replace belt. Replace pulleys if needed.
	Low alternator output.	Inspect charging system and repair. See your John Deere dealer.
Alternator Volts Indicator And Yellow Warning Light Come On Or Stay On When Engine is Running	Alternator or regulator failure.	Check 24-volt output from alternator and regulator. See your John Deere dealer.
High Charging System Voltage (Batteries Hot or Boiling)	Alternator or regulator malfunction.	See your John Deere dealer.
Noisy Alternator	Failed or rough bearings in alternator.	Remove alternator belts. Turn pulley by hand. If any roughness if felt, replace bearings.
	Worn drive belt.	Inspect and replace.
	Pulley misalignment.	Adjust alternator mount.
	Internal alternator failure.	Replace. See your John Deere dealer.

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Symptom	Problem	Solution
Horn Will Not Sound	Horn fuse failure.	(Horn and flashers use same fuse.) Try flashers. Replace fuse.
	Horn ground connection poor.	Clean connector and frame. See Group 9015-25.
	Horn wire or connection.	**Repair wire. Clean and** tighten connection. See Group 9015-25.
	Horn failure.	Replace horn.
Front Wiper Will Not Operate At Any Switch Position	Wiper fuse failed.	Replace fuse.
	Red wire (P11) from fuse to front wiper switch failed (open).	0 volts at switch. Repair wires. See Group 9015-25.
	Switch failed.	With wiper switch in high and/or low positions, 0 volts on wires (A01, A02, and A03) at switch. Replace switch.
	Orange wires (A01, A02, and A03) from switch to motor failed (open).	With wiper switch in high and/or low positions, 0 volts on orange wires (A01, A02, and A03) at motor. Repair wires. See Group 9015-25.
	Failed wiper motor.	With wiper switch in high position 24 volts on orange wire (A01, A02, or A03). Replace motor.
Front Windshield Wiper Operates In One Position Only	One orange wire (A01, A02, or A03) failed from switch to motor.	0 volts on one wire with switch in any position. Repair wire. See Group 9015-25.
	Failed wiper motor (one winding).	Replace motor.
Rear Wiper Will Not Operate (Rear Wiper Switch Has Two Positions. Motor Has Only One Speed)	Wiper fuse failed.	Replace fuse.
	Red wire (P08) from fuse to switch failed.	0 volts on red wire (P08) at switch. Repair wire. See Group 9015-25.
	Switch failed.	0 volts on orange wire (A04) at switch. Replace switch.
	Orange wire (A04 or A05) from switch to motor failed. See	0 volts on orange wire (A04 or A05). Repair wire. See Group 9015-25.
	Failed wiper motor.	Replace motor.

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Symptom	Problem	Solution
Front Washer Will Not Operate	Wiper/washer fuse failed.	Replace fuse.
	Red wire (P11) failed open.	24 volts on red wire (P11) at switch. Repair wire.
	Switch failed.	24 volts on orange wire (A12) at switch when switch button pushed. Replace switch.
	Orange wire (A12) from switch to washer failed open.	0 volts on orange wire (A12) at washer when switch button pushed. Repair wire.
	Black wire (G21) failed open or pump ground connection.	If 24 volts is indicated on G21 at pump. Repair wire or ground connection.
	Washer pump failed.	24 volts at orange wire (A12) at pump. Ground wire is O.K. Replace pump.
Rear Washer Will Not Operate	Wiper/washer fuse failed.	Replace fuse.
	Red wire (P08) failed open from fuse to switch.	0 volts on red wire (P08) at switch when switch button pushed. Repair wire.
	Switch failed.	0 volts on orange wire (A11) at switch when switch button pushed. Replace switch.
	Orange wire (A11) from switch to washer failed open.	0 volts on orange wire (A11) at washer when switch button pushed. Repair wire.
	Blade wire (G21A) failed open or poor ground connection.	If 24 volts is indicated on G21A at pump. Repair wire or ground connection.
	Washer pump failed.	24 volts on orange wire (A11) at pump when switch button pushed. Replace pump.
Driving Lights Will Not Operate (Two White Lights Near Front Tires And Two Red Tail Lights in Rear Grille)	Work light fuse failure.	Replace fuse.
	Red wire (P16) from fuse to switch failed open.	0 volts on red wire (P16) at switch with key on. Repair wire.
	Driving light switch failure.	0 volts on brown wires (L05 and L10) at switch with switch on and key on. Replace switch.
	Accessory relay failure (inspect for all light failure).	Turn key switch to ACC or ON. Accessory relay inside console "clicks". If no click is heard and 24 volts is read on wire from switch to relay, replace relay.

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Symptom	Problem	Solution
Driving Lights Will Not Operate—Continued	Brown wires (L05 and L10) failed open.	0 volts on brown wires (L05 and L10) at driving lights. Repair wires.
One Front (White) Driving Light Will Not Operate	Bulb failure.	With driving light switch on, key on, 24 volts is read on brown wire at light.
	Brown wire failed open from switch to bulb.	With light switch on, key, 0 volts is read on brown wire at bulb. Repair brown wire.
	Black wire (ground) failed open from bulb to ground.	If 24 volts is indicated on black wire at light to ground. Repair black wire or ground connection.
One Rear (Red) Tail Light Will Not Operate With Driving Lights On Or Brake Pedal Pushed	Bulb failure (high and low element).	With light switch on, key on, 24 volts is read on brown wire at light. With key off, resistance is read on black wire to ground. Replace bulb.
	Brown wire failed open from switch to bulb.	With light switch on, key switch on, 0 volts is read on brown at light. Repair brown wire.
	Black wire (ground) failed open from bulb to ground.	If 24 volts is indicated on black wire to ground. Repair black wire.
One Rear (Red) Tail Light Will Not Operate When Brake Pedal Is Pushed Or Flasher Is On, But Operate With Driving Lights On (Low Element)	High element (brake/flasher) failed in bulb.	With brake pedal pushed, 24 volts is read. on white wire at light. Replace bulb.
Under Cab Lights Will Not Work (2 White Lights Under Front of Cab)	Fuse failure.	Replace fuse.
	Red wire (P20) from fuse to under cab light switch failed open.	With light switch on, key on, 0 volts is read on brown wire from fuse to light switch. Repair red wire (P20).
	Under cab light switch failed.	With light switch on, key on, 24 volts is read on red wire (P20) at switch, 0 volts is read on brown wire (L09) at switch. Replace switch.

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Symptom	Problem	Solution
Under Cab Lights Will Not Work—Continued	Brown wire (L09) from switch to right light failed open.	With light switch on, key on, 24 volts on brown wire (L09) at switch. 0 volts on brown wire (L09) at right light. Repair wire.
Right Under Cab Light Will Not Operate. Left Under Cab Operates	Right bulb failure.	Replace bulb.
	Black ground wire (G12A) failed open from right light to ground or making poor connection.	If 24 volts is indicated at light to ground. Inspect connections at light and ground.
Left Under Cab Light Will Not Operate. Right Operate. Right Under Cab Light Operates	Left bulb failure.	Replace bulb.
	Brown wire (L09A) from right under cab light to left under cab light light failed open or making poor connection.	Light switch on, key on, 24 volts on brown wire (L09A) at right light. 0 volts on brown wire (L09A) at left light. Repair wire. Inspect connections.
	Black ground wire (G13E) from left under cab light to ground failed open or making poor connection.	If 24 volts is indicated at black wire (G13E) to ground. Repair black wire. Inspect connect connections at light and ground.
Front and Rear Work Lights Will Not Operate (2 Front White Lights Mounted Above Blade, 2 Rear White Lights Mounted In Rear Grille)	Work light fuse failure.	Replace fuse.
	Red wire (P16) from fuse to work light switch failed open.	With light switch on, key on, 24 volts on red wire (P16) at fuse. 0 volts on red wire (P16) at switch. Repair red wire (P16).
	Work light switch failure.	With switch on, key on, 24 volts on red wire (P16) at switch. 0 volts on brown wires (2) at switch. Replace switch.
Front Work Lights Will Not Operate. Rear Work Lights Operate	Work light switch failed in front light half.	With switch in front and rear position and key on. 24 volts on red wire (P16) at switch. 24 volts on brown wire (L05) for rear work lights. 0 volts on brown wire (L10) for front work lights. Replace switch.
	Brown wire (L10) from switch to left front work light failed open.	Light switch in "BOTH" position, key on, 24 volts on brown wire (L10) at switch. 0 volts on brown wire (L10) at left work light. Repair brown wire (L10).

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Symptom	Problem	Solution
Right Front Work Light Will Not Operate. Left Front Work Light Operates	Right bulb failure.	Replace bulb.
	Brown wire (L10A) failed open from left work light to right work light, or poor connections on brown wire (L10A).	Light switch on, key on. 24 volts on brown wire (L10A) at left work light. 0 volts on brown wire (L10A) at right work light. Repair brown wire (L10A) or inspect connections on (L10A).
	Black ground wire from right right work light to ground failed open or making poor connection.	If 24 volts is indicated on black wire at right work light to ground. Repair black wire. Inspect connections at light and ground.
Left Front Work Light Won't Operate.	Left bulb failure.	Replace bulb.
Right Front Work Operates	Black ground wire from left more light to ground failed open. Poor connection.	If 24 volts is indicated on black black wire at left work light to ground. Repair wire. Inspect connections at light and ground.
Rear Work Lights Won't Operate. Front Work Lights Operate	Brown wire (L05) from switch to right rear work light failed open. Wire (L05) making poor connections.	Light switch in "Both" position, Key on 24 volts on brown wire (L05) at switch. 0 volts on brown wire (L05) at right work light. Inspect connections or wire (L05) at switch and light. Repair wire (L05) or inspect connections.
Right Rear Work Light Left Rear Work Light Light Operates	Right bulb failure.	Replace bulb.
	Black ground wire from right work light to ground failed open or making poor connections.	If 24 volts is indicated at right work light to ground. Repair black wires or inspect connections at light and ground.
Left Rear Work Light Won't Operate. Right Rear Work Light Operates Right Rear Work Light Operates	Left bulb failure.	Replace bulb.
	Brown wire (L05A) from right work light to left work light failed open, or wire (L05A) making poor connections at right or left lights.	Light switch in "BOTH" position, Key on. 24 volts on brown wire (L05A) at right work light. 0 volts on wire (L05A) at left work light. 0 volts on wire (L05A) at left work light. Repair wire L05A. Inspect connections at light and ground.
	Black ground wire from left rear work light to ground failed open or making poor connections.	If 24 volts is indicated on black wire at left work light to ground. Repair black wire or inspect connections at light and ground.

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Symptom	Problem	Solution
Left and Right Stop Lights Won't Operate	Stop light circuit breaker. failed.	Replace circuit breaker.
	Red wire (P06) from circuit breaker to stop light switch failed open, or making poor connections at breaker or switch.	24 volts on read wire (P06) at circuit breaker. 0 volts on red wire (P06) at stop light switch. Repair wire (P06). Inspect connections at breaker and switch.
	Stop light switch adjustment.	Adjust switch so brake pedal moves switch plunger its full stroke.
	Stop light switch failure.	24 volts on red wire (P06) at switch. Push brake pedal to move switch plunger full stroke. 0 volts on brown wire (L01) at switch. Replace switch.
Right and Left Stop Lights Won't Work— Continued	Brown wire (L01) from stop light switch to right stop light failed open, or making poor connections.	With brake pedal pushed down. 24 volts on brown wire (L01) at switch. 0 volts on wire (L01) at right stop light. Repair wire (L01) or inspect connections at switch and right light.
Right Stop Light Won't Work. Left Stop Light Works	Right bulb failure.	Replace bulb.
	Brown wire (L01) making poor connection at right light.	Inspect connection. Repair
	Black wire (G06B) from right stop light to ground failed open or making poor connections.	If 24 volts is indicated on black wire (G06) at right stop light to ground. Repair wire.
Left Stop Light Won't Work. Right Stop Light Works.	Left bulb failure. Brown wire (L01A) Failed open or making poor connections.	Replace bulb. With Brake Pedal Pushed Down. 24 volts on brown wire (L01A) at right stop light. 0 volts on wire (L01A) at left stoplight. Repair wire (L01A) or inspect connections at right and left stop lights.
	Black ground wire (G06D) left stop light to ground failed open or making poor connections.	If 24 volts is indicated at left stop light to ground. Repair wire. Inspect connections at left stop light and ground.

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Symptom	Problem	Solution
Left Turn Signal Or Right Turn Signal Won't Operate	Horn/flashers circuit braker failed.	24 volts on one side of circuit breaker and 0 volts on the other replace circuit breaker.
NOTE: 4-Way flasher problems can be diagnosed using same procedures as turn signal problems.	Red wire (P05A) from circuit breaker to horn switch failed open or making poor connection.	24 volts on red wire (P05A) at circuit breaker. 0 volts on red wire (P05A) at horn switch. Repair wire (P05A) or inspect connections at horn/flasher circuit breaker and horn switch.
	Red wires (P05B) from horn	24 volts on red wire (P05B) at flasher. Repair wire (P05B) or inspect connections at horn switch and flasher.
	Flasher failed.	With turn switch in 4-way flash, 24 volts on red wire (P05B) at flasher 0 volts on turquoise wire (J02) at flasher. Replace flasher.
	Turquoise wire (J02) from flasher to turn switch failed open or making poor connection.	24 volts on turquoise wire (J02) at flasher 0 volts on turquoise wire (J02) repair wire (J02) or inspect connections at flasher and turn switch.
Right Front and Rear Turn Signals Won't Operate. Left Front and Rear Turn Signals Operate	Turn switch failure. 24 volts on turquoise wire (J02)	With turn switch in 4-way flash. switch 0 volt on brown wire (L02A) at switch. 24 volts on brown wire (L03A) at switch. Replace switch.
	Brown wire (L02A) failed open from turn switch to right front signal light, or wire (L02A) making poor connection.	With turn switch in 4-way flash, 24 volts on brown wire (L02A) at turn switch. 0 volts on wire (L02A) at signal light. Repair wire (L02A) or inspect connections at turn switch and signal light.
Right Front Turn Signal Won't Operate Right Rear Turn	Right front signal bulb failed.	Replace bulb.
	Brown wires (L02A) making poor connection.	Inspect connection of brown wire (L02A) at light.
Right Rear Turn Signal Won't Operate. Right Front Turn Signal Operates	Brown wire (L02) failed open from right front signal light to right rear signal light or making poor connection.	With turn switch in 4-way flash, 24 volts on brown wire (L02) at right front signal light. O volts on brown wire (L02) at right rear signal light. Repair wire (L02) or inspect connections at right front and rear signal lights.

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Symptom	Problem	Solution
Right Rear Turn Signal Won't Operate Right Front Turn Signal Operates—Continued	Black ground wire failed open from right front signal light to ground or making poor connection.	If 24 volts is indicated on black wire (G06B) at right rear signal light to ground and right tail light and reverse horn operates. Repair wire (G06B). If not repair black wire (G06A) tail light to reverse horn to ground.
Left Front and Rear Turn Signals Won't Operate. Right Front And Rear Turn Signals Operate	Turn switch failure	With turn switch in 4-way flash, 24 volts on turquoise wire (J02) at switch. 24 volts on brown wire (L02A) at switch. 0 volts on brown wire (L03A) at at switch. Replace switch.
	Brown wire (L03A) failed open from turn switch to left front signal light or making poor connection.	With turn switch in 4-way flash, 24 volts on brown wire (LO3A) at turn switch. 0 volts on brown wire (L03A) at left front signal light. Repair wire (L03A) or inspect connections on wire (L03A) at turn switch and left signal light.
Left Front Turn Signal Won't Operate. Left Rear Turn Signal Operates	Left bulb failure	Replace bulb.
	Brown wire (L03A) making poor contact at signal light.	Inspect connection of brown wire (L03A) at light. Repair.
	Black ground wire from signal light to frame failed open, or making poor connection.	If 24 volts is indicated, repair black wire or inspect connections at light and frame
Left Rear Turn Signal Won't Operate. Left Front Turn Signal Operates	Left bulb failure.	Replace bulb.
	Brown wire (L03) from left front signal light to left rear signal light failed open or making poor connection.	With turn switch in 4-way flash, 24 volts on brown wire (L03) at left front signal light. 0 volts on brown wire (L03) at left rear signal light. Repair wire (L03) or inspect connections at left front and rear signal lights.
	Black wire from left rear signal light to left rear tail light failed open, or making poor connection.	If reverse horn, red right and left tail lights operate, repair black wires from left rear signal light to left rear red tail light. Inspect connections at signal light and tail light.

Continued on next page

POWER TRAIN

Symptom	Problem	Solution
Unit Will Not Move Forward Or Reverse	Low transmission oil level.	Adjust to correct level.
	Tow disconnect engaged.	Disengage tow disconnect.
	Park brake on or cable stuck.	Release brake. Repair or replace cable.
	Shift linkage bent, broken or unhooked.	Inspect and repair.
	Shift valve stuck.	See your John Deere dealer.
Unit "Jumps" When Pedal Valve Engaged	Pedal vale malfunction.	See your John Deere dealer.
Unit "Creeps" Excessively	Pedal valve leaking.	See your John Deere dealer.
	Warped discs in transmission.	See your John Deere dealer.
Transmission Shifts Too Slowly	Low oil level.	Adjust to correct level.
	Plugged filter.	Change filter.
	Pressure regulating valve malfunction.	See your John Deere dealer.
	Transmission accumulator malfunction.	See your John Deere dealer.
	Transmission pump malfunction.	See your John Deere dealer.
Transmission Shifts Too Slowly	High system pressure.	See your John Deere dealer.
	Stuck accumulator.	See your John Deere dealer.
Unusual Shifting (Unit Slows When Up-Shifted Or Speeds Up When Down-Shifted)	Stuck shift valve.	See your John Deere dealer.
	Speed selector valve malfunction.	See your John Deere dealer.
Transmission Overheats	(See Hydraulic Overheating.)	
	High oil level.	Adjust to correct level.
	Restricted oil filter.	Change filter.
	Low lubrication oil flow or pressure.	See your John Deere dealer.

Continued on next page

Symptom	Problem	Solution
Transmission Overheats—Continued	Clutch or brake disc warped.	See your John Deere dealer.
	Excessive high speed operation during hot weather.	Lower transport speed.
	Leak in HFWD system.	See your John Deere dealer.
Transmission Control Lever Will Not Move Freely	Lever pivot or linkage binding, worn or bent.	Adjust. Repair or replace.
	Control valve malfunction.	See your John Deere dealer.
Unit Lacks Power Or Moves Slow	Low oil level.	Adjust to correct level.
	Brakes dragging.	Check for excessive heat in tandem pivot housing. See your John Deere dealer.
	Overloading unit.	Reduce load.
	Restricted filter.	Change filter.
	Transmission leaking.	See your John Deere dealer.
	Low engine power.	(See Low Engine Power.)
	Transmission slipping.	See your John Deere dealer.
Unit Makes Excessive Noise When Moving	Transmission/hydraulic oil level low.	Adjust to correct level.
	Transmission or differential failure.	See your John Deere dealer.
	Wheel bearing failure.	See your John Deere dealer.
	Brakes dragging (chattering).	See your John Deere dealer.
Excessive Unit Vibration	Engine slow idle too low.	Adjust slow idle speed.
	Engine mounting hardware loose or missing.	Repair or replace.
	Hydraulic pump drive coupling or mounting hardware loose.	Repair or replace.
	Hydraulic pump malfunction, engine malfunction, transmission malfunction, axle or final drive malfunction.	See your John Deere dealer.

HYDRAULICS

Symptom	Problem	Solution
No Hydraulic Power	Low hydraulic/transmission oil level.	Add oil to correct level.
	Pump destroke screen not turned out completely.	Back screw out to stop.
	Hydraulic or transmission filter plugged.	Change filter element.
	Pump suction screen plugged.	Clean screen.
	Pump stroke control valve stuck.	See your John Deere dealer.
	Stroke control valve setting low	See your John Deere dealer.
	Failed pump drive coupling.	See your John Deere dealer.
	Excessive leakage in hydraulic system.	See your John Deere dealer.
	Failed hydraulic pump.	See your John Deere dealer.
No Hydraulic Steering Power	Priority valve malfunction.	Steering slows during circle rotate or blade sideshift. See your John Deere dealer.
NOTE: See Also "Slow Steering"	Steering valve failure.	See your John Deere dealer.
Slow Hydraulic Functions (All)	Low oil level.	Add oil to correct level.
	Air in hydraulic oil (foamy).	Inspect suction side hoses and fittings to pump.
	Destroke screw not turned completely out.	Turn screw out against stop.
	Engine rpm low.	Inspect and adjust speed control linkage.
	Transmission filter restricted.	Change filter element.
	Hydraulic filter plugged.	Change filter element.
	Pump stroke control valve sticking.	Repair. See your John Deere dealer.
	Pressure control valve stuck.	See your John Deere dealer.

Continued on next page

Symptom	Problem	Solution
Slow Hydraulic Functions (All)—Continued	Hydraulic standby pressure too low.	Adjust. See your John Deere dealer.
	Cooler relief valve stuck	See your John Deere dealer.
	Low pump flow (Worn pump).	See your John Deere dealer.
	Excessive leakage in system	See your John Deere dealer.
Slow Steering Hydraulics *NOTE: Repair any external fitting or line leakage before diagnosing problems.*	Steering valve or cylinder leakage	With steering oil warmed to normal operating temperature turn steering wheel fully right or left against the stop. Continue to turn the wheel against the stop with moderate force. Count steering wheel rpm. More than 5 rpm indicates excessive valve leakage or cylinder leakage. See your John Deere dealer for repair.
Hydraulic Functions Make "Chattering" Noise	Low transmission/hydraulic oil level.	Add oil to proper level.
	Hydraulic filter restricted.	Change filter.
	Transmission or hydraulic filter relief valve stuck open or setting to low	See your John Deere dealer for repairs.
Hydraulic Functions Drift or Settle	Cylinders or control valves leaking.	Inspect. See your John Deere dealer.
	Control valve linkage binding or out of adjustment.	Repair or adjust linkage.
Control Valve Sticks Or Hard To Operate	Control valve linkage binding.	Repair linkage.
	Broken return spring in control valve.	See your John Deere dealer.
	Contamination in valve bore.	See your John Deere dealer.
	Scored valve bore or bent valve spool.	See your John Deere dealer.
Hydraulics Overheats	Excessive load.	Reduce load.
	Oil cooler plugged.	Clean and measure air flow.

Continued on next page

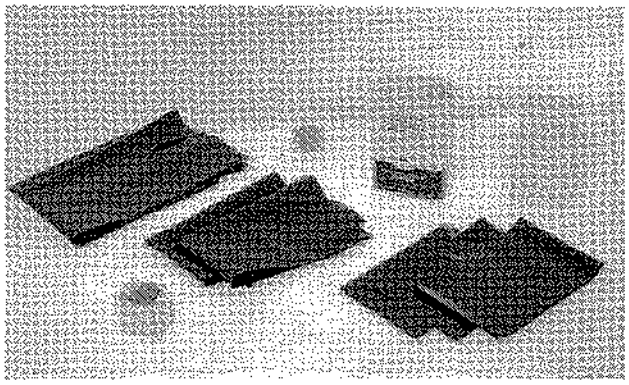
Symptom	Problem	Solution
Hydraulics Overheats—Continued	Low oil level.	Fill to proper level.
	Using low viscosity oil in summer.	Use proper oil.
	Transmission or hydraulic internal leakage.	See your John Deere dealer
Foaming Oil	Oil level too high or low.	Adjust to full mark on dipstick.
	Incorrect type of oil.	Use recommended oil.
	Pump suction screen restricted.	Clean screen.
	Air leak on suction side of pump.	Tighten fittings and inspect hoses for damage.
Hydraulic Pump Leaking	Cap screws holding pump housing together loose.	Tighten screws to torque specification.
	Worn shaft seal.	See your John Deere dealer.
Excessive Pump Noise	Low oil level.	Adjust to correct level.
	Transmission suction screen restriction.	Clean screen.
	Transmission or hydraulic filter restricted.	Change filter.
	Worn transmission pump.	See your John Deere dealer
	Aeration of oil—suction side leaking.	Inspect fittings and lines.
	Oil lines contacting operators station or frame (failed clamps or isolators).	Inspect and repair.
	Loose pump drive coupling.	Repair. See your John Deere dealer.
	Pump attaching hardware loose.	Retorque. See your John Deere dealer.
	Leakage in hydraulic system (pump remains in stroke).	See your John Deere dealer.
	Part failed or sticking in pump.	See your John Deere dealer.
	Misalignment between pump and engine.	See your John Deere dealer.

Storage

PREPARE MACHINE FOR STORAGE

IMPORTANT: Inhibitor easily changes to gas. Seal or tape an opening immediately after using inhibitor.

1. Protect your machine's engine. See your John Deere dealer for AR41785 Engine Storage Protection Kit or equivalent. Follow directions on the tag in this kit.

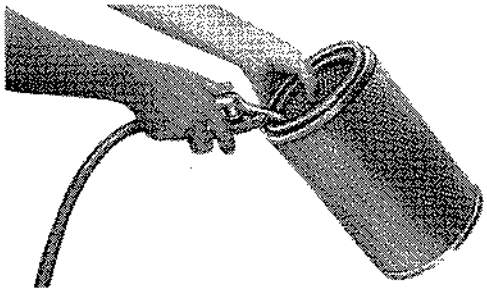


018;T85452 T82;STMO AA. 180387

2. Repair worn or damaged parts. Install new parts, if necessary, to avoid needless delays later.

3. Loosen alternator and fan belts.

4. Clean primary air cleaner element.



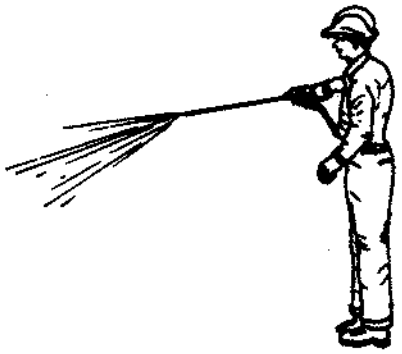
018;T47764 T82;STMO AB 260885 JW

5. Wash the machine. Paint areas to prevent rust. Replace decals, where needed.

6. Remove seat cushion and other perishable items.

7. Retract all hydraulic cylinders, if possible. If not, coat exposed cylinder rods with multi-purpose grease.

8. Lubricate all grease points.

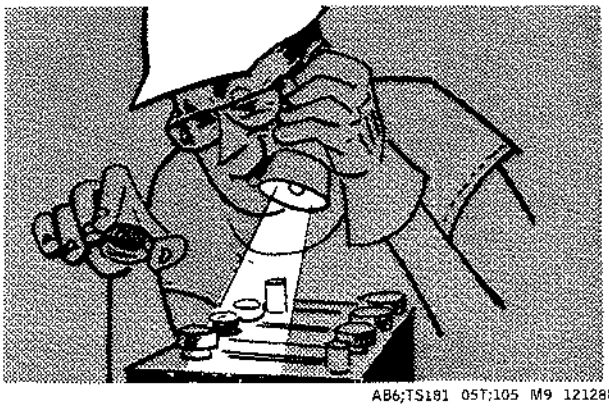


018;T5813AM T82;STMO AC 260885 JW

9. Run machine back and forth several times. Park on a hard surface to prevent tires from freezing to ground.

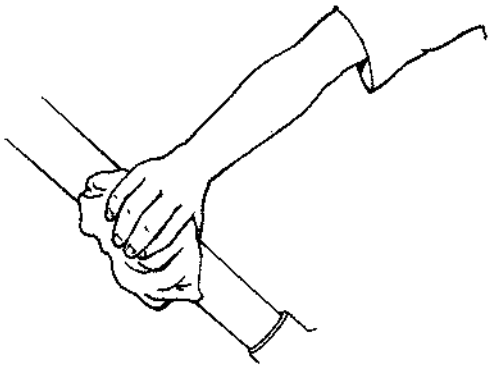
10. Store machine in a dry, protected place. If stored outside, cover with a waterproof material.

11. If machine will be stored more than 30 days, remove battery. Store battery in a cool, dry place not subject to freezing. Check electrolyte level and charge fully. Check battery every 30 days and charge if necessary.



AB6;TS181 05T;105 M9 121288

REMOVE MACHINE FROM STORAGE— 90 DAYS OR MORE



⚠ CAUTION: Start engine ONLY in a well-ventilated area.

1. Follow instructions on the tag in the Engine Storage Protection Kit.

2. Drain water and sediment from fuel tank when air temperature is above freezing.

3. Remove grease from cylinder rods.

018;T6191AA T82;STMO AE 200985 JW

IMPORTANT: During cold temperatures, check fluidity of engine oil on dipstick. If the oil appears waxy and/or jelly-like rather than liquid, DO NOT attempt to start engine. Use external heat source to warm the crankcase until oil appears fluid.

4. Check all fluid levels. If low, check for leaks and add oil as required.

5. Check and adjust belts.

6. Check electrolyte level. Charge and install battery.

018;T6181AU T82;STMO AF 050985 JW

7. Fill fuel tank.

8. Pre-lubricate turbocharger bearings:

   a. Pull fuel shut-off knob up.
   b. Crank engine for 10 seconds.
   c. Push fuel shut-off knob down.
   d. Start engine. Run several minutes at one-third speed until engine is at normal operating temperature.

T82;105 C2 090189

9. Bleed fuel system. If engine fails to start or runs poorly after starting, change fuel filter(s). Bleed fuel system again.

10. Operate all controls, levers, brakes, seat adjustments, etc.

11. Cycle all hydraulic functions several times. Check condition of all hoses and connections.

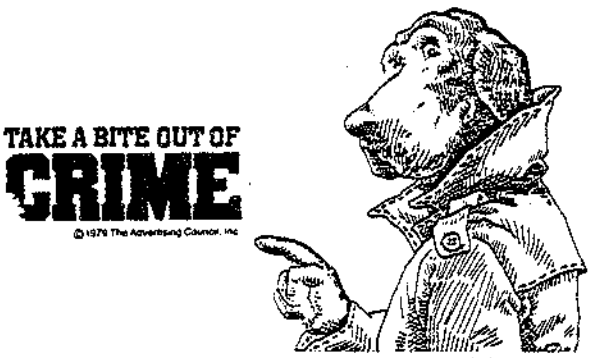
12. Check condition of tires. Check tire pressure.

08T;105 W10 121288

Crime Prevention Tips

HELP PREVENT CRIME

You can help take a bite out of crime by properly documenting ownership and discouraging theft.



AB6;TS140 053;CRPRV A. 201187

RECORD IDENTIFICATION NUMBERS

1. Mark your machines with your own unique numbering system.

2. Record the Product Identification Number (PIN) of the unit and also individual component identification numbers for engines, axles, pumps, etc.

3. Include the identification numbers on all documentation, such as insurance, financial, and warranty papers.

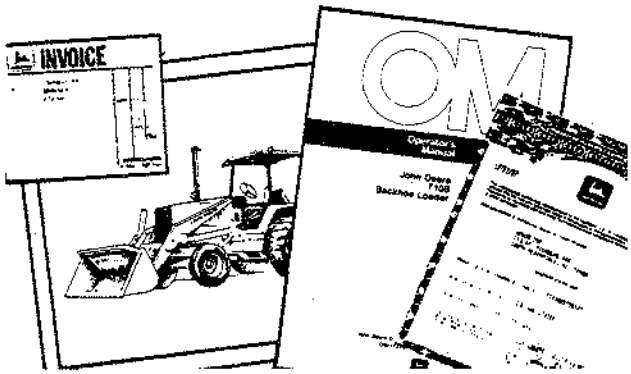
AB6;TS156 053;CRPRV H 201187

KEEP PROOF OF OWNERSHIP

1. Take color photographs from several angles of each machine.

2. Maintain an up-to-date inventory of all your machines.

3. Keep your documented identification numbers, color photographs, and inventory in a safe, secure location.

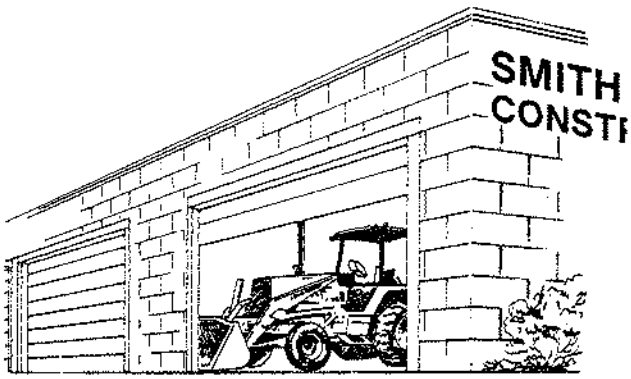


AB6;TS157 053;CRPRV I 311187

PARK INDOORS OUT OF SIGHT

Make machines hard to move:

- Park hard-to-move equipment in front of exits.
- Lower all equipment to the ground.
- Remove ignition key. Remove battery if unit is stored for a long period.
- Lock cab doors, windows, and vandal protection devices.
- Lock storage building.

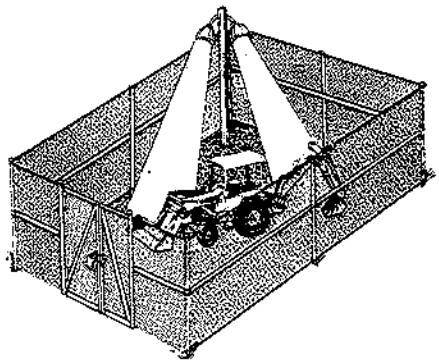


AB6;TS158 05T;110 M1 121288

WHEN PARKING OUTDOORS

Make machines hard to move:

- Park in a well-lighted, fenced area.
- Lower all equipment to the ground.
- Remove ignition key. Remove battery if unit is stored for a long period.
- Lock cab doors, windows, and vandal protection devices.



AB6;TS144 057;110 M2 121288

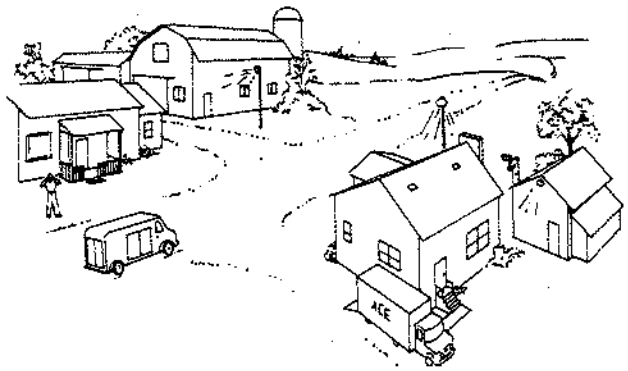
REDUCE VANDALISM

1. Install vandal protection devices.

2. Participate in a neighborhood watch program.

3. Take written notes of suspicious vehicles or persons and report your findings to law enforcement agency.

4. Regularly verify that identification plates have not been removed. If they have, notify law enforcement agency. Order duplicate plates from your John Deere dealer.



AB6;TS159 053;CRPRV L 030288

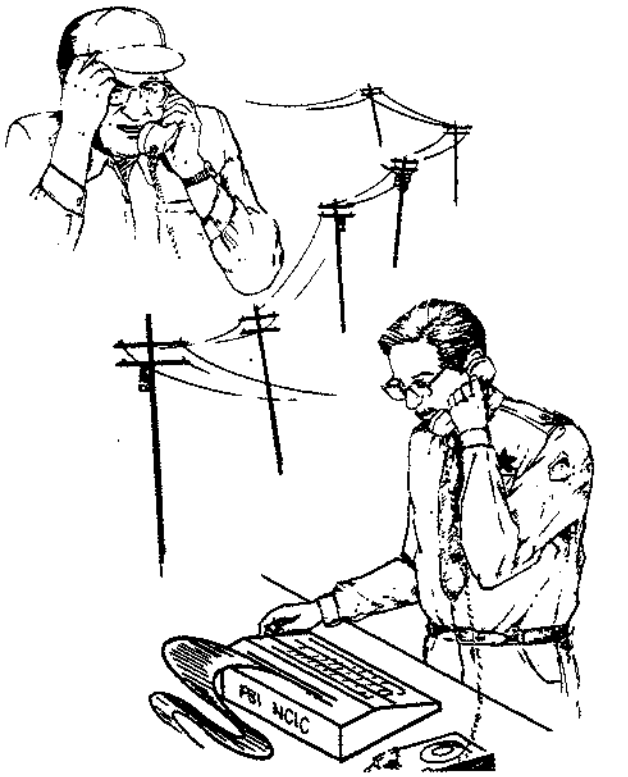
REPORT THEFTS IMMEDIATELY

1. Immediately notify your local law enforcement agency and insurance agent.

2. Provide a complete description of the machine, all of the documented identification numbers and color photographs.

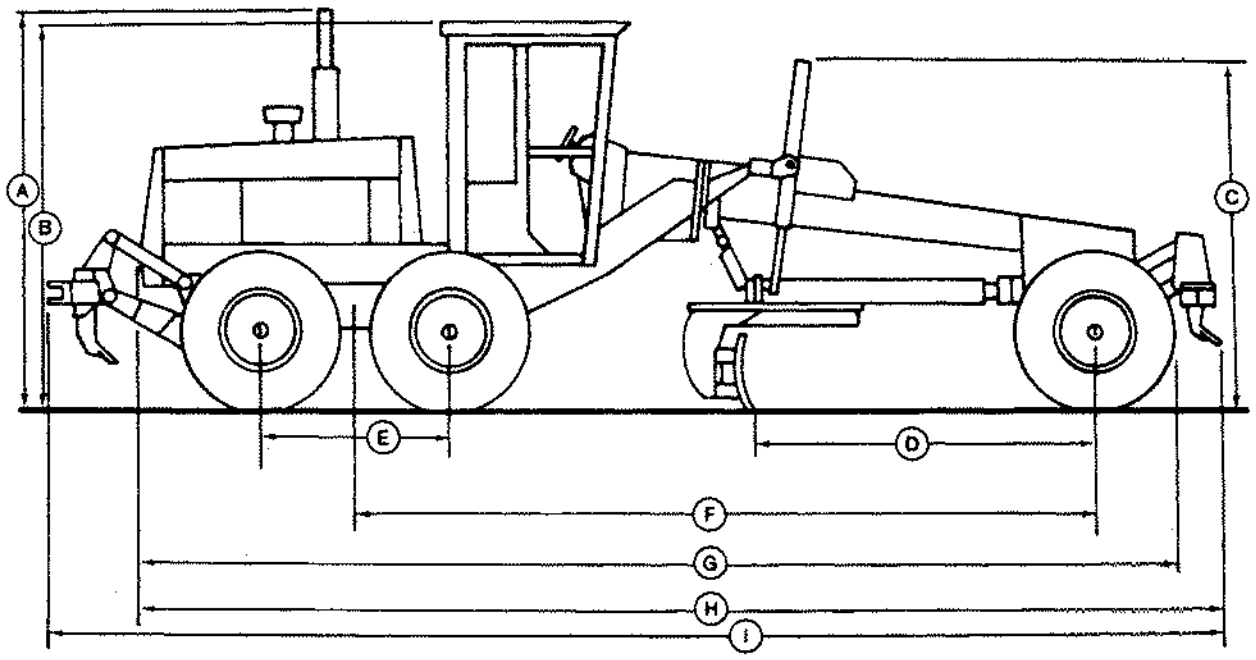
3. Request verification of the identification numbers after they have been entered with any regional or national crime information center. Double check the numbers to be sure they are correct.

4. Notify your John Deere dealer of the theft and request that its loss be posted with full description and identification numbers.



AB6;TS146 053;CRPRV G 121187

Specifications



A—10 ft 3.8 in (3.14 m)
B—*10 ft 0.8 in. (3.07 m)
C—9 ft 1.3 in. (2.78 m)
D—8 ft 5 in. (2.57 m)
E—5 ft 0.7 in. (1.54 m)
F—19 ft 7 in. (5.97 m)
G—27 ft 3.2 in. (8.31 m)
H—29 ft 7.5 in. (9.03 m)
I—31 ft 11.5 in. (9.74 m)

*Add 8.3 in. (210 m) for full height cab.
Add 1.0 in. (25.4 mm) for cab with air conditioning.

Items in bold print refer to 672B Motor Grader only.

NOTE: Dimensions for the 670B and 672B are the same.

Rated Power @ 2300 rpm	SAE
Net	135 hp (101 kw)
Gross	142 hp (106 kw)

Engine: John Deere 6-414T

Type	4-stroke cycle, turbocharged diesel
Bore and stroke	4.19 x 5.00 in. (106.4 x 127 mm)
Number of cylinders	6
Displacement	414 cu in. (6.785 L)
Compression ratio	16.2 to 1
Maximum net torque @ 1300 rpm	372 lb-ft (504 N·m) (51.4 kg-m)
Lubrication	Pressure system with full-flow filter
Cooling fan	Suction type
Air cleaner	Dry
Electrical system	24 volt with/42 amp alternator
Batteries	Reserve capacity: 180 minutes

Transmission: ..... Direct drive, planetary power shift with foot inching pedal.

91A;T6921AG T82;115 C1 120189

1T4;0115 01 100189

Travel Speeds:

Forward	mph	km/h
1	2.2	3.5
2	3.2	5.1
3	4.9	7.9
4	6.4	10.3
5	8.4	13.5
6	10.9	17.5
7	14.2	22.9
8	24.4	39.3
Reverse		
1	2.9	4.7
2	4.1	6.6
3	6.3	10.1
4	8.2	13.2

Front Drive: Standard and high speed front wheel drive systems are available to match different applications. Both use a variable-displacement pump, a reversible motor in each wheel, and a flow divider to assure front wheel traction. Each system has normal and aggressive modes and free-wheels st transport speeds or when not in use.

Stsndard system ..... **effective in gears 1—4—5.03 cu in. (89 cu cm) pump, 2.03 cu. In (33 cu cm) motors**

High speed system ..... **effective in gears 1—6—6.00 cu in (98 cu cm) pump, 2.03 cu in (33 cu cm) motors**

Front Axle ..... Fabricated steel box frame

..... **Fabricated steel box frame with planetary drive**

Total oscillation ..... 32°

Wheel lean range (either direction) ..... 20°

Minimum turning radius ..... 22 ft (6.7 m)

Minimum turning radius ..... **22 ft 6 in. (6.86 m)**

Hydraulic System (Standard and Optional):

Closed center, pressure controlled, variable displacement pumps.

Standard pump ..... 4.0 cu in. (65 cu cm), 37.6 gpm at 2300 rpm

Optional pump ..... 6.0 cu in. (98 cu cm), 54.8 gpm at 2300 rpm

Circle:

Rotation ..... 360°

Sideshift, right ..... 27.0 in. (686 mm)

left ..... 28.5 in. (724 mm)

Refill Capacities:	U.S.	Metric
Fuel tank	70 gal	265 L
Cooling system	7 gal	26.5 L
Engine lubrication, including filter	20 qt	19 L
Transmission and hydraulic system includes filter changes	14 gal	53 L
Tandem housings (each)	5 gal	19 L
Circle gearbox	3 qt	2.8 L
Wheel motors (each)	2 gal	7.5 L

T82;115 C2 120189

SAE Operating Weight:	On Front Wheels	On Rear Wheels	Total
Standard equipment—670B	8000 lb (3629 kg)	19,150 lb (8686 kg)	27,150 lb (12 315 kg)
—672B	**8700 lb (3946 kg)**	**19,400 lb (8800 kg)**	**28,100 lb (12 746 kg)**

NOTE: Specifications and design subject to change without notice. Wherever applicable, specifications are in accordance with SAE Standards. Except where otherwise noted, these specifications are based on a unit with 13.00—24, 8-PR, tubeless tires with 8 in. (203 mm) rims, 12 ft (3.65 m) moldboard with 6 in. (152 mm) cutting edge, and standard equipment. Weights include lubricants, coolants, full fuel tank and 175 lb (79 kg) operator.

T82;115 C3 090186

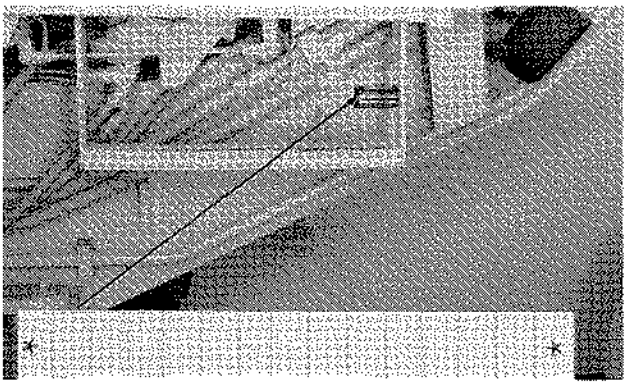
1T4;0115 03 100189

Machine Numbers

RECORD PRODUCT IDENTIFICATION NUMBER (PIN)

Purchase Date _____

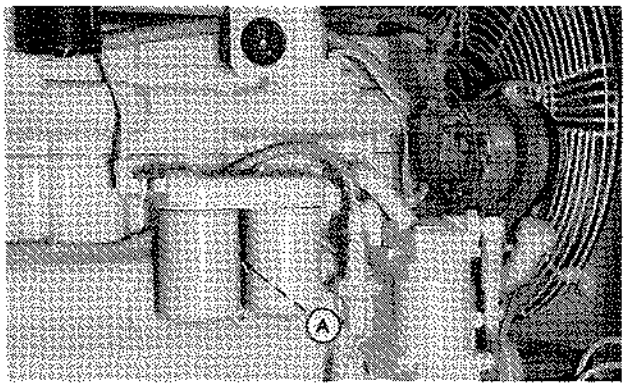
NOTE: Record all 13 characters of the Product Identification Number.



91A;T616480 T82;120 C1 191288

RECORD ENGINE SERIAL NUMBER

Engine Serial Number (A) _____



91A;T6921AF 05T;120 K21 090189

RECORD TRANSMISSION SERIAL NUMBER

Transmission Serial Number _____

Located on left rear side of clutch housing.

T82;120 C5 181285

RECORD HYDRAULIC PUMP SERIAL NUMBER

Hydraulic Pump Serial Number _____

Located on right side of pump.

T82;120 C6 181285

1T4;0120 01 100189

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Checklists

JOHN DEERE 670B AND 672B MOTOR GRADERS

PRE-DELIVERY INSPECTION (PDI), AFTER-SALE INSPECTION (ASI)

MACHINE NUMBERS

Product Identification Number _____ Transmission Serial Number _____

Engine Serial Number _____ Hydraulic Pump Serial Number _____

PRE-DELIVERY INSPECTION
(Required Before Delivery of Machine to Owner)

Delivered by _____ Owner's Name _____

Dealer _____ Owner's Address _____

Oate _____ City _____ State _____ Zip _____

AFTER-SALE INSPECTION
(Required Durlng 50 to 100 Hours of Operation)

Machine Hours _____ Owner's Name _____

Inspected By _____ Owner's Address _____

Inspector's Signature _____ City _____ State _____ Zip _____

Dealership _____ Owner's Signature _____

Litho in U.S.A.

Dealer Copy 1

05T;CL K182 090189

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JOHN DEERE 670B AND 672B MOTOR GRADERS

PRE-DELIVERY INSPECTION (PDI), AFTER-SALE INSPECTION (ASI)

MACHINE NUMBERS

Product Identification Number _____ Transmission Serial Number _____

Engine Serial Number _____ Hydraulic Pump Serial Number _____

PRE-DELIVERY INSPECTION
(Required Before Delivery of Machine to Owner)

Oelivered by _____ Owner's Name _____

Dealer _____ Owner's Address _____

Oate _____ City _____ State _____ Zip _____

AFTER-SALE INSPECTION
(Required During 50 to 100 Hours of Operation)

Machine Hours _____ Owner's Name _____

Inspected By _____ Owner's Address _____

Inspector's Signature _____ City _____ State _____ Zip _____

Dealership _____ Owner's Signature _____

Litho in U.S.A.

Region Copy 1

05T;CL K183 090189

1T4;PCLIS 2 100189

JOHN DEERE 670B AND 672B MOTOR GRADERS

PRE-DELIVERY INSPECTION (PDI), AFTER-SALE INSPECTION (ASI)

MACHINE NUMBERS

Product Identification Number _____ Transmission Serial Number _____

Engine Serial Number _____ Hydraulic Pump Serial Number _____

PRE-DELIVERY INSPECTION
(Required Before Delivery of Machine to Owner)

Delivered by _____ Owner's Name _____

Dealer _____ Owner's Address _____

Date _____ City _____ State _____ Zip _____

AFTER-SALE INSPECTION
(Required During 50 to 100 Hours of Operation)

Machine Hours _____ Owner's Name _____

Inspected By _____ Owner's Address _____

Inspector's Signature _____ City _____ State _____ Zip _____

Dealership _____ Owner's Signature _____

Litho in U.S.A.

Owner Copy 1

05T;CL K184 110189

174;PCLTS 3 100189

The following inspections must be performed by you, the dealer. Check off each item as it is completed. Refer to the Operator's Manual for detailed information.

PDI OK	ASI OK	
☐	☐	1. Check fluid leakage.
☐	☐	2. Check loose or missing hardware.
☐	☐	3. Check tire pressure.
☐	☐	4. Check coolant level.
☐	☐	5. Check air inlet cover.
☐	☐	6. Check air intake hose.
☐	☐	7. Check engine oil level.
☐	☐	8. Check engine oil condition.
☐	☐	9. Check transmission-hydraulic oil level.
☐	☐	10. Check transmission-hydraulic oil condition.
☐	☐	11. Check fuel filter sediment.
☐	☐	12. Check belt tension.
☐	☐	13. Check battery electrolyte level.
☐	☐	14. Check battery terminals.
☐	☐	15. Check fuel tank sump.
☐	☐	16. Check tandem oil level.
☐	☐	17. Check tandem oil condition.
☐	☐	18. Check tandem oil breather tube.
☐	☐	19. Check circle drive gearbox oil level.
☐	☐	20. Check circle drive gearbox oil condition.
☐	☐	21. Check circle drive gearbox breather tube.
☐	☐	22. Grease Lubrication points.
☐	☐	23. Check bulb, gauges, and indicators.
☐	☐	24. Check park brake lever and park lock.
☐	☐	25. Check neutral start system.
☐	☐	26. Check instruments after starting.
☐	☐	27. Check brake accumulator.
☐	☐	28. Check brakes.
☐	☐	29. Check reverse warning alarm.
☐	☐	30. Check steering operation.
☐	☐	31. Check control levers and switch.
☐	☐	32. Check horn operation.
	☐	33. Check inching pedal (clutch) operation.
	☐	34. Check differential lock.
☐	☐	35. Check transmission operation, HFWD operation.
☐	☐	36. Check starting aid.
☐	☐	37. Check seat adjustments.
☐	☐	38. Check lights—if equipped.
☐	☐	39. Check heating and cooling controls.

Comments: _____

Litho in U.S.A.

Dealer Copy 2

05T;CL K1B5 110189

1T4;PGL1S 4 100189

The following inspections must be performed by you, the dealer. Check off each item as it is completed. Refer to the Operator's Manual for detailed information.

PDI OK	ASI OK		PDI OK	ASI OK	
☐	☐	1. Check fluid leakage.	☐	☐	21. Check circle drive gearbox breather tube.
☐	☐	2. Check loose or missing hardware.	☐	☐	22. Grease Lubrication points.
☐	☐	3. Check tire pressure.	☐	☐	23. Check bulb, gauges, and indicators.
☐	☐	4. Check coolant level.	☐	☐	24. Check park brake lever and park lock.
☐	☐	5. Check air inlet cover.	☐	☐	25. Check neutral start system.
☐	☐	6. Check air intake hose.	☐	☐	26. Check instruments after starting.
☐	☐	7. Check engine oil level.	☐	☐	27. Check brake accumulator.
☐	☐	8. Check engine oil condition.	☐	☐	28. Check brakes.
☐	☐	9. Check transmission-hydraulic oil level.	☐	☐	29. Check reverse warning alarm.
☐	☐	10. Check transmission-hydraulic oil condition.	☐	☐	30. Check steering operation.
☐	☐	11. Check fuel filter sediment.	☐	☐	31. Check control levers and switch.
☐	☐	12. Check belt tension.	☐	☐	32. Check horn operation.
☐	☐	13, Check battery electrolyte level.		☐	33. Check inching pedal (clutch) operation.
☐	☐	14. Check battery terminals.		☐	34. Check differential lock.
☐	☐	15. Check fuel tank sump.	☐	☐	35. Check transmission operation, HFWD operation.
☐	☐	16. Check tandem oil level.	☐	☐	36. Check starting aid.
☐	☐	17. Check tandem oil condition.	☐	☐	37. Check seat adjustments.
☐	☐	18. Check tandem oil breather tube.	☐	☐	38. Check lights—if equipped.
☐	☐	19. Check circle drive gearbox oil level.	☐	☐	39. Check heating and cooling controls.
☐	☐	20. Check circle drive gearbox oil condition.			

Comments: _____

Litho in U.S.A.

Region Copy 2

05T;C(K186 090189

174;PCLIS S 100189

The following inspections must be performed by you, the dealer. Check off each item as it is completed. Refer to the Operator's Manual for detailed information.

PDI OK	ASI OK		PDI OK	ASI OK	
☐	☐	1. Check fluid leakage.	☐	☐	21. Check circle drive gearbox breather tube.
☐	☐	2. Check loose or missing hardware.	☐	☐	22. Grease Lubrication points.
☐	☐	3. Check tire pressure.	☐	☐	23. Check bulb, gauges, and indicators.
☐	☐	4. Check coolant level.	☐	☐	24. Check park brake lever and park lock.
☐	☐	5. Check air inlet cover.	☐	☐	25. Check neutral start system.
☐	☐	6. Check air intake hose.	☐	☐	26. Check instruments after starting.
☐	☐	7. Check engine oil level.	☐	☐	27. Check brake accumulator.
☐	☐	8. Check engine oil condition.	☐	☐	28. Check brakes.
☐	☐	9. Check transmission-hydraulic oil level.	☐	☐	29. Check reverse warning alarm.
☐	☐	10. Check transmission-hydraulic oil condition.	☐	☐	30. Check steering operation.
☐	☐	11. Check fuel filter sediment.	☐	☐	31. Check control levers and switch.
☐	☐	12. Check belt tension.	☐	☐	32. Check horn operation.
☐	☐	13, Check battery electrolyte level.		☐	33. Check inching pedal (clutch) operation.
☐	☐	14. Check battery terminals.		☐	34. Check differential lock.
☐	☐	15. Check fuel tank sump.	☐	☐	35. Check transmission operation, HFWD operation.
☐	☐	16. Check tandem oil level.	☐	☐	36. Check starting aid.
☐	☐	17. Check tandem oil condition.	☐	☐	37. Check seat adjustments.
☐	☐	18. Check tandem oil breather tube.	☐	☐	38. Check lights—if equipped.
☐	☐	19. Check circle drive gearbox oil level.	☐	☐	39. Check heating and cooling controls.
☐	☐	20. Check circle drive gearbox oil condition.			

Comments: _____

Litho in U.S.A.

Owner Copy 2

05T;CL K:87 090189

1T4;PCLIS 6 100189

PDI OK	ASI OK	
☐	☐	40. Check windshield wiper controls.
☐	☐	41. Check defroster fan.
☐	☐	42. Perform radiator cooler air flow test.
☐	☐	43. Check locks and latches.
☐	☐	44. Check wheel cap screw torque.
☐	☐	45. Check appearance of machine.
	☐	46. Check injection pump fuel shut-off linkage.
	☐	47. Check injection pump line clamp.
	☐	48. Check electrolyte specific gravity.
☐	☐	49. Check coolant freeze-protection level.
☐	☐	50. Check radiator area.
☐	☐	51. Check coolant hoses.
☐	☐	52. Check belt condition.
	☐	53. Replace engine oil and filter.
	☐	54. Replace hydraulic return oil filter.
	☐	55. Replace transmission oil filter.
	☐	56. Tighten rear circle support nuts.
	☐	57. Tighten front circle support nuts.
	☐	58. Tighten lower blade retainer cap screws.
	☐	59. Tighten upper blade retainer cap screws.

Comments: _____

Litho in U.S.A.

Dealer Copy 3

05T;CL K188 090189

1T4;PCLIS 7 100189

PDI OK	ASI OK	
☐	☐	40. Check windshield wiper controls.
☐	☐	41. Check defroster fan.
☐	☐	42. Perform radiator cooler air flow test.
☐	☐	43. Check locks and latches.
☐	☐	44. Check wheel cap screw torque.
☐	☐	45. Check appearance of machine.
	☐	46. Check injection pump fuel shut-off linkage.
	☐	47. Check injection pump line clamp.
	☐	48. Check electrolyte specific gravity.
☐	☐	49. Check coolant freeze-protection level.
☐	☐	50. Check radiator area.
☐	☐	51. Check coolant hoses.
☐	☐	52. Check belt condition.
	☐	53. Replace engine oil and filter.
	☐	54. Replace hydraulic return oil filter.
	☐	55. Replace transmission oil filter.
	☐	56. Tighten rear circle support nuts.
	☐	57. Tighten front circle support nuts.
	☐	58. Tighten lower blade retainer cap screws.
	☐	59. Tighten upper blade retainer cap screws.

Comments: _____

Litho in U.S.A.

Region Copy 3

05T;CL K189 :10189

174;PCL1S 8 100189

PDI OK	ASI OK	
☐	☐	40. Check windshield wiper controls.
☐	☐	41. Check defroster fan.
☐	☐	42. Perform radiator cooler air flow test.
☐	☐	43. Check locks and latches.
☐	☐	44. Check wheel cap screw torque.
☐	☐	45. Check appearance of machine.
	☐	46. Check injection pump fuel shut-off linkage.
	☐	47. Check injection pump line clamp.
	☐	48. Check electrolyte specific gravity.
☐	☐	49. Check coolant freeze-protection level.
☐	☐	50. Check radiator area.
☐	☐	51. Check coolant hoses.
☐	☐	52. Check belt condition.
	☐	53. Replace engine oil and filter.
	☐	54. Replace hydraulic return oil filter.
	☐	55. Replace transmission oil filter.
	☐	56. Tighten rear circle support nuts.
	☐	57. Tighten front circle support nuts.
	☐	58. Tighten lower blade retainer cap screws.
	☐	59. Tighten upper blade retainer cap screws.

Comments: _____

Litho in U.S.A.

Owner Copy 3

G5T;CL K190 090189

174;PCLIS 9 100189

MAINTENANCE AND REPAIR RECORD KEEPING SYSTEM

SERVICE INTERVALS

Service your machine at intervals shown on this chart. Also, perform service on items at multiples of the original requirement. For example, at 500 hours also service those items (if applicable) listed under 250 hours, 100 hours, 50 hours and 10 hours or daily.

As Required

- Check battery
- Check belts
- Grease lift arm locking pin holes
- Grease draft frame circle supports
- Check tires
- Grease circle
- Check air cleaner restriction
- Drain fuel tank sump
- Check precleaner

Every 10 Hours or Daily

- Check transmission and hydraulic oil level
- Check radiator coolant level
- Grease frame hinge pivots
- Check engine oil level

Every 50 Hours

- Grease lift cylinder yoke pivots
- Grease tie rod ends
- Grease front axle lean pivots
- Grease front axle lean cylinder pivots
- Grease front axle spindles
- Grease steering yokes and cylinder pivots
- Grease front axle pivot
- Grease frame steer cylinder pivot

REQUIRED PARTS

Insure machine performance and availability; use only genuine John Deere parts. Verify part numbers are current and that any associated parts are also on hand, i.e. filter O-rings.

		250 Hours	500 Hours	1000 Hours	2000 Hours
Engine Oil Filter	T19044	1	1	1	1
Fuel Fillers	AR50041		2	2	2
Hydraulic Return Oil Filter	AR98098		1	1	1
Transmission Oil Filter	AR98098		1	1	1
HFWD Pump Return Filter	AT58368		1	1	1
Hydraulic Front Axle Return Filter	AT60645		1	1	1
Air Filter Primary	AT39124			1	1
Air Filter Secondary	AT31227			1	1
TORQ-GARD SUPREME® Oil		20 qt (19 L)	20 qt (19 L)	20 qt (19 L)	20 qt (19 L)
TORO-GARD SUPREME® Oil (wheel motors if equipped)		2 gal (7.6 L)	2 gal (7.6 L)	2 gal (7.6 L)	2 gal (7.6 L)
HY-GARD® Transmission and Hydraulic Oil				16 gal (60.5 L)	26 gal (98.4 L)
OILSCAN Kit	IPSKIT1	1	2	4	7
API GL-5 Gear Oil				4 qt (3.8 L)	4 qt (3.8 L)
RE12842 Rust Inhibitor			1	1	1

MAINTENANCE AND REPAIR RECORD KEEPING SYSTEM

Model: 670B and 672B Motor Graders Customer: _____
PIN/Serial Number: _____ Delivery Date: _____ Hour Meter Reading: _____

OIL SAMPLING

Oil samples should be taken from each system prior to its recommended drain/change interval indicated on this form: 250, 500, 1000, 2000. Maintenance recommendations supplied by OILSCAN will be provided based upon the oil analysis and operating information you supply. Regular oil sampling will extend the operational life of your machine's systems.

Every 250 Hours

- ☐ Check battery water level
- ☐ Grease blade pitch cylinder pivots
- ☐ Grease lift arm locking pin
- ☐ Grease lift arms and cylinders
- ☐ Grease draft frame ball
- ☐ Check circle gearbox oil
- ☐ Replace engine oil filter
- ☐ Drain engine oil

Comments: _____

Date: _____ Hour Meter Reading: _____
Maintenance Performed By: _____

Every 500 Hours

- ☐ Check tandem oil level
- ☐ Add radiator conditioner
- ☐ Check brake accumulator
- ☐ Replace fuel filters
- ☐ Replace transmission oil filter
- ☐ Replace hydraulic return filter

Comments: _____

Date: _____ Hour Meter Reading: _____
Maintenance Performed By: _____

Every 1000 Hours

- ☐ Adjust engine valve lash
- ☐ Replace H.F.W.D. Pump Return Filter
- ☐ Drain transmission and hydraulic oil
- ☐ Replace hydraulic front axle return filter
- ☐ Replace hydraulic return filter
- ☐ Adjust engine speed linkage
- ☐ Clean engine crankcase vent tube
- ☐ Check air intake hoses

Comments: _____

Date: _____ Hour Meter Reading: _____
Maintenance Performed By: _____

Every 2000 Hours

- ☐ Drain tandem oil
- ☐ Grease tandem pivots
- ☐ Drain circle gearbox oil

Comments: _____

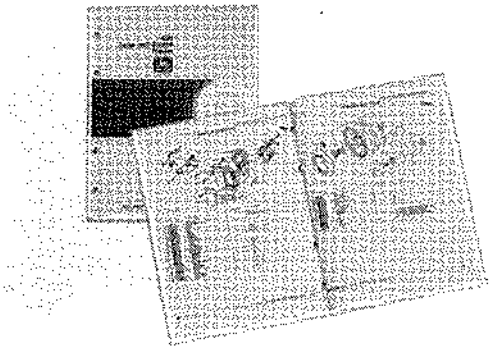
Date: _____ Hour Meter Reading: _____
Maintenance Performed By: _____

03T;50 K130 060189

John Deere Service Literature Available

PARTS CATALOG

The parts catalog lists service parts available for your machine with exploded view illustrations to help you identify the correct parts. It is also useful in assembling and disassembling.

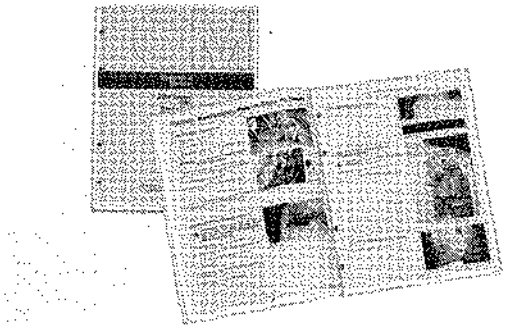


AB6;TS189 053;PARTS 271185

OPERATOR'S MANUAL

The operator's manual provides safety, operating, maintenance, and service information about John Deere machines.

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

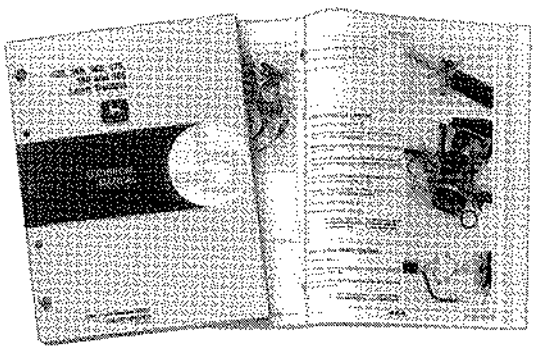


AB6;TS191 053;INDOM 271185

TECHNICAL AND SERVICE MANUALS

Technical and service manuals are service guides for your machine. Included in the manual are specifications, diagnosis, and adjustments. Also illustrations of assembly and disassembly procedures, hydraulic oil flows, and wiring diagrams.

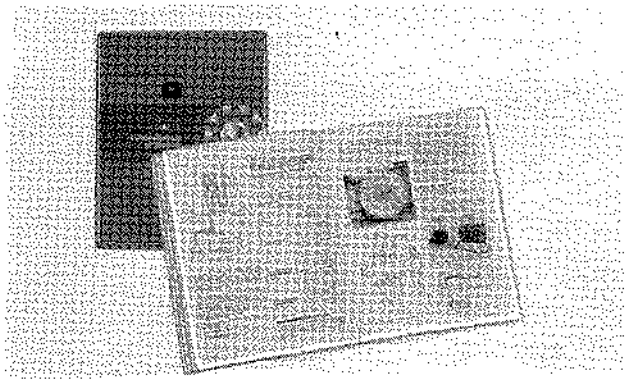
Component technical manuals are required for some products. These supplemental manuals cover specific components.



AB6;TS224 053;TM 211287

FUNDAMENTALS OF SERVICE MANUALS

These basic manuals cover most makes and types of 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.



AB6;TS193 053;FOS 271185

John Deere Service Literature Available

John Deere Distribution Service Center
Department S/P
P.O. Box 186, Moline, IL 61266-0186

To order these publications, fill out this form and the payment information and mail it to the address above. Make checks payable to Deere & Co. Service Publications. Please allow three weeks for delivery. No COD orders, please. Do not send cash or stamps. To place credit card orders, call 1-800-522-7448. If you want manuals or catalogs for equipment not shown on this list, provide the model number, serial number, and name of the product.

Please ship to . . .

Name _____

Address _____

City _____ State _____

Zip _____ Phone _____

Title	Order Number	Price Each	x Quantity	= Total
670B and 672B Motor Graders				
Parts Catalog	PC-2063		x	=
Operator's Manual	OM-T123951		x	=
Technical Manual (Repair)	TM-1453		x	=
Technical Manual (Test)	TM-1452		x	=
Component Manual—Engine	CTM-1		x	=
Componant Manual—Engine Accessories	CTM-11		x	=
Safety Manual	DB1002		x	=
			x	=
			x	=
For current prices of John Deere Service Literature, please call 1-800-522-7448			x	=
			x	=
			x	=
			x	=
FOS Manual—Hydraulics	FOS-1004B		x	=
FOS Manual—Electrical Systems	FOS-2005B		x	=
FOS Manual—Engines	FOS-3006B		x	=
FOS Manual—Power Trains	FOS-4005B		x	=
SET OF FOUR FOS MANUALS (above)	FOS-90-Set		x	=
FOS Manual—Shop Tools	FOS-5104B		x	=
FOS Manual—Welding	FOS-5206B		x	=
FOS Manual—Belts and Chains	FOS-5304B		x	=
FOS Manual—Bearings and Seals	FOS-5404B		x	=
FOS Manual—Tires and Tracks	FOS-5506B		x	=
FOS Manual—Mowing & Spraying Equipment	FOS-5604B		x	=
FOS Manual—Air Conditioning	FOS-5705B		x	=
FOS Manual—Fuels, Lubricants & Coolants	FOS-5806B		x	=
FOS Manual—Fiber Glass	FOS-5903B		x	=
FOS Manual—Fasteners	FOS-6003B		x	=
FOS Manual—Iden. of Parts Failures	FOS-6103B		x	=
SET OF 11 FOS MANUALS (above)	FOS-71-Set		x	=
SET OF ALL 15 FOS MANUALS	FOS-181-Set		x	=
Catalogs of Available Service Publications:				
Industrial Product Publications	CPC-1852			
Consumer Product Publications	CPC-1704			
Agricultural Product Publications	CPC-1703			
		Subtotal		

Illinois state residents add 6.25% and Iowa state residents add 4% for Retail Occupation Tax or show tax exemption number.

Shipping, Handling, & Insurance

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

Prices subject to change without notice.
SP-219 Apr-89

John Deere Service Keeps You on the Job

JOHN DEERE PARTS

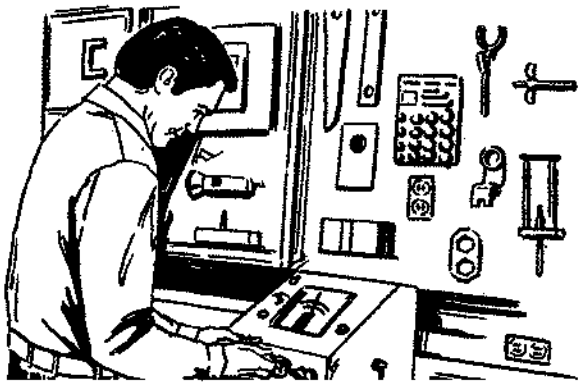
We help minimize downtime by putting genuine John Deere parts in your hands in a hurry.

That's why we maintain a large and varied inventory—to stay a jump ahead of your needs.

AB6;TS100 053;IBC A 190888

THE RIGHT TOOLS

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



AB6;TS101 053;IBC B 030985

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!

AB6;TS102 053;IBC C 080388

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.

AB6;TS103 053;IBC D 080388