



Thomas 81/83

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To LB000509

Owners Manual

THOMAS EQUIPMENT LIABILITY WARRANTY

THOMAS EQUIPMENT LIMITED (Hereinafter referred to as the "Company") warrants each new Thomas S/S Loader sold by the Company to be free from manufacturing defects when used in normal service for a period of twelve [12] months*, or 1000 hours, whichever occurs first, commencing with delivery to the original user, if operated according to manufacturer instructions and by a competent and careful operator. This warranty shall not apply to the loader or any part thereof which has been subject to misuse, negligence, alteration, or accident or which shall have been repaired outside of an authorized Thomas dealer place of business.

The Company's obligation under this warranty is expressly limited to the replacement or repair at Thomas Equipment Limited, Centreville, New Brunswick, or at a designated Thomas Dealer, of such part or parts which in the opinion of the Company have been defective. The Company shall not be liable for consequential labour costs or transportation charges in connection with the replacement or repair of defective parts.

This warranty to repair applies only to new and unused Thomas S/S Loaders which after shipment from the factory have not been altered, changed, repaired, or treated in any manner whatsoever and does not extend to trade accessories though sold or operated with the Company's loader. Trade accessories such as, but not limited to, engines, tires, batteries, are subject to the warranty of their respective manufacturers.

The Company and/or its authorized Thomas dealers shall not be liable for consequential damages or contingent liabilities for the fitness of any Thomas S/S Loader for any particular purpose.

This warranty is expressly in lieu of any other express or implied warranty, condition or guarantee of this Thomas S/S Loader or any part thereof, including any implied warranty or condition of merchantability or fitness and of any other obligations on the part of the Company or the selling dealer.

No representative of the Company has authority to change this warranty in any manner whatsoever and no attempt to repair or promise to repair or improve the Thomas S/S Loader covered by this warranty by any representative of the Company shall waive or change or extend this warranty in any manner whatsoever.

**Effective for machines produced from February 1, 1982*

N.B. Read and practice your Thomas S/S Loader operating and servicing instructions. Failure to do this may void your warranty.

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SPECIFICATIONS

SAFETY **RULES**

1. You must be trained and qualified in the operation of this vehicle.
2. Read the owners and operators manual before starting vehicle.
3. Fasten seat belt before starting loader.
4. Be sure control levers are in neutral and the parking brake engaged before starting or disembarking loader.
5. Keep load low — do not travel or turn with lift arms up.
6. Do not leave loader with engine running, lift arms up or parking brake disengaged.
7. Do not exceed the rated load capacity.
8. Back up all inclines, such as curbs, embankments, ramps, etc.
9. Keep all protective shields in place.
10. Before breaking any hydraulic circuit lower all hydraulic cylinders before the system pressure is relieved.
11. When servicing the machine with arms up engage the boom lock.

SAFETY EQUIPMENT

The Thomas S/S loader is equipped with several items for your protection. They are:

1. Seat belt
2. Roll over protective structure (ROPS) with screen
3. Safety treads for steps
4. Protective shields
5. Parking brake

These items are provided for your safety. Take care of them, and inspect their condition often.

1. Check seat belts for frayed or cut webbing, damaged buckles or loose mounting brackets.
2. Check ROPS for damage or loose mounting. Never remove the protective screens.
3. Keep safety treads clean. Replace them if they become worn or come off.
4. Keep all protective shields in place.

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CONTROLS



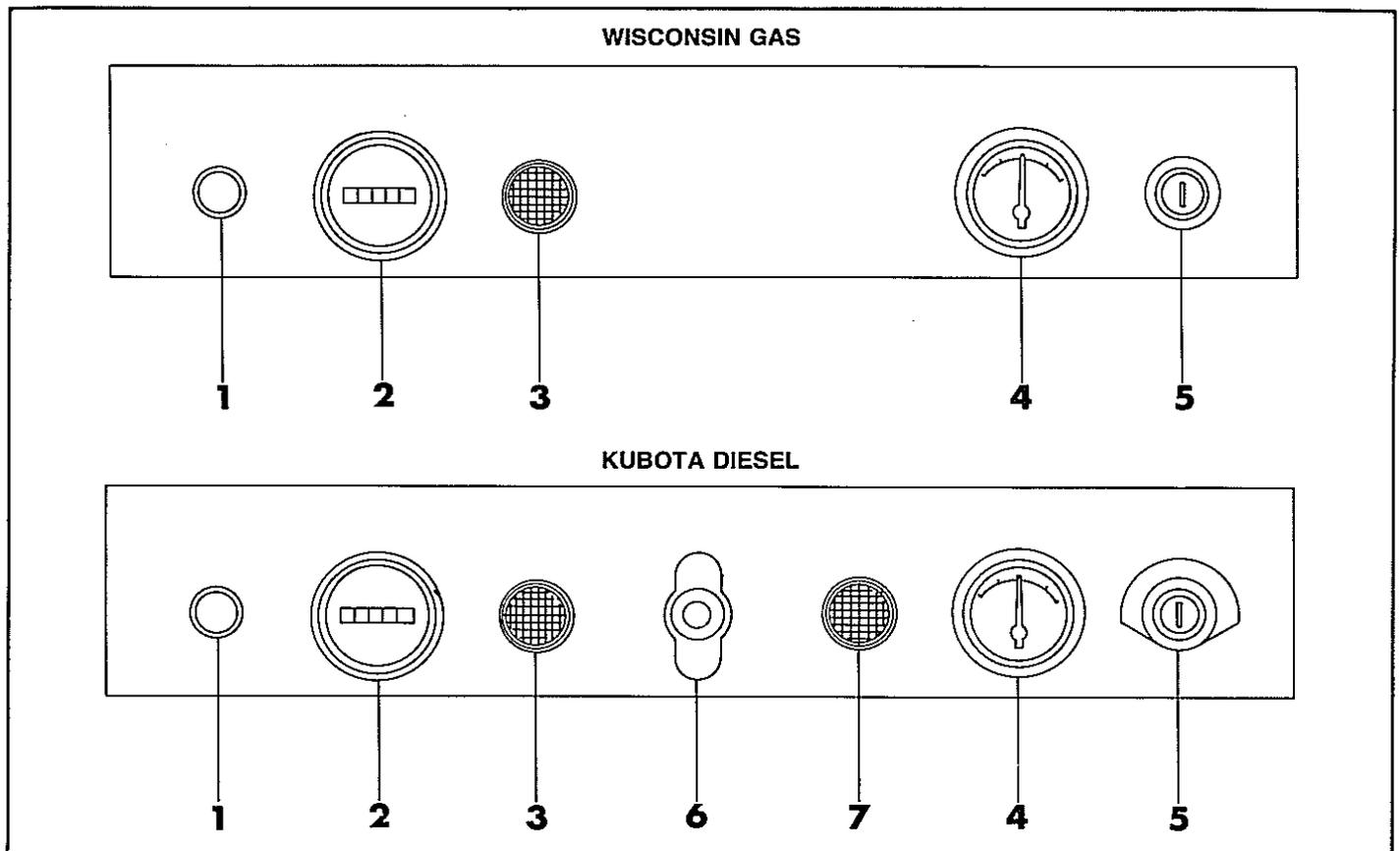
READ THE MANUFACTURER'S OPERATOR MANUAL BEFORE TRYING THE EQUIPMENT. IF THERE IS NO MANUAL WITH THE MACHINE — GET ONE. STUDY IT BEFORE YOU START WORK.

IF THERE IS SOMETHING IN THE MANUAL YOU DON'T UNDERSTAND, ASK YOUR SUPERVISOR TO EXPLAIN IT TO YOU.

IMPORTANT:

This manual covers safe practices for skid-steer loaders equipped with a bucket or pallet forks. If your loader is equipped with a back hoe, broom, earth drill, grapple, pulp wood fork or other device, read the operating and safety manuals prepared for the equipment before using it.

1.1 INSTRUMENT PANEL



1. LIGHT SWITCH (OPTIONAL):

The light switch is a three position switch, off, headlights and rear lights. Pulling the switch out to the first position turns on the two headlights. The second position turns on both headlights and the two rear lights. The instrument panel lights are on when the ignition switch is in the run position.

Protecting the lighting circuit is a 15 amp fuse built into the light switch. The instrument panel must be removed to replace the fuse.

2. HOUR METER:

The hour meter records engine operating hours and has a total readout of 9999.9 hours. The clock winds approximately every 12 seconds and will run for a short time after the engine has been shut off.

3. HYDRAULIC OIL TEMPERATURE LIGHT:

The hydraulic oil temperature sender, which is mounted in the collector manifold, measures the temperature of the oil in the hydrostatic transmission drain lines. If the light comes on during operation shut down the machine. Refer to trouble shooting chart.

4. AMMETER:

The ammeter indicates current flow into (charge) or out of (discharge) the battery. With the ignition switch on and the engine running, the needle should deflect towards charge and return toward centre if the battery is fully charged.

5. IGNITION SWITCH — WISCONSIN TJD:

The ignition switch is a key operated three position switch, off, ignition and start.

5. IGNITION SWITCH — KUBOTA D850B:

The ignition switch is a key operated four position switch, off, preheat, run and start. Turning the key as far as possible counter clockwise activates the glow plugs. To engage the starter turn the key clockwise.

6. PRE-HEAT INDICATOR:

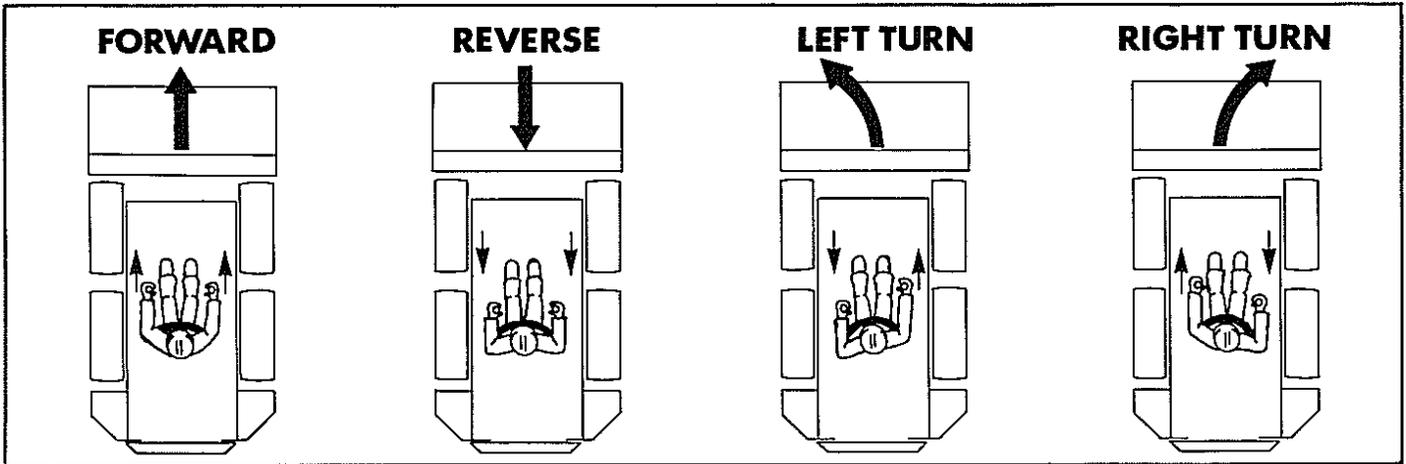
The Kubota diesel engine is equipped with glow plugs to assist in starting. The glow plugs are activated by turning the ignition key counter clockwise as far as possible and held in this position. The glow plug indicator will turn red when the air in the combustion chamber has reached the proper temperature for starting.

WARNING: DO NOT USE ETHER OR ANY STARTING DEVICE THAT USES HIGH ENERGY FUELS IN CONJUNCTION WITH AN ENGINE EQUIPPED WITH GLOW PLUGS.

7. ENGINE OIL PRESSURE LIGHT:

The light will come on if there is insufficient oil pressure and the engine should be shut off immediately. Refer to the engine manual and trouble shooting charts.

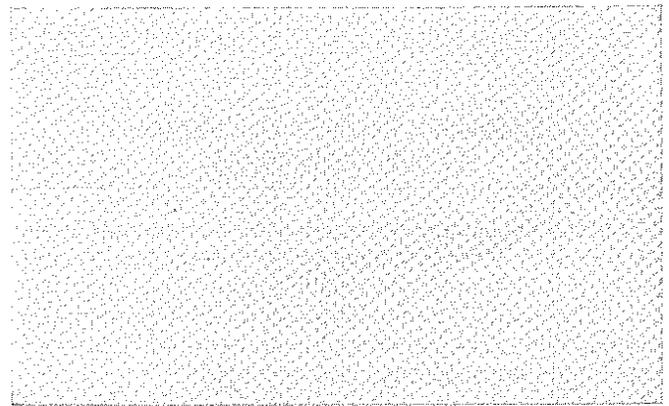
1.2 STEERING CONTROLS



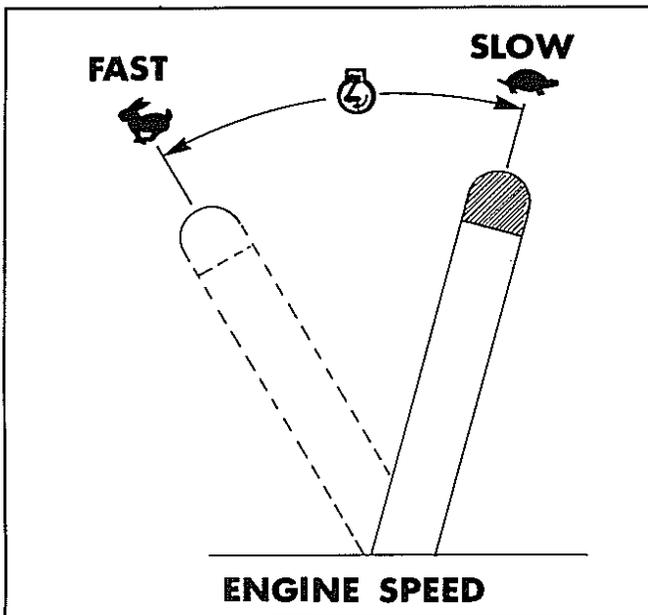
The steering levers control the forward, reverse, turning and speed of the machine. Both levers are pushed ahead for forward travel and both are pulled back for reverse. The further forward or back the levers are moved from the centre or neutral position, the faster the machine travels.

The machine is steered by moving one lever further ahead than the other. Moving the left lever further ahead than the right causes the machine to turn to the right. Moving the right lever ahead of the left causes the machine to turn to the left.

For the machine to turn or "skid steer" within its own length, one lever is moved forward and the other back. This causes the wheels on one side to turn forward and the wheels on the opposite side to reverse turning the machine.



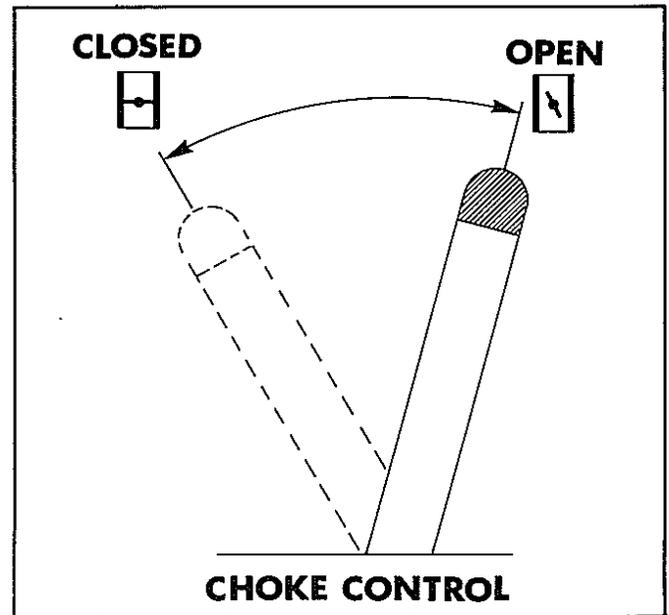
1.3 THROTTLE CONTROL — GAS



The throttle control is mounted on the right hand side of the machine next to the operators seat. When the throttle control is set fully back the engine is at idle speed. Moving the control forward increases the engine speed. The machine should always be operated with the throttle fully open.

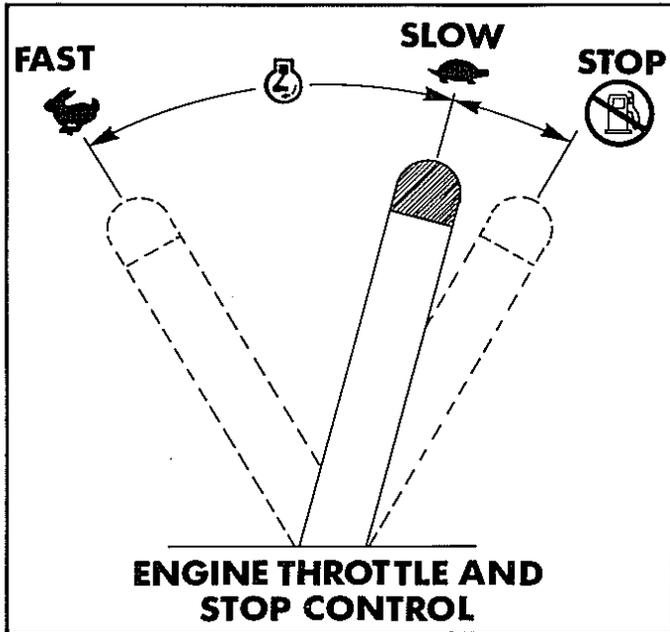
Before shutting off the engine, return the throttle control to idle position and allow the engine to cool.

1.4 CHOKE:



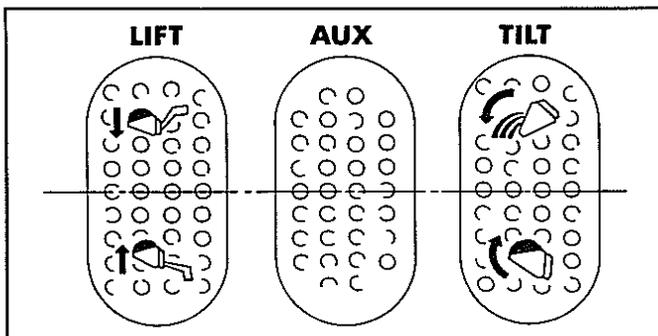
The choke control is mounted on the right hand side of the machine next to the throttle control. To close the choke push the lever forward. When the engine starts, pull the lever back opening the choke.

1.5 DIESEL THROTTLE AND STOP CONTROL:



The diesel throttle and stop control are incorporated in one lever located on the right hand side of the machine. Pushing the lever full forward increases the engine RPM to max. high idle. Pulling the lever back until resistance is felt decreases the engine RPM to low idle. Pulling firmly back on the lever will shut off the fuel supply stopping the engine.

1.6 FOOT PEDALS:



Operation of the boom lift cylinders, bucket tilt cylinders and auxiliary hydraulic circuit are controlled by foot pedals connected to a hydraulic control valve. The hydraulic control valve is a series type valve which allows for simultaneous use of both the boom lift and bucket tilt circuits. The control valve is equipped with a 2000 p.s.i. relief valve for circuit protection.

Each of the pedals is equipped with a grease fitting and should be lubricated on a regular basis to prevent them from binding and sticking. Refer to the maintenance section for more information.

Operation of each of the foot pedals is as follows:

LIFT CONTROLS:

The L.H. pedal is the lift (boom) control pedal. Depressing the heel raises the boom. Pressing the toe of the pedal lowers the boom. Firm pressure on the toe of the pedal places the boom into "float" position allowing it to follow rough ground.

AUXILIARY HYDRAULIC CONTROL:

The centre pedal is used to engage the auxiliary hydraulic circuit to power an attachment such as a backhoe. Pressing firmly on the toe of the pedal places the valve in detent position. When the auxiliary circuit is not in use be sure the pedal is returned to neutral or centre position, otherwise starting the loader may be difficult or impossible.

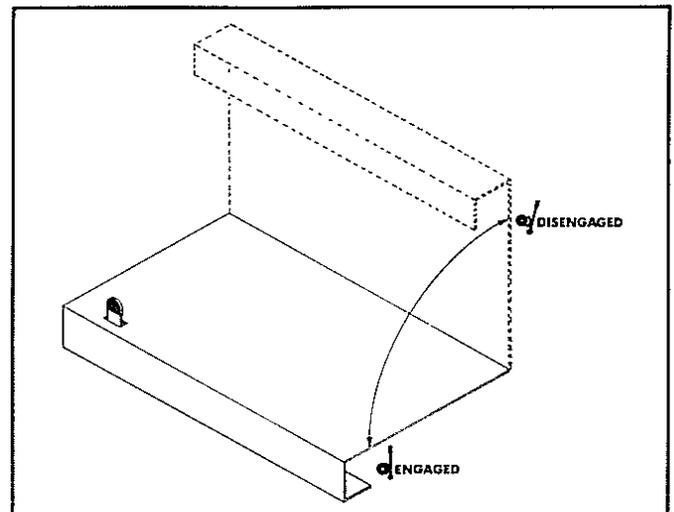
TILT CONTROL:

The R.H. pedal is the tilt (bucket) control pedal. Press the toe of the pedal to dump the bucket and press the heel to roll the bucket back.

1.7 PARKING BRAKE

The loader is equipped as standard equipment with two mechanical, caliper type disc brakes. The brakes are mounted on the rear loader axles.

Both brakes are engaged by releasing the front shield catch and stepping down on the shield until it locks in the down position. The front shield serves the dual purpose of both engaging the parking brakes while at the same time covering



the foot pedals so that they cannot be accidentally cycled while entering or leaving the loader.

CAUTION: ALWAYS ENGAGE THE PARKING BRAKE BEFORE STARTING THE LOADER.

DO NOT PARK ON A SLOPE. IF NECESSARY TO PARK ON A SLOPE, PARK ACROSS THE GRADE, ENGAGE THE PARKING BRAKE, GROUND THE BUCKET AND BLOCK THE WHEELS.

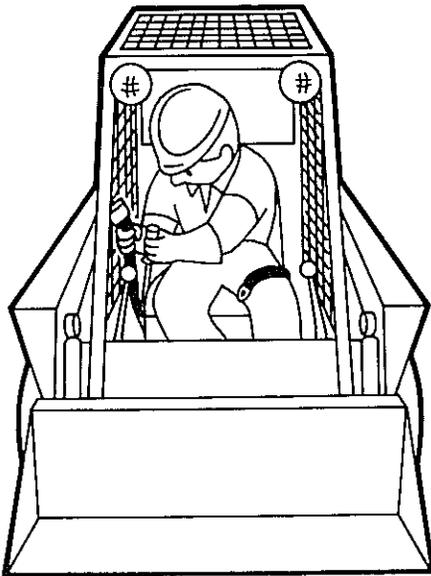
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STARTING INSTRUCTIONS

Use All Available Safety Devices

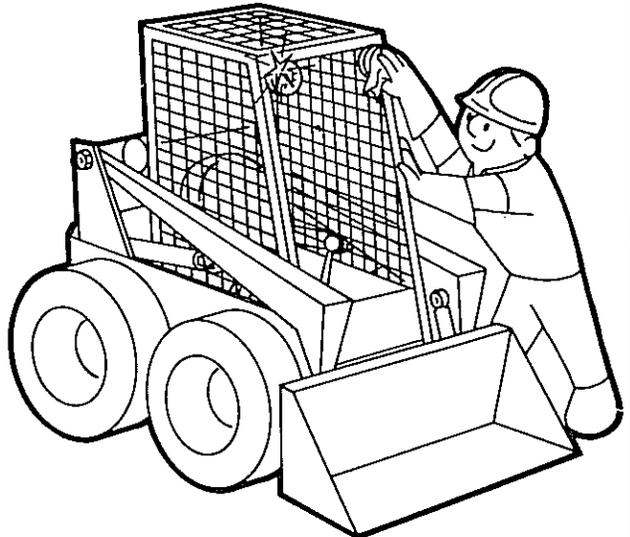
Keep all protective devices in place and tightly fastened. Make certain all guards, side screens or panels, and safety signs are installed on the loader as recommended by the manufacturer.



Clean Up

Keep work surfaces and engine compartments clean. Flammable materials not cleaned from hot engine parts can burn.

Clean any windows, windshields and lights and make sure wipers operate properly. Check doors and curtains. Remember, visibility in all directions is important.



2.1 PRE-STARTING INSPECTION

Before starting the loader complete the following inspection.

- (1) Check the hydraulic oil level, engine oil level, engine coolant level and fuel supply.
- (2) Check the air filter indicator and empty the vacuator cup at the bottom of the air cleaner body.
- (3) Check for fuel, oil and hydraulic leaks.
- (4) Check lights, battery level and cables.
- (5) Check tire pressure:
STANDARD . . . 50 P.S.I. (345 KPa)
FLOATATION . . . 30 P.S.I. (207 KPa)
- (6) Check wheel bolt torque .80-90 ft. lbs. (109-122 N.M.)
- (9) Check the condition and operation of all safety equipment — Ensure all shields and safety screens are in place. If necessary repair or replace before starting.

2.2 STARTING — GAS

- (1) Fasten the seat belt securely.
- (2) Place the control levers in neutral position and engage the parking brake.
- (3) Check that the auxiliary foot pedal is in neutral position
- (4) Move the throttle $\frac{1}{4}$ way forward.
- (5) Push the choke lever full forward (not necessary on warm engine)
- (6) Turn the ignition key clockwise to start position. Do not run the starter for more than 30 seconds. Allow the starter to cool for one minute before re-engaging the starter.
- (7) As the engine warms up gradually return the choke control to off position.

Allow the engine to warm up for five minutes before operating the loader. Raise and lower the boom and operate the bucket to check hydraulic functions.

Before beginning operation, advance the throttle to full on position and disengage the parking brake.

To shut off the engine turn the ignition key to off position.

2.3 STARTING — DIESEL

1. Fasten the seat belt securely.
2. Place the steering control levers in neutral position and engage the parking brake.
3. Check that the auxiliary foot pedal is in neutral position.
4. Move the throttle control $\frac{1}{4}$ way forward.
5. Turn the ignition key counter clockwise to activate the glow plugs. Hold until the pre-heat indicator turns red. The engine oil pressure light should be on.
6. Turn the ignition key clockwise to the start position

engaging the starter. Do not crank the starter for more than 15 seconds. If the engine fails to start turn the key counter clockwise and pre-heat again.

When the engine starts the oil pressure light will go out. If it doesn't shut the engine off immediately and investigate the cause.

Allow the engine to warm up five minutes before operating the loader. Raise and lower the boom and operate the bucket controls to check hydraulic functions.

Before beginning operation, advance the throttle to full on position and disengage the parking brake.

To shut off the engine return the throttle lever to idle position then firmly pull the lever back to stop position — turn the ignition key to off position.

WARNING: DO NOT USE ETHER OR ANY STARTING DEVICE THAT USES HIGH ENERGY FUELS IN CONJUNCTION WITH AN ENGINE EQUIPPED WITH GLOW PLUGS.

2.4 SHUT OFF PROCEDURE

GAS — Return the throttle lever to idle (back) position. If the engine is hot allow it to idle until cool. Turn the ignition key to off position to stop engine.

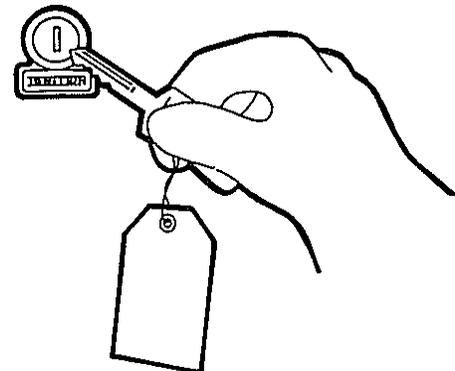
DIESEL — Return the throttle control to idle (back) position. If the engine is hot allow it to idle until cool. To stop the engine firmly pull the throttle control back to stop position. Turn the ignition key to off position.

ALWAYS LOWER THE LIFT ARMS, GROUND THE BUCKET AND ENGAGE THE PARKING BRAKE BEFORE LEAVING MACHINE.

Safe Shutdown Procedures

Correct shutdown is important to safe operation. Refer to your manufacturer's manuals. Follow these general steps.

- Lower or restrain the lift arms.
- Lower the blade, bucket or forks to the ground.
- Place the controls in PARK or NEUTRAL.
- Set the parking brake
- Idle engine for gradual cooling.
- Shut off engine.
- Cycle all hydraulic controls to eliminate pressure.
- Lock the ignition and remove the key. Lock covers and closures.



3 LOADER OPERATION

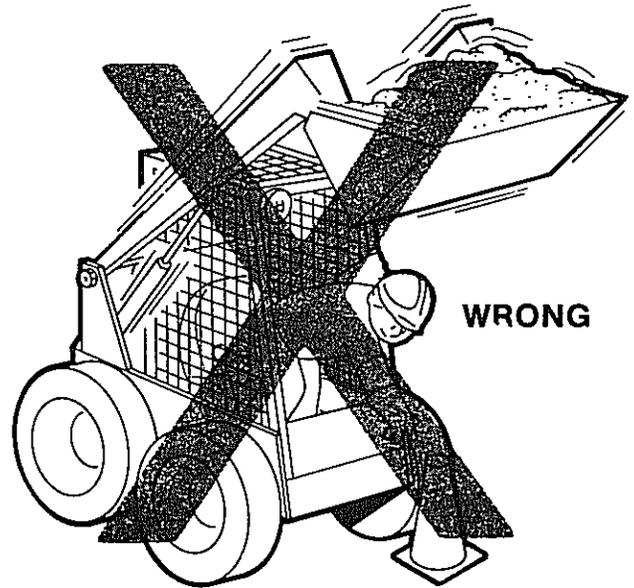
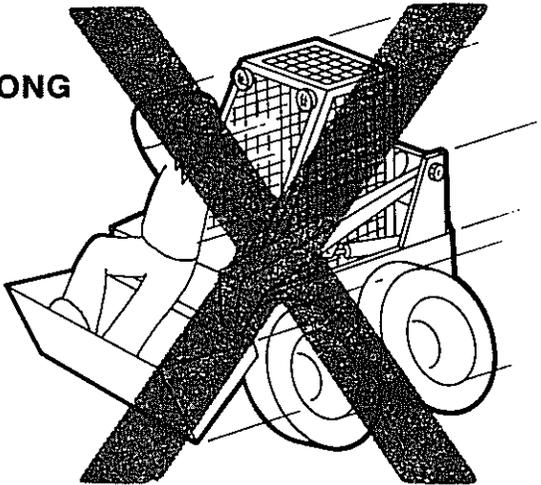
- 3.1 FILLING FROM A PILE
- 3.2 DIGGING WITH A BUCKET
- 3.3 LEVELING AND BACK FILLING
- 3.4 OPERATIONAL HINTS

Follow Safe Operating Practices

- Keep your seat belt fastened.
- Never leave the operator's seat without first lowering the bucket — or engaging the lift arm stops — and shutting off the engine.
- Operate the controls smoothly — don't jerk the steering levers.
- Avoid sudden stops, starts or turns.
- Never "cowboy" or play games with a loader.
- Never attempt to work the controls unless properly seated.

LOADER
OPERATION

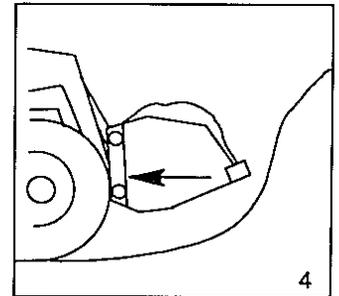
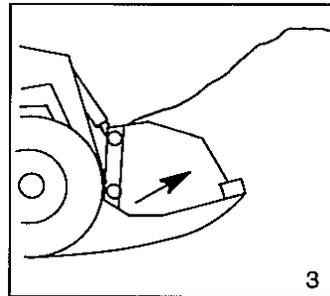
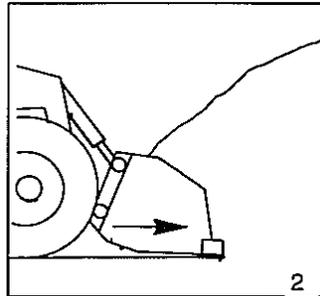
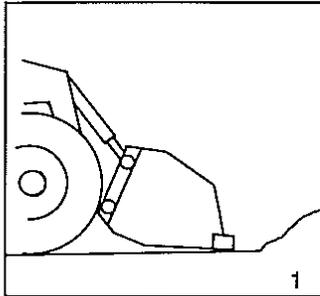
WRONG



WARNING: Keep your body inside the operator's compartment while operating the skid-steer loader. Never work with your arms, feet or legs beyond the operator's compartment.

Stay alert. Should something break, come loose, or fail to operate in your equipment, stop work, shut off the engine and inspect the machine.

3.1 FILLING BUCKET FROM A PILE

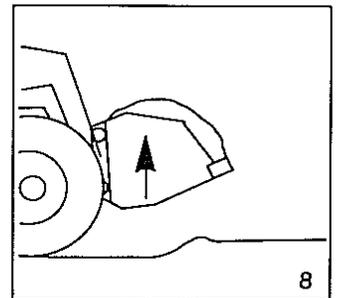
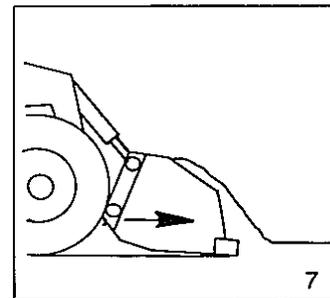
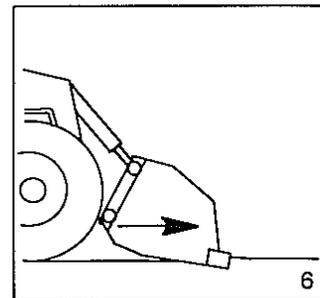
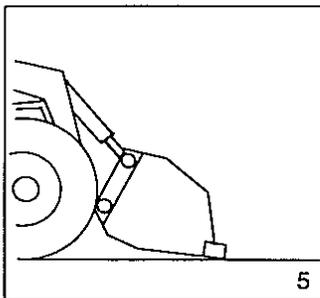


To fill the bucket from a pile:

1. Place the lip (cutting edge) of the bucket on the ground. (Fig. 1)
2. Drive forward. As the bucket fills, pull back gradually on the operating levers to decrease speed and increase force. (Fig. 2)

3. As you drive forward, raise the boom and roll the bucket lip up to fill it. (Fig. 3)
4. Roll the bucket as far back as it will go and back away from the pile. (Fig. 4)

3.2 DIGGING WITH A BUCKET

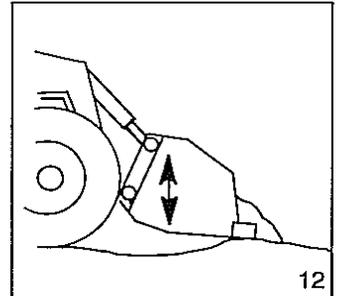
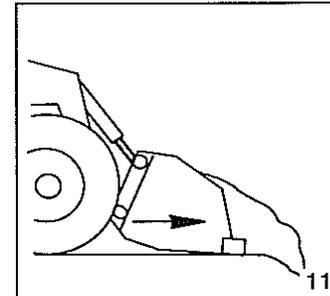
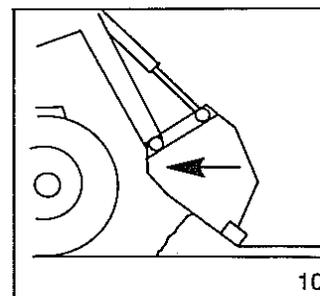
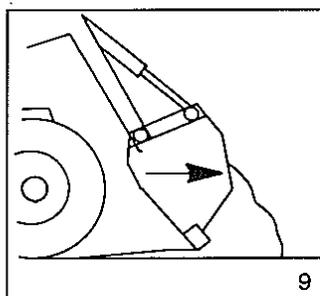


To dig into hard ground:

1. Raise the boom slightly and tip the bucket down until it contacts the ground. (Fig. 5)
2. Drive forward to penetrate the ground. Bring the boom down as you drive forward. (Fig. 6)

3. Raise the bucket slightly to increase traction and to maintain a uniform depth. (Fig. 7)
4. Continue driving forward until the bucket is filled. (Fig. 7)
5. When the bucket is filled, roll it back as far as it will go. (Fig. 8)

3.3 LEVELING AND BACKFILLING



1. Spread dirt by driving forward with the bucket slightly raised off the ground and tilted down. (Fig. 9)
2. To level tilt the bucket down, raise the front slightly off the ground and drive backward. (Fig. 10) Float position in the boom control works well on some leveling jobs.

3. Fig. 11 shows filling holes in rough ground.
4. Place the boom control in float position to let the bucket follow uneven ground. (Fig. 12)

3.4 OPERATIONAL HINTS

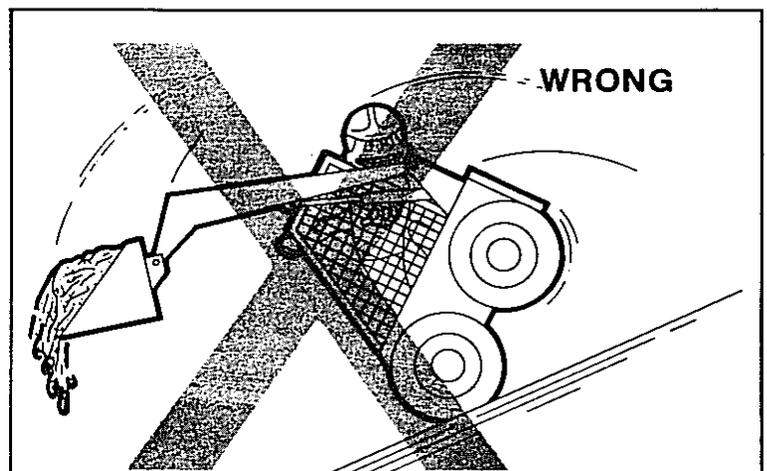
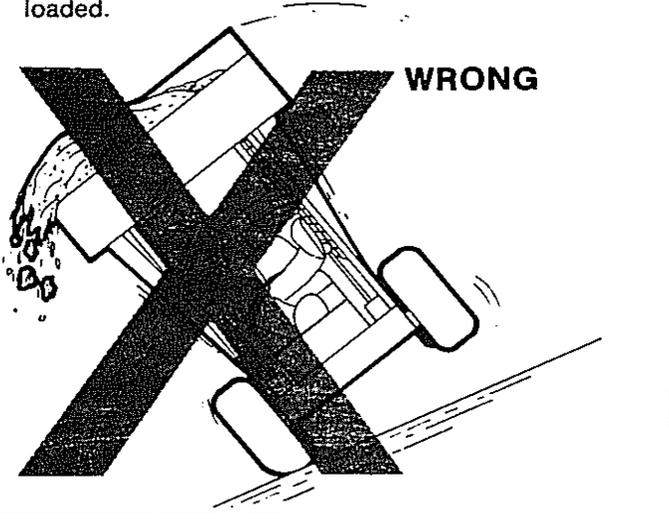
1. Take full advantage of the skid-steered loaders maneuverability. Keep hauling distances as short as possible. Keep the work area small to keep cycle time short.
2. Keep the working area as level as possible.
3. The loader will handle much better with a full bucket than with a partial load.
4. Cycle time can be reduced by using a "pivot-spin" instead of a conventional "stop-and-go" turn.

Work Safely

Whenever possible, work from a level surface. Use extreme caution on slopes and grades.

Never ram the bucket into a material pile. Never lift an uneven load. Pick up carefully. Be ready to lower quickly if your skid-steer loader becomes unstable.

If traveling either up or down a slope, grade or ramp, ALWAYS have the heavy end of your loader uphill for stability. Check manufacturer's recommendation. Some loaders are heavy on rear when unloaded and heavy on front when fully loaded.



If you are working on a ramp or slope always have a flat, level turn-around area so you can turn, load and unload safely.

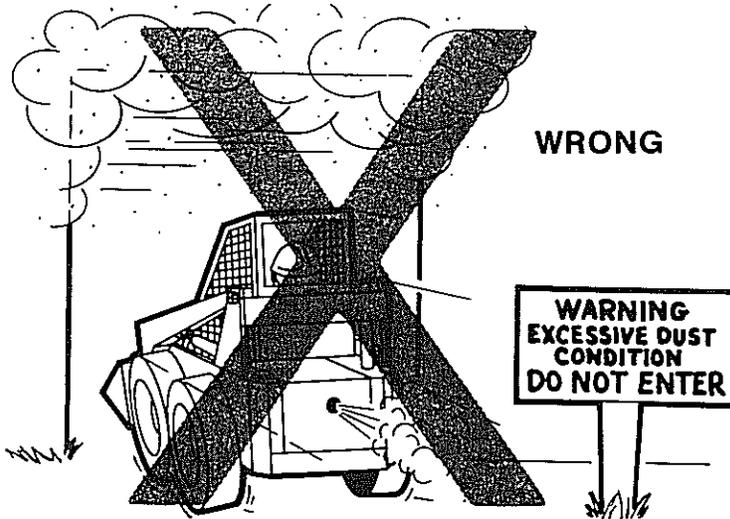
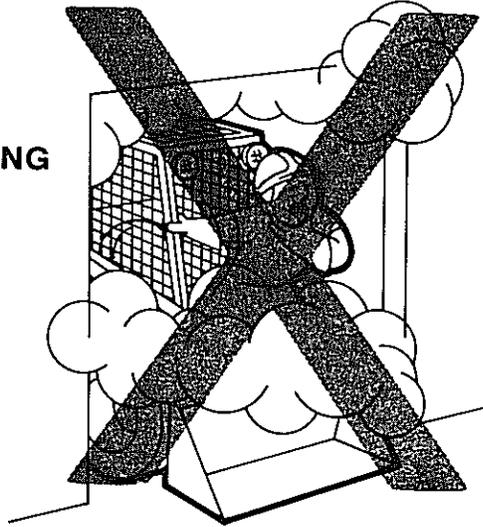
IMPORTANT: KEEP A LOAD AS LOW AS POSSIBLE. The center-of-gravity of your skid-steer loader shifts as loads are lifted and lowered. Never attempt to make sharp turns or travel on steep slopes with a raised load.

Make sure you can see where you are going. Never travel with a load obstructing your vision.

Exhaust Gases Can Kill

Exhaust fumes from diesel, gasoline or LP gas engines can kill. Always use with adequate ventilation.

WRONG



WRONG

Avoid Explosions And Fires

Loaders with diesel, gasoline or LP gas fuels have hot engine parts with hot exhaust gas with sparks or flames. Electric systems may have arcs or sparks at electrical contacts. Do not use these loaders in atmospheres with explosive dusts or gases, or where exhausts can contact flammable materials, unless loader has special equipment approved for this usage. Keep flammable materials away from engine parts.

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- 4.7 TIRE MAINTENANCE
- 4.8 TIRE ROTATION AND REPLACEMENT

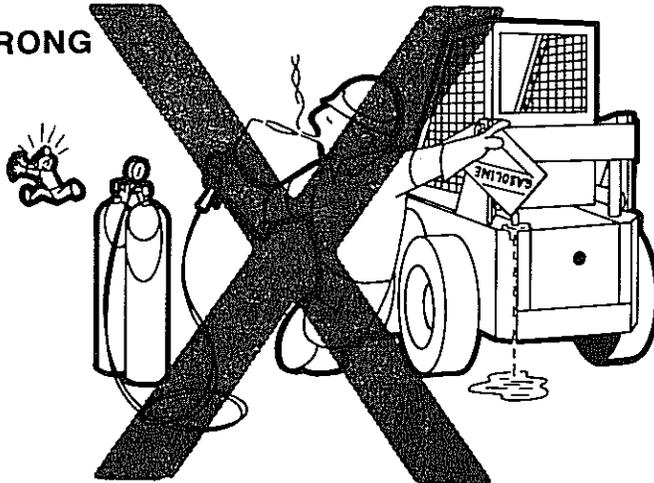
Use Caution When Fueling

WARNING: NEVER FILL THE FUEL TANK WITH THE ENGINE RUNNING, WHILE SMOKING OR WHEN NEAR AN OPEN FLAME.

Never overfill the tank or spill fuel. If fuel is spilled, wipe it up immediately.

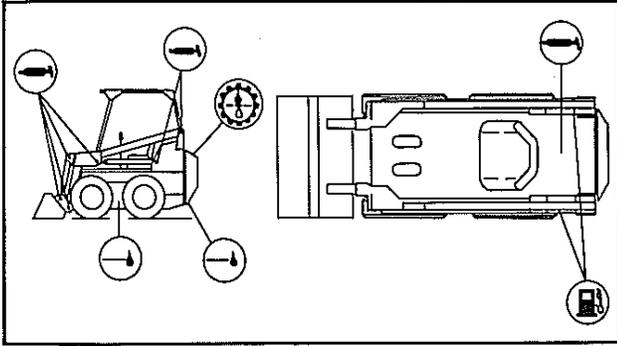
Ground the fuel funnel or nozzle against the filler neck to prevent sparks and be sure to replace the fuel tank cap.

WRONG



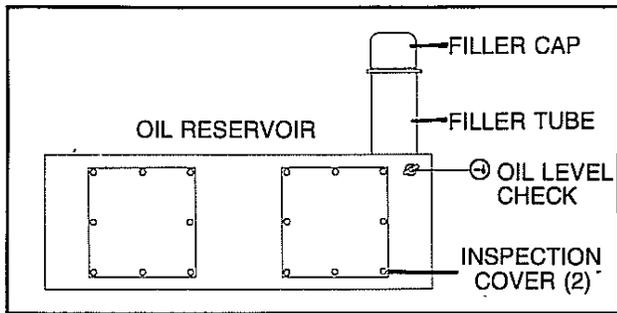
**GENERAL
MAINTENANCE**

4.1 LUBRICATION



There are fourteen grease fittings on the loader which should be lubricated every eight to ten hours using a good quality multi-purpose lithium based grease. Apply grease until excess shows. Refer to the service schedule for complete service details.

4.2 HYDRAULIC OIL RESERVOIR



The hydraulic oil reservoir which is part of the main frame is located inside the rear door beneath the engine.

The hydraulic reservoir supplies oil to the hydraulic gear pump which powers the boom, bucket and auxiliary hydraulic circuits. Oil from the reservoir also supplies the hydrostatic transmission charge pump.

The reservoir oil level should be checked on a daily basis. A shut off cock is fitted to the reservoir for this purpose. The reservoir is filled with 10W30 A.P.I. service SE, CD oil. Total capacity is 12 U.S. gal. (45 l). Use of any other oil or transmission fluid can seriously damage the hydrostatic pumps and motors.

In the event of hydrostatic transmission failure the oil reservoir as well as all hydraulic lines leading to and from the hydrostatic pumps and motors must be drained and flushed before placing the machine back into service. This **MUST** be done to remove any contamination from the system otherwise transmission failure may reoccur.

To flush the reservoir first drain it of all oil. The drain plug is located on the bottom front of the tank directly behind the rear wheel. Remove the inspection covers on the side of the tank inside the rear door. Wash the inside of the reservoir thoroughly with any oil base solution to remove any metal particles or other forms of contamination. When the reservoir is dry, use a magnet to remove any remaining particles.

Replace the drain plug, inspection covers and reconnect all hydraulic lines. Fill the reservoir with new clean oil to the correct level.

When the reservoir oil is replaced care must be taken in the proper selection as oil used in the hydrostatic drive system must perform the dual function of lubrication and transmission of power. **NEVER** use a hydraulic oil or transmission fluid in the system as some fluids do not possess sufficient lubricating properties and transmission damage will occur. Use only 10W30 A.P.I. service SE, CD oil.

4.3 HYDRAULIC OIL FILTER

The hydraulic oil filter is a 25 micron, spin on element filter. The filter is mounted on the left hand fuel tank.

The filter should be replaced after the first 50 hours of operation and every 200 hours thereafter. In extremely dusty applications the filter should be changed every 100 hours.

Replace with Fram filter P1654.

4.4 FINAL DRIVE TRANSMISSION HOUSING

The final drive transmissions do not require any servicing other than routine checks.

The oil level should be checked during predelivery, 50 hour check and during scheduled service inspections. An oil level plug is located in each transmission on the inspection cover plate between the tires. If oil must be added use 10W30 A.P.I. service SE, CD. The capacity of each transmission housing is approximately 2.5 U.S. gal. (9 l).

The axles should be inspected periodically for end play. The axle bearings are preloaded and the axle must have no end play. To check, block the loader securely with wheels clear of the ground. Gripping the top and bottom of the tire pull to determine if end play exists. To preload the bearings remove the axle end cover located on the final drive housing on the inside of the loader. Remove the split pin and tighten the 3/4" castle nut.

4.5 ENGINE COOLING SYSTEM

WISCONSIN TJD AIR COOLED GAS:

Engine cooling is accomplished by a flow of air circulated over the cylinders and heads of the engine, by a combination fan-flywheel encased in a sheet metal shroud. The air is divided and directed by ducts and baffle plates to ensure uniform cooling of all parts. The ducts and baffle plates must be kept clean and free from obstructions.

This can be accomplished by a daily blast of air, proper repair of all shrouding and eliminating oil leaks and dents.

CAUTION:

NEVER OPERATE AN ENGINE WITH ANY PART OF THE SHROUding REMOVED, AS THIS WILL RETARD THE AIR COOLING.

KUBOTA D850B WATER COOLED DIESEL:

The engine is cooled by water circulation through passages in the cylinder block and cylinder head. To obtain maximum efficiency and service life, the engine must be run at the correct temperature. The cooling system should be checked daily and kept filled with clean water and rust inhibitor or anti-freeze solution.

Add rust inhibitor to the cooling system if the anti-freeze solution does not contain a rust inhibitor. The radiator should be filled to a level of 1 to 1 1/2 inches below the bottom of the filler neck.

CAUTION:

The cooling system is under pressure. Therefore, it is dangerous to remove the radiator cap while system is hot. Always turn the cap slowly to the first stop and allow the pressure to escape before removing the cap completely.

4.6 AIR FILTER

The air cleaner is mounted on the left hand side of the machine inside the rear door.

The high efficiency of the air cleaner will provide long engine life under operating conditions where dust is the principle cause of engine wear.

The air cleaner dust cup should be emptied daily or more often if required. The air cleaner system is fitted with a service indicator mounted on the air intake tube. When the indicator shows 'red' it is time for air cleaner maintenance. The air cleaner element can be serviced by back flowing with

compressed air (100 psi max.) or washing in water and Donaldson D1400 filter cleaner. This feature multiplies the usable life of the filter and cuts maintenance costs substantially.

4.7 TIRE MAINTENANCE

Tire pressures must be to the following specifications and equal in all four tires.

STANDARD TIRES 5.90 x 15.....50 PSI (345 KPa)
FLOATATION TIRES 27 x 8.5 x 15 .30-35 PSI (207-241 KPa)

If tire pressure is below 50 P.S.I. the machine will be hard to turn and tire wear will be much greater. Floatation tires should be inflated to 30 P.S.I. but can be inflated to 50 P.S.I. to improve operation on hard surfaces.

4.8 TIRE ROTATION AND REPLACEMENT

If both rear or both front tires wear excessively, rotate them to the opposite end of the machine.

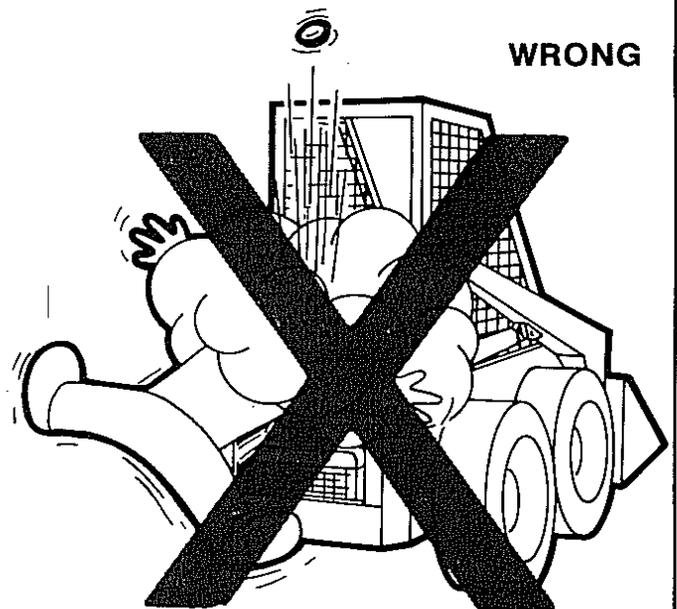
This should be done as soon as wear is noticed. Excessive wear may be caused by incorrect inflation, improper bucket size for the loader application or by improper operation.

If a damaged or worn tire is to be replaced, it is important that the replacement is the same size as the tires on the loader. Two different tire sizes on the same side of the machine will cause undue drive chain wear, tire wear and loss of power. If two new tires are purchased to replace two worn ones, put them on the same side.

Be Careful With Fluids Under Pressure

Cooling system pressure builds up as the engine gets hot. The hydraulic system is under pressure whenever the engine is running and may hold pressure even after shutdown.

Shut down the engine and permit it to cool to relieve cooling system pressures. Cover the radiator cap with a cloth and let steam or vapor escape gradually.



Avoid Fire and Explosion Hazards

Treat all solvents and dry chemicals with respect. Work in a well-ventilated area. Make sure you know where the fire extinguishers are kept and how to use them.

Use a non-flammable solvent to clean machine parts. Never use gasoline or diesel fuel.

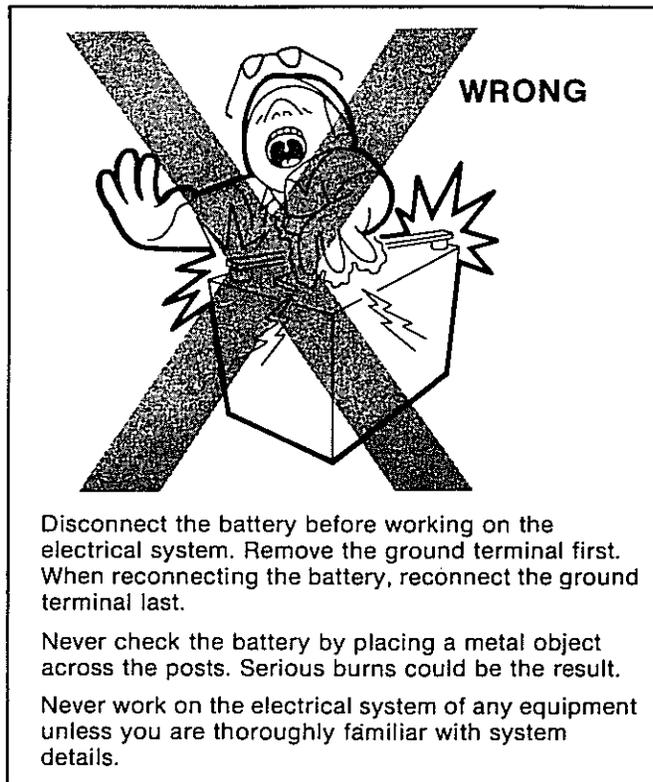
WARNING: NEVER SMOKE WHILE HANDLING FUEL OR WORKING ON THE FUEL SYSTEM. THE FUMES IN AN EMPTY FUEL CONTAINER CAN BE DANGEROUSLY EXPLOSIVE.

Avoid spilling fuel. If a spill occurs, wipe it up immediately.



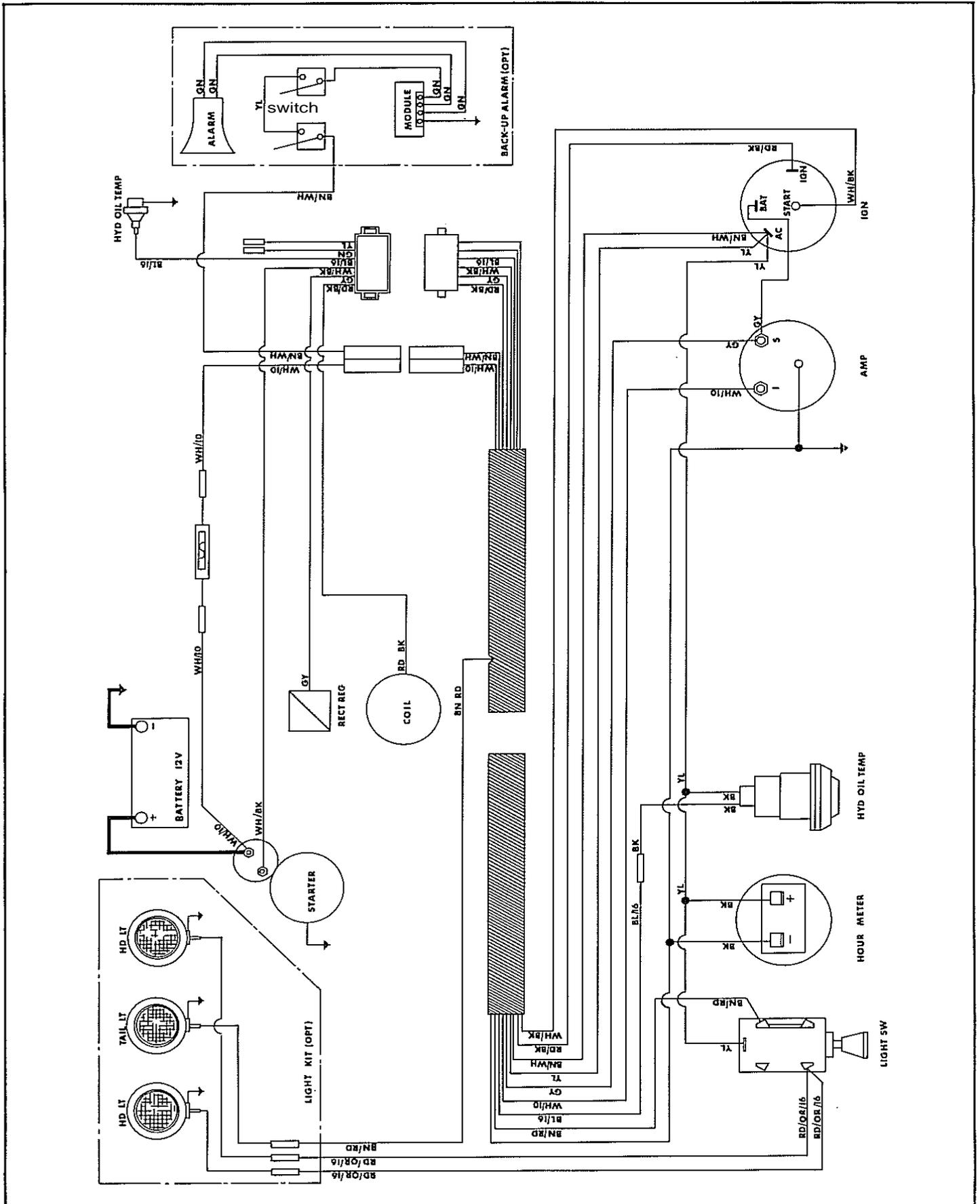
5 ELECTRICAL SYSTEM

- 5.1 ELECTRICAL SYSTEM — WISCONSIN TJD
- 5.2 ELECTRICAL SYSTEM — KUBOTA D850B

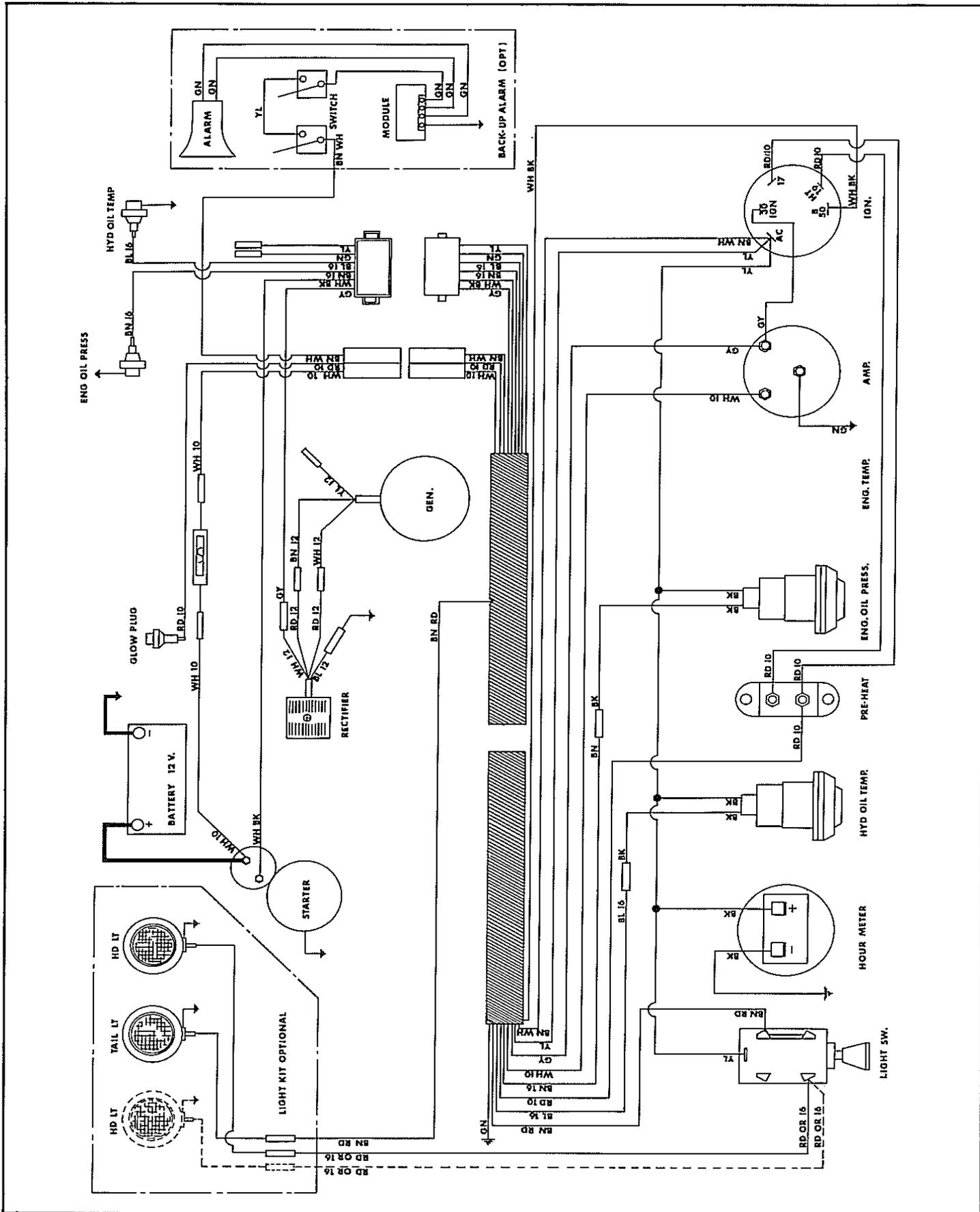


ELECTRICAL
SYSTEM

5.1 ELECTRICAL SYSTEM — WISCONSIN TJD



5.2 ELECTRICAL SYSTEM — KUBOTA D850B

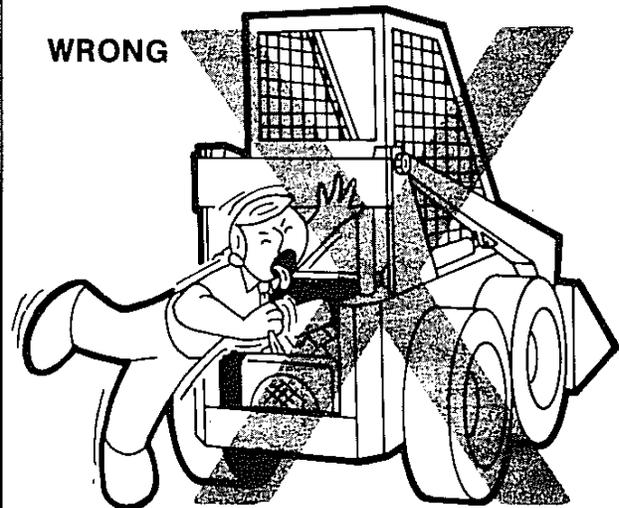
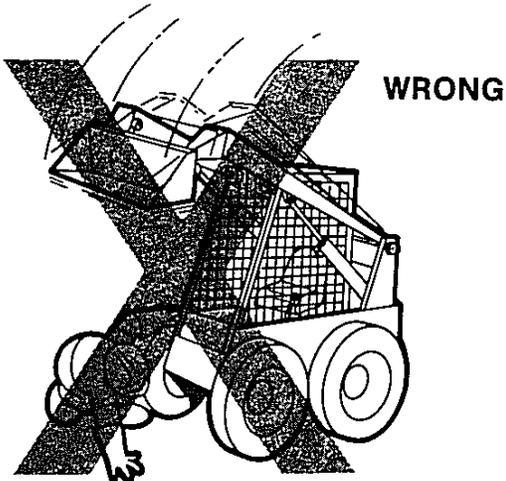


Prepare The Machine

Move the machine onto a level surface. Shut off the engine, release all hydraulic pressure. (SEE SHUTDOWN PROCEDURE,) Block all hydraulically operated attachments. Place controls in Neutral.

WARNING: Never work on machinery with the engine running unless all appropriate safety precautions are observed.

WARNING: Never operate the engine without proper ventilation — EXHAUST FUMES CAN KILL.



Never wear a watch or ring or a necktie around machinery. Keep your hands, clothing — and your hair — away from moving parts.

6 SERVICE

- 6.1 PREDELIVERY SERVICE/50 HOUR SERVICE
- 6.2 PREVENTIVE MAINTENANCE SCHEDULE
- 6.3 FUEL SELECTION
- 6.4 HYDRAULIC/HYDROSTATIC CIRCUIT
- 6.5 HYDRAULIC SPECIFICATIONS
- 6.6 TORQUE SPECIFICATIONS

Don't Take Chances

Tighten all bolts, fittings and connections to torques specified by the manufacturer.

Replace all guards, covers and shields.



SERVICE

6.1 PRE-DELIVERY INSPECTION/ 50 HOUR SERVICE

Engine	Max. no load RPM
Wisconsin TJD	2800
Kubota D850B	2800

1 ENGINE

1.1 OIL FILTER:

Change the engine oil filter on the Kubota D850B engine. The engine oil filter should be changed every 150 hours thereafter. Use filter number 18717 (Kubota no. 15241-3209-2)

1.2 ENGINE OIL:

Change the engine oil after the first 50 hours of operation. Use the following crankcase oils.

Engine	Oil Type
Wisconsin TJD	10W30 A.P.I. SERVICE SE, CC
Kubota D850B	10W30 A.P.I. SERVICE SE, CD

The following are recommended maximum times between changes.

Engine	Initial Chg.	Change Every	Sump Capacity
Wisconsin TJD	50	50	3.5 U.S. Qts. (3.5 l)
Kubota D850B	50	75	4.5 U.S. Qts. (4.5 l)

1.3 ENGINE OIL LEVEL:

Check that the engine oil level is to the proper level on the dipstick. Engine oil level should be checked daily or more often is possible.

1.4 COOLANT LEVEL:

Check that the coolant is to the proper level in the radiator. The cooling system is filled with a 50% mixture of ethylene glycol and water. Cooling system capacity on the Kubota D850B engine is 1 gal. (4.5 l).

1.5 RADIATOR FOR LEAKAGE, DIRT:

If necessary flush the radiator with air. A dirt buildup on the radiator can lead to overheating of the engine and hydraulic system.

1.6 FUEL SYSTEM FOR LEAKS AND CONTAMINATION:

Make a visual inspection of the fuel system for leaks and potential hazards such as fuel line(s) touching the exhaust manifold, flywheel, etc. Refer to the engine manual for recommended filter replacement schedule and procedures.

1.7 FAN BELT TENSION AND CONDITION:

Refer to the engine manual for proper belt tightening or replacement procedures.

Engine	Deflection	Tension
Kubota D850B	0.25/0.35 in. (7-9 mm)	20 lbs. (9 Kg)

1.8 AIR INTAKE AND CLEANER SYSTEM:

Visually inspect the air cleaner system and ensure all hose clamps are secure and that the air filter indicator has been installed and is not indicating that filter service is required.

1.9 EXHAUST SYSTEM:

Visually inspect the exhaust system and ensure all clamps are secure and the manifold bolts/nuts are tight.

1.10 ENGINE SPEED:

Check and if necessary reset the maximum no load engine RPM.

2 HYDRAULIC/HYDROSTATIC

2.1 HYDRAULIC OIL FILTER:

The hydraulic oil filter must be changed after 50 hours of operation. The oil filter should be changed every 200 hours thereafter. On extremely dirty applications change the filter every 100 hours or sooner.

To install, lubricate the seal with system fluid and screw on hand tight. Use filter number 8724 (FRAM P1654).

2.2 RESERVOIR OIL LEVEL:

Check the oil level by opening the check cock located on the oil reservoir inside the rear door.

If additional oil is required use only 10W30 A.P.I. SERVICE SE, CD. Reservoir capacity 12 U.S. gal. (45 l).

2.3 HOSES AND PIPES:

Make a visual inspection of all hydraulic lines and fittings checking for leaks. Also ensure steel lines are not touching one another.

2.4 CYLINDERS:

Inspect cylinders for leaks. Extend cylinders and check rods for damage.

2.5 HYDRAULIC FUNCTIONS:

Check that the following operate properly: control valve float position, auxiliary detent, hydraulic cylinders.

2.6 PUMPS AND MOTORS, LEAKAGE:

Inspect the pumps and motors to ensure there are no leaks between the sections or at the end caps.

3 FINAL DRIVE

3.1 OIL LEVEL:

Check the final drive oil level. If oil is added use 10W30 API SERVICE SE/CD. Transmission capacity is 2.5 U.S. gal. (9 l).

3.2 AXLE END PLAY:

The axle bearings are pre-loaded and must not have any end play. To check, block the loader securely with all four wheels clear of the ground. Gripping the top and bottom of the tire determine if end play exists.

To pre-load the bearings remove the rear axle cover, split pin and tighten the 3/4" castle nut.

3.3 TORQUE MOTOR MOUNTING NUTS:

Check torque 80-85 ft. lbs. (108.5-115 N.M.)

4 CONTROLS

4.1 CONTROL LEVERS, OPERATION & LINKAGE:

Check that the levers operate freely without binding.

4.2 FOOT PEDALS, OPERATION AND LINKAGE:

Check that pedals operate freely without binding.

4.3 ENGINE CONTROLS OPERATION AND LINKAGE:

Check that the engine controls operate freely without binding or slackening off due to vibration.

4.4 QUICK-TACH OPERATION AND LINKAGE:

Ensure the quick-tach linkage operates smoothly without binding and the attachment locks securely.

5 ELECTRICAL

5.1 CHARGE BATTERY:

A specific gravity reading of between 1.260 and 1.280 at an electrolyte temperature of 80°F (26°C) indicates the battery is fully charged.

5.2 BATTERY ELECTROLYTE LEVEL:

Check electrolyte level. If necessary add distilled water.

5.3 BATTERY TERMINALS:

Check battery terminals for corrosion. If necessary, clean.

5.4 OPERATION OF STARTER:

Engage and disengage the starter several times to ensure it's working properly. To prevent starter damage do not engage for more than 15 seconds. Allow 1 minute between starting attempts for cooling the starter.

5.5 OPERATION OF ELECTRICAL EQUIPMENT:

Make a complete check of all electrical equipment gauges and warning devices to ensure they are operating correctly.

6 GREASE/LUBRICATION

Lubricate the following points with a good quality grease. Numbers marked () indicates the number of fittings at each location.

- 6.1 Lift arm hinge points (2)
- 6.2 Lift cylinder bushings (4)
- 6.3 Tilt cylinder bushings (4)
- 6.4 Quick-tach hinge points (2)
- 6.5 Foot pedals (4)
- 6.6 Auxiliary foot pedal (1) (optional)
- 6.7 Universal joint (2)

7 GENERAL

7.1 TIRE PRESSURE:

Tires should be inflated evenly to the following pressures:

Tire Size	
5.90 x 15.....	50 PSI (345 KPa)
8.50 x 27 x 15	30-35 PSI (207-241 KPa)

*Floatation tires may be increased to 50 PSI (345 KPa) on hard flat surfaces.

7.2 WHEEL BOLT TORQUE:

Check and torque wheel bolt to 80-90 ft./lbs. (109-122 N.M.)

7.3 CONDITION OF CAB:

Inspect both seat and seat belt. Ensure all safety and instruction decals are in place. Inspect sound insulation, side windows and door operation for machines equipped with cab enclosure kits.

7.4 CONDITION OF SHIELDS:

Inspect and ensure all shields are in place and securely fastened. Replace missing or damaged shields before delivery.

7.5 CONDITION OF PAINTWORK:

Paint damage during shipping must be claimed against shipper.

7.6 GENERAL CONDITION:

Make a general inspection of the machine looking for loose or missing parts, oil leaks, etc.

7.7 CUSTOMER DELIVERY KIT:

Ensure that the customer delivery kit is complete. Each kit will contain:

- Parts Manual
- Owners and Operators Manual
- Engine Manual
- Service Booklet
- Safety Manual
- PDI/50 HR. Service Report
- Warranty Registration Card
- Ignition Key

6.2 PREVENTIVE MAINTENANCE SERVICE SCHEDULE

ITEM	SERVICE REQUIRED	8 HOURS	50 HOURS	150 HOURS	400 HOURS	1000 HOURS
ENGINE OIL	Check level and add if necessary. Use 10W30 API CLASSIFICATION SE/CC oil only. Use API service CD in diesel.					
HYDRAULIC OIL	Check level and add if necessary. Use 10W30 API CLASSIFICATION SE/CD oil only.					
RADIATOR	Check fluid level. If topping up is necessary use a solution containing 50% ethylene glycol and soft water.					
AIR CLEANER	Empty dust cup. Check condition indicator and service or replace element as required.					

ITEM	SERVICE REQUIRED	8 HOURS	50 HOURS	150 HOURS	400 HOURS	1000 HOURS
TIRES AND WHEELS	Check for low pressure or tire damage. Inflate standard tires 50 PSI (345 KPa) — Floatation tires 30-35 PSI (207-241 KPa). Check wheel bolt torque, 80-90 ft. lbs. (109-122 N.M.)					
LUBRI-CATION	Grease all fittings until excess shows.					
HYDRAULIC OIL FILTER	*Replace hydraulic oil filter element.					
ENGINE OIL	Replace engine oil. Use 10W30 API CLASSIFICATION SE/CD or any oil recommended by the engine manufacturer. For successive oil changes refer to Section 6.1.					
ENGINE OIL FILTER	Replace the engine oil filter. For successive oil filter changes refer to Section 6.1.					
50 HOUR SERVICE	Perform the complete 50 hour service check.					
SERVICE CHECK	As a preventive maintenance measure repeat the 50 hour service procedure every 150 hours as outlined in 6.1.					
ENGINE FUEL FILTER	Replace diesel engine fuel filters.					
HYDRAULIC OIL	Change the oil in the hydraulic system. Use 10W30 API CLASSIFICATION SE/CC oil only.					
FINAL DRIVE	Change the side transmission oil. Use 10W30 API CLASSIFICATION SE/CC oil.					
ENGINE COOLING SYSTEM	Drain, flush and refill.					

*Replace the hydraulic oil filter after the first 50 hours of operation, thereafter replace every 200 operating hours. If working in extremely dirty atmosphere replace every 100 hours.

NOTE: For complete engine service details and schedules refer to the engine manufacturers service manual.

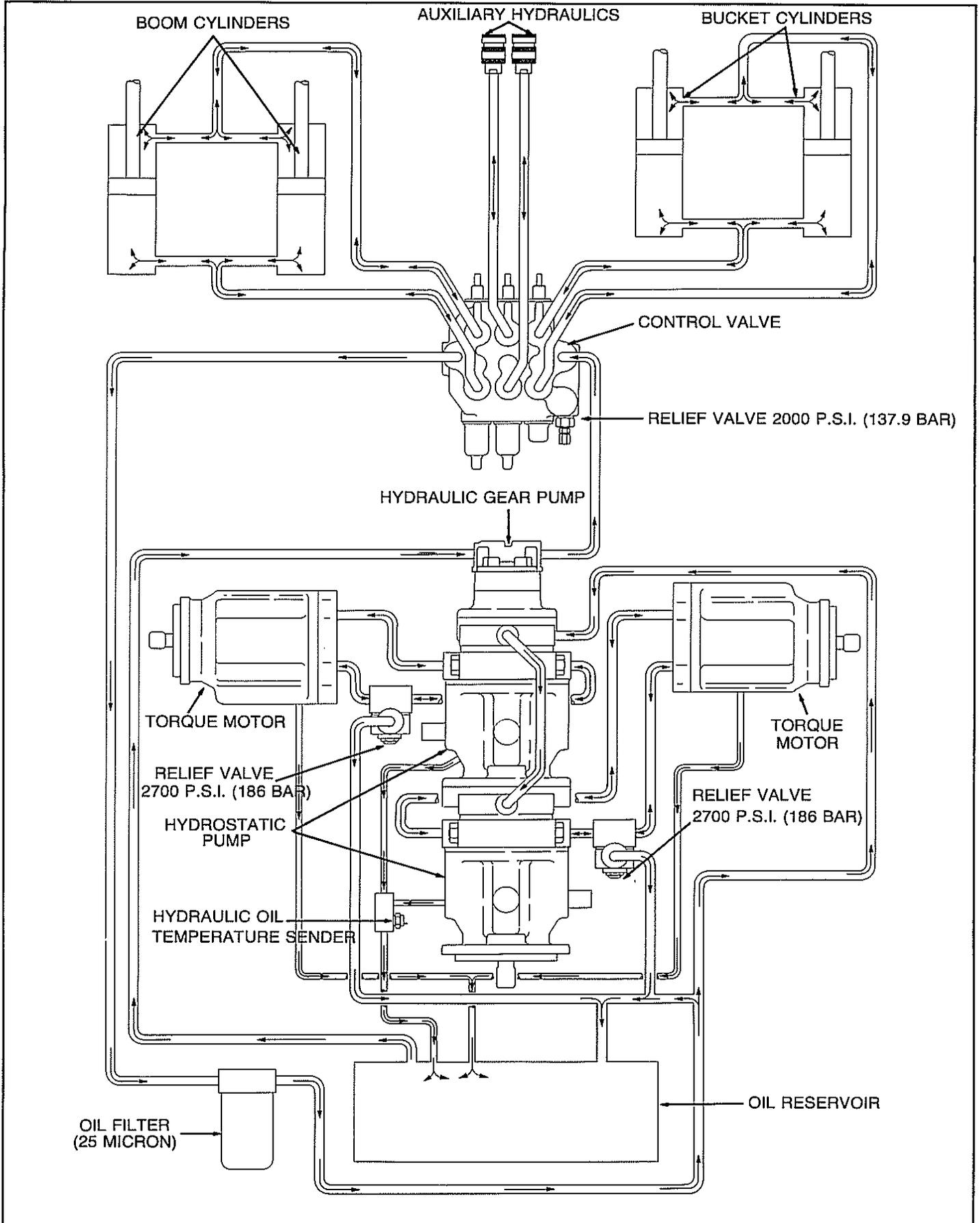
6.3 FUEL SELECTION

The following grades of fuel are recommended by the engine manufacturer.

Engine	Fuel	Capacity
*Wisconsin TJD	Regular Grade Gasoline	7.5 U.S. Gal. (28 l)
Kubota D850B	Diesel No. 2D only	7.5 U.S. Gal. (28 l)

on wisconsin engines equipped with catalytic purifiers use non leaded gasoline only.

6.4 HYDRAULIC/HYDROSTATIC CIRCUIT



6.5 HYDRAULIC SPECIFICATIONS:

PUMP:

TypeCessna, Gear Pump
 Rated pressure2000 P.S.I. (137.9 Bar)
 Rated speed.....2800 R.P.M.
 Rated flow at rated speed and
 pressure6.8 G.P.M. (25.8 l/m)

CONTROL VALVE:

Type.....3 spool monoblock, series type
 Relief valve setting2000 P.S.I. (137.9 Bar)
 Relief valve locationvalve inlet

HYDRAULIC FILTER:

TypeFram 25 micron
 Location.....side of L.H. fuel tank
 Element no.....8724 (FRAM NO. P1654)

OIL RESERVOIR:

Capacity12 U.S. Gal. (45 l)
 Oil type.....10W30 A.P.I. SERVICE SE, CD
 Filter cap15 micron air filter

6.6 TORQUE SPECIFICATIONS

Wheel Bolts (24).....80-90 ft. lbs. (109-122 N.M.)
 Torque Motor Mtg. Bolts (4).....80-85 ft. lbs. (109-115 N.M.)
 Hydrostatic Pump Mtg. Bolts (2)80-85 ft. lbs. (109-115 N.M.)

ENGINE MOUNTS — Engines mounted on rubber isolators are double nutted. The first nut should be torqued to 40-45 ft. lbs. (54-61 N.M.). The counter nut can then be torqued against the first nut 80-85 ft. lbs. (109-115 N.M.).

Idle Sprocket Nut (2)300 ft. lbs. (407 N.M.)
 Aux. Gear Pump (section bolts) ...25-28 ft. lbs. (34-38 N.M.)
 Hydrostatic Pump (section bolts) .17-20 ft. lbs. (23-27 N.M.)
 Torque Motor (section bolts)45-55 ft. lbs. (61-75 N.M.)
 Spark Plugs (Wisconsin)24-26 ft. lbs. (33-35 N.M.)

FOR NON-CRITICAL AND NOT OTHERWISE MENTIONED APPLICATIONS, THE FOLLOWING GENERAL ASSEMBLY TORQUES WILL APPLY:

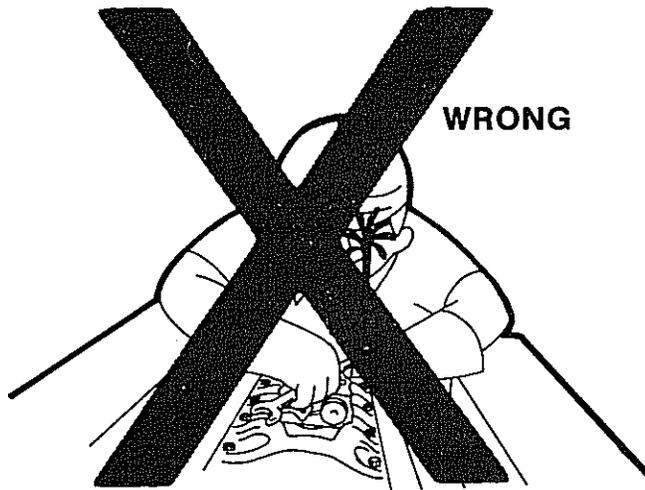
Bolts & Nuts	Torque Ft. lbs. (N.M.)
1/4-20	5- 7 (6.7- 9.5)
5/16-18	12- 15 (16- 20)
5/16-24	12- 15 (16- 20)
3/8-16	17- 22 (23- 30)
3/8-24	22- 27 (30- 37)
7/16-14	30- 35 (41- 47)
7/16-20	40- 45 (54- 61)
1/2-13	45- 50 (61- 68)
1/2-20	50- 60 (68- 81)
9/16-12	60- 70 (81- 95)
9/16-18	65- 75 (88-102)
5/8-11	75- 85 (102-115)
5/8-18	100-110 (136-139)

7 ENGINE SERVICE

- 7.1.1 SPECIFICATIONS — WISCONSIN TJD
- 7.1.2 LUBRICATION
- 7.1.3 DISTRIBUTOR TIMING
- 7.1.4 NEON LAMP TIMING
- 7.1.5 DISTRIBUTOR MAINTENANCE
- 7.1.6 SPARK PLUGS
- 7.2 SPECIFICATIONS — KUBOTA D850B

Prepare Yourself — Protect Your Eyes

Wear glasses or goggles to protect your eyes from spurting oil or solvents. Wear goggles when you grind or drill on metal parts.



ENGINE
SERVICE

7.1.1 SPECIFICATIONS — WISCONSIN TJD

No. of Cyl.	2
H.P.	18 @ 2800
Max. Torque	34 ft. lbs. @ 2000 (4.7 Kgm)
Displacement.....	53.9 cu. in. (883 c.c.)
Max. High Idle	2800
Engine Oil Capacity.....	3.5 Qts. (3.5 l)
Oil Type	10W30 API SERVICE SE, CC
Type of Fuel	Regular Grade Gasoline
Valve Clearance, Cold	Inlet .008" (.20 mm) Exhaust .016" (.41 mm)
Timing	20° before TDC @ 2000 RPM
Location of Timing Marks.....	Flywheel Vane
Spark Plug Gap.....	0.030 in. (.76 mm)
Point Gap	0.020 in. (.51 mm)
Cyl. Head Torque.....	22-24 ft. lbs. (30-33 N.M.)
Alternator	30 Amp.
Location of Fuse.....	Light Switch, Instrument Panel
Fuse Size	15 Amp.
Location of Fuse.....	Starter Circuit, Eng. Compartment
Fuse Size	30 Amp.
Air Filter Element.....	9027 (Wisc. No. LO188)
Spark Plug (4).....	Champion No. D-16J
Condensor, Point, Rotor Kit..	Wisconsin YQ23

7.1.2 LUBRICATION

Before starting a new engine, fill crankcase base with the correct grade of engine oil, as specified in "grade of oil chart". The capacity is 3 1/2 quarts, indicated by a *FULL* mark on *dip stick*. The combination oil dip stick and filler is mounted on the carburetor side of the engine, but can be located on the starting motor side upon request.

For *run-in* of new engines, use same oil as recommended in *Grade of Oil Chart*.

Use only high-grade highly refined oils, corresponding in body to the S. A. E. (Society of Automotive Engineers) Viscosity Numbers listed in *Grade of Oil Chart*. These will prove economical and assure long engine life.

SERVICE CLASSIFICATION OF OIL

In addition to the S.A.E. Viscosity grades, oils are also classified according to severity of engine service. Use oils classified by the American Petroleum Institute as *Service MS*, *SD* or *SE*. This type of oil is for engines performing under unfavorable or severe operating conditions such as: high speeds, constant starting and stopping, operating in extreme high or low temperatures and excessive idling.

Follow summer recommendations in winter if engine is housed in warm building.

Check oil level every 8 hours of operation.

The old oil should be drained and fresh oil added after every 50 hours of operation.

To drain oil; remove drain plug at either side of crankcase base. Oil should be drained while engine is hot, as it will then flow more freely.

GRADE OF OIL

SEASON OR TEMPERATURE	GRADE OF OIL
Spring, Summer or Fall + 120°F to + 40°F	SAE 30
Winter + 40°F to + 15°F + 15°F to 0°F Below Zero	SAE 20-20W SAE 10W SAE 5W-20
<i>Use oils classified as Service MS, SD or SE</i>	
Crankcase Capacity	3 1/2 Quarts

FIRING ORDER

In Model *TJD* the firing interval between *No. 1* cylinder and *No. 2* is 540°, — from *No. 2* to *No. 1*, 180°.

7.1.3 DISTRIBUTOR TIMING

Remove screen over the flywheel air intake opening. This will expose the timing marks on flywheel shroud, also the *vane* on flywheel, marked by an 'X' and the letters 'DC', See *Fig. 13*.

Next, remove the spark plug from No. 1 cylinder and turn engine over slowly, by means of the starting crank, and at the same time hold a finger over the spark plug hole to determine the compression stroke.

Upon reaching the compression stroke, continue turning the starting crank until the leading edge of the 'X' marked vane on flywheel is in line with the *vertical centerline mark* on the flywheel shroud, as shown in Fig. 13. The No. 1 piston is now on top dead center. Reassemble spark plug.

With the No. 1 piston now on TDC and on compression stroke, remove cap from distributor and mount as follows:

1. Align rotor with *center of notch* in distributor housing (location of No. 1 terminal tower). Mount unit in place so that the notch is in an approximate 10 o'clock position. See Fig. 16. This applies to either distributor mounting — to the end of generator frame or adapter housing on gear cover.
2. Tighten *advance arm mounting screw* securely in place.
3. Adjust breaker point gap to *.020 inch* opening, see 'Distributor Maintenance'.
4. With the *distributor clamp screw* loose, see Fig. 14, turn the distributor body slightly in a counter-clockwise direction until the breaker points are firmly closed. Then turn the distributor body in a clockwise direction until the *breaker points* are just beginning to open. At this point a slight resistance can be felt as the breaker point cam strikes the breaker point arm.

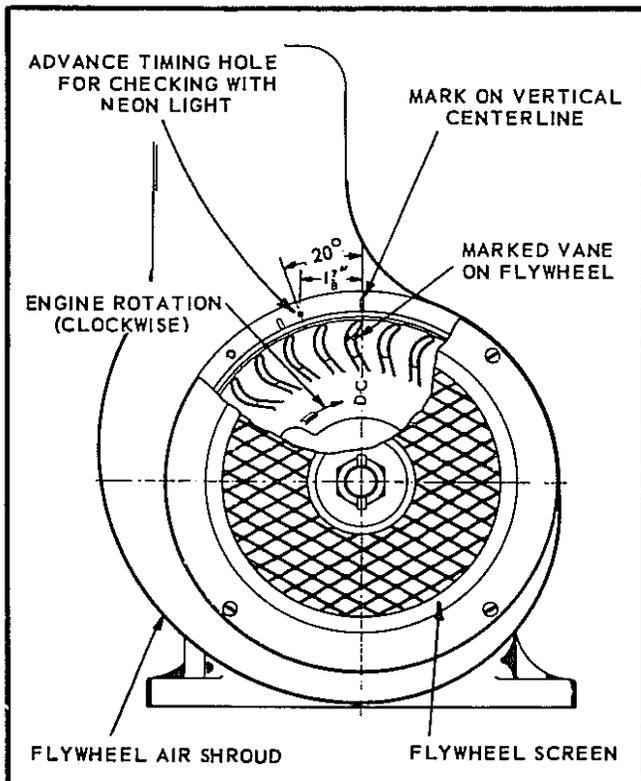


FIG. 13

5. Tighten *advance arm clamp screw*. No. 1 cylinder is now ready to fire in the retarded position.

The breaker point gap of *.020* of an inch should be checked and adjusted per paragraph (3), before distributor body is set and locked in place, as per paragraphs (4) and (5), because any change in gap opening will affect the ignition advance.

If care is exercised in the preceding instructions, the spark timing should be accurate enough for satisfactory starting, however, *checking spark advance* with a *neon lamp*, as described in 'Neon Lamp Timing' is necessary.

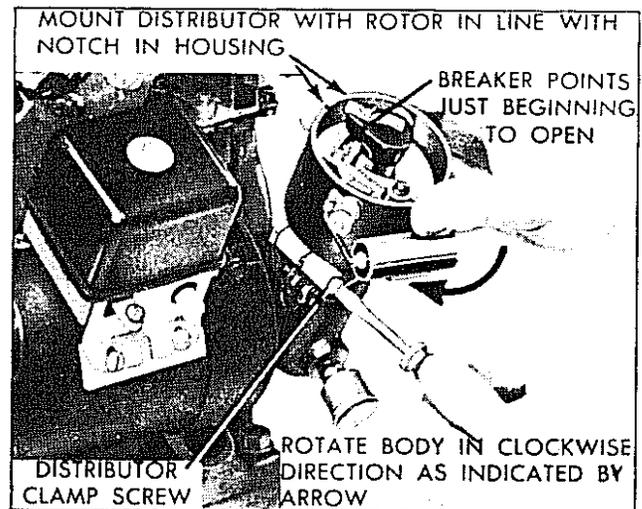


FIG. 14 DISTRIBUTOR TIMING

7.1.4 NEON LAMP TIMING (Fig. 15)

The engine should be timed to the 20° advanced position at not less than 2000 R.P.M. Check timing with a neon lamp as shown. Insert a small screw driver into the No. 1 terminal tower on the distributor cap, making contact with the spark plug wire terminal. Connect the red terminal clip, from a conventional type timing lamp, to the metal portion of the screw driver. One of the other two timing lamp wires is connected to the battery, and the other to ground.

Chalk or paint the end of the 'X' marked vane on the flywheel, white. Then, with the engine operating at 2000 R.P.M. or over, allow the flash from the neon lamp to illuminate the whitened vane. At the time of the flash, the leading edge of the vane should line up with the *running spark advance timing hole* on the flywheel shroud. If it does not, the distributor *clamp screw* should be loosened and the distributor body turned slightly clockwise or counter-clockwise, as required, until the *white flywheel vane* matches up with the *advance timing hole*. Be sure *clamp screw* is then carefully tightened.

If the engine is running below 2000 R.P.M. when timing, the automatic advance in the distributor will not be in the "full advance position" and thus the timing would not be accurate.

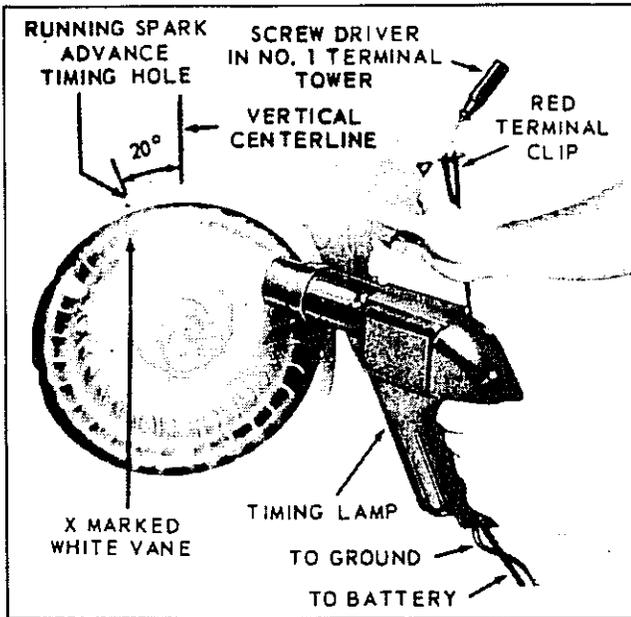


FIG. 15

7.1.5 DISTRIBUTOR AND GENERATOR MAINTENANCE

The breaker point gap should be .020 inch at full separation. To readjust point gap; turn engine over by means of the starting crank until the distributor breaker arm *rubbing block* is on a high point of the *cam*. Loosen the *stationary contact lock-nut*, and screw *fixed contact* in or out, until correct gap is obtained. Tighten locknut and recheck gap.

Every 50 hours of operating; the oiler in the generator commutator end head should have 3 to 5 drops of medium engine oil added.

The oiler on the side of the distributor base should have 3 to 5 drops of medium engine oil added, and the grease cup given one complete turn. Use a high melting point grease.

Every 100 hours, apply 3 to 5 drops of light engine oil (10W), to the felt in the top of the cam sleeve, and 1 or 2 drops to the breaker arm pivot.

Every 200 hours, add a small amount of high melting point grease to the breaker arm rubbing block.

Avoid excessive lubrication. Oil that may get on the contact points will cause them to burn.

7.1.6 SPARK PLUGS

Incorrect gap, fouled or worn spark plug electrodes, will have an adverse affect on engine operation. Remove spark plugs periodically, clean, regap or replace if necessary. Thread size is 18 mm.

Spark plug gap — 0.030 of an inch.

Replacement plugs must be of the correct heat range, like Champion No. D-16J, AC No. C86 commercial.

Use a new gasket when mounting either old or new plug and thoroughly clean threads in cylinder head before installation. Tighten spark plug 24 to 26 foot pounds torque. If torque wrench is not available, tighten plug until it begins to seat on the gasket, then turn 1/2 to 3/4 of a turn more.

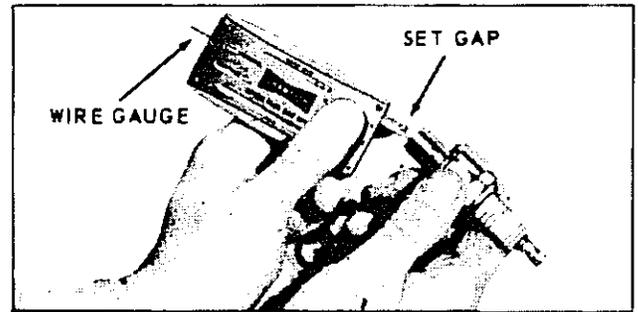


FIG. 16

7.2 SPECIFICATIONS — KUBOTA D850B

No. of Cyl.	3
H.P.	19.5 @ 2800
Max. Torque	39 ft. lbs. @ 1800 (5.39 Kgm)
Displacement.....	52 cu. in. (855 c.c.)
Max. High Idle	2800
Engine Oil Capacity.....	4.5 Qts. (4.5 l)
Oil Type.....	10W30 API SERVICE SE, CD
Oil Pressure.....	42.7-64 PSI @ 2800 (294.2-441.3 KPa)
Type of Fuel	Diesel No. 2D
Injector Working Pressure.....	1990-2133 PSI (13.7-14.7 MPa)
Cooling System Capacity.....	4.9 Qts. (4.6 l)
Radiator Pressure Cap	
Setting	12.8 PSI (88.3 KPa)
Compression	398-469 PSI (2746-3236 KPa)
Firing Order	1, 2, 3
Timing, Injection	25°-26° Before T.D.C.
Location of Timing Marks.....	Check Window, Flywheel Hsg.
Valve Clearance, Cold0057-.0073 in. (.145-.185 mm)
Cyl. Head Torque.....	43.4-47 ft. lbs. (58.8-63.7 N.M.)
Alternator.....	5 Amp. (25 Amp. Optional)
Location of Fuse.....	Light Switch, Instrument Panel
Fuse Size	15 Amp.
Location of Fuse.....	Starter Circuit, Eng. Compartment
Fuse Size	30 Amp.
Air Filter Element.....	6275 (Donaldson P10-1275)
Oil Filter Element.....	18717 (Kubota 15241-3209-2)
Fuel Filter Element.....	18685 (Kubota 15521- 4308-1)

8 TROUBLE SHOOTING

- 8.1 HYDROSTATIC DRIVE
- 8.2 HYDRAULIC SYSTEM
- 8.3 FINAL DRIVE TRANSMISSION
- 8.4 GASOLINE ENGINE
- 8.5 DIESEL ENGINE

Safe maintenance



Signs and Warning Tags

Replace all damaged or painted-over safety signs, warning plates and operating decals.

Use only tools, parts and fluids recommended by the manufacturer.

TROUBLE-
SHOOTING

8.1 HYDROSTATIC DRIVE		
Problem	Cause	Remedy
No power on one side (both directions)	Reservoir low on oil	Replenish with 10W30 API SE/CC oil. Check for hose or fitting leak.
	Disconnected control linkage	Reconnect and adjust linkage
	Groove pin sheared on pump pintle lever	Replace. Check pintle lever for loose bolt or excessive play.
	High pressure line failure	Replace line.
	Drive chain failure	Replace chain or connection link.
	Charge pump failure	Replace necessary parts. Power may appear to be lost on one side only initially but after a few moments running will be lost on both sides.
	Excessive internal leakage in pump and/or motor	Inspect and repair defective unit. Flush all lines and tank. Replace filter. Check on type of fluid used, and engine RPM.
No power on one side (one direction only)	Defective relief valve	Replace defective valve
	Damaged ball check	Disassemble and repair
No power on both sides (also loss of hydraulic power)	Reservoir low on fuel	Replenish with 10W30 API SE/CC oil. Check for hose or fitting leak.
	Universal joint failure between engine and pump	Inspect and replace damaged parts. Check for misalignment between engine and pumps.
	Drive coupling between front and rear pump failure	Inspect coupling for sheared splines — replace. Also check support bearings in pumps.
No power on both sides (full hydraulic power)	Reservoir low on oil	Replenish with 10W30 API SE/CC oil. Check for hose or fitting leak.
	Charge pump failure	Replace necessary parts.
	Charge pump relief valve failure	Pressure must be within 60-150 PSI (414-1034 KPa)
	Excessive internal leakage in pump and/or motor	Inspect and repair defective unit. Flush all lines and tank, change filter. Check on type of fluid used, and engine RPM.
	Damaged ball check	Disassemble and repair.

Problem	Cause	Remedy
Gradual loss of power as machine warms up	Excessive internal leakage in pump and/or motor	Inspect and repair defective unit. Flush all lines, tank and change filter. Check on type of fluid used, and engine RPM.
System erratic and/or noisy	Air in system due to low oil level in reservoir	Replenish with 10W30 API SE/CC oil.
	Air in system due to leak at suction fitting	Check fittings and tighten.
	Internal pump or motor wear caused by overspeeding	Inspect and repair defective unit. Flush all lines, tank and change filter. Check type of fluid used and engine RPM.
	Excessive play in linkage or pintle lever	Adjust linkage and tighten or replace pintle lever.
	Machine will not travel in a straight line in high range	Control levers binding
8.2 HYDRAULIC SYSTEM		
Loss of hydraulic power (no flow from gear pump)	Reservoir low on fluid	Replenish with 10W30 API SE/CC oil. Check for hose or fitting leak.
	Universal joint between engine and pump failure	Inspect and replace damaged parts. Check for misalignment between engine and pumps.
	Spline coupling failure between front and rear hydrostatic pump	Inspect coupling for sheared splines. Also check pump shaft bearings.
Loss of hydraulic power (flow from gear pump)	Hydraulic gear pump not functioning	Inspect and repair.
	Reservoir low on fluid	Replenish with 10W30 API SE/CC oil.
	Foot pedal linkage disconnected or binding	Inspect and adjust
Hydraulic action jerky	Auxiliary foot pedal engaged	Disengage.
	Relief valve failure in control valve	Check pressure and adjust
	Reservoir low on oil	Replenish with 10W30 API SE/CC oil.
Air in hydraulic system	Air in hydraulic system	Check for leak between reservoir and pump. Bleed system by extending and retracting lift cylinders several times.

Problem	Cause	Remedy
	Anti-cavitation check valve not functioning	Inspect and repair or replace.
Boom raises slowly at full engine RPM	Reservoir low on oil	Replenish with 10W30 API SE/CC oil.
	Foot pedal linkage binding	Inspect and adjust.
	Auxiliary foot pedal engaged	Disengage.
	Engine RPM too slow	Check RPM and reset. 2800 RPM.
	Check valve spring broken	Replace spring.
	Pressure relief valve in control valve faulty	Check pressure if necessary adjust.
	Internal leakage in pump due to wear	Check pump flow and repair or replace pump as necessary.
	Oil by passing one or both lift cylinder piston seals	Install new piston seal kits.
	Internal leakage in pump due to wear	Inspect spools and if necessary replace valve.
Lift or tilt cylinders will not support a load	External leak between or at control valve and cylinders	Check for leak and correct.
	Control valve spool not centering	Check for sticking. foot pedal linkage. Check for broken or stuck return spring on valve spool.
	Oil leaking by one or both cylinder piston seals	Install new piston seal kits.
Hydraulic oil overheating	Reservoir low on fluid	Replenish with 10W30 API SE/CC oil.
	Auxiliary foot pedal engaged	Disengage.
	Engine RPM too slow	Check RPM and adjust.
	Incorrect temperature sensor	Replace.
8.3 FINAL DRIVE TRANSMISSION		
Final drive transmission noisy	No lubricating oil	Check and bring oil to the proper level. Use 10W30 SE/CC engine oil.
	Axles have too much end play	Pre-load axle bearings removing all end play.
	Chain loose	Adjust chain tension or replace.

8.4 GASOLINE ENGINE		
Starting Motor will not crank engine	Weak or dead battery	Recharge battery. Check charging system.
	Poor ground connection	Check and repair.
	Faulty starting switch or relay	Check and repair.
	Defective starting motor	Test and repair or replace.
	Internal engine seizure	Turn engine manually to determine cause. Repair.
Engine cranks but does not start	No spark — Ammeter shows no discharge. (Indicates an open primary coil due to:)	Points not closing. Open primary wires. Defective ignition switch. Faulty coil.
	No spark — Normal ammeter reading (2-5 amps) — indicates primary circuit OK — trouble may be in secondary circuit due to:	Broken or grounded high tension wire from coil to distributor. Wet high tension wires. Faulty distributor cap or rotor. Broken secondary wiring of coil.
	Engine cranks but does not start	Shorted or grounded primary winding. Distributor points not opening. Grounded breaker point arm. Defective condenser.
	Weak spark	Loose ignition wiring. Burned or pitted distributor points. Wet spark plug wires. Defective condenser. Cracked distributor cap. Weak ignition coil.
	Good spark at each plug	Auxiliary foot pedal engaged. No fuel in tanks. Clogged filter or lines. Fuel line leak. Plugged vent in fuel cap.

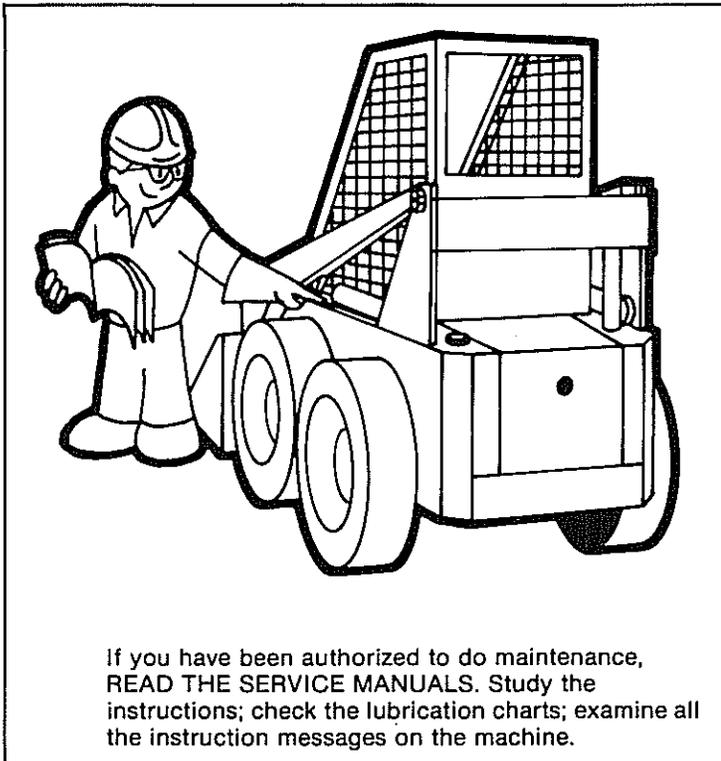
8.5 DIESEL ENGINE

FAULT FINDING CHART	
Fault	Possible Cause
Low cranking speed	1, 2, 3, 4.
Will not start	5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22, 31, 32, 33.
Difficult starting	5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 21, 22, 24, 29, 31, 32, 33.
Lack of power	8, 9, 10, 11, 12, 13, 14, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 31, 32, 33.
Misfiring	8, 9, 10, 12, 13, 14, 16, 18, 19, 20, 25, 26, 28, 29, 30, 32.
Excessive fuel consumption	11, 13, 14, 16, 18, 19, 20, 22, 23, 24, 25, 27, 28, 29, 31, 32, 33.
Black exhaust	11, 13, 14, 16, 18, 19, 20, 22, 24, 25, 27, 28, 29, 31, 32, 33.
Blue/white exhaust	4, 16, 18, 19, 20, 25, 27, 31, 33, 34, 35, 45, 56.
Low oil pressure	4, 36, 37, 38, 39, 40, 42, 43, 44, 58.
Knocking	9, 14, 16, 18, 19, 22, 26, 28, 29, 31, 33, 35, 36, 45, 46, 59.
Erratic running	7, 8, 9, 10, 11, 12, 13, 14, 16, 20, 21, 23, 26, 28, 29, 30, 33, 35, 45, 59.
Vibration	13, 14, 20, 23, 25, 26, 29, 30, 33, 45, 47, 48, 49.
High oil pressure	4, 38, 41.
Overheating	11, 13, 14, 16, 18, 19, 24, 25, 45, 50, 51, 52, 53, 54, 57.
Excessive crankcase pressure	25, 31, 33, 34, 45, 55.
Poor compression	11, 19, 25, 28, 29, 31, 32, 33, 34, 46, 59.
Starts and stops	10, 11, 12.

KEY TO FAULT FINDING CHART

- | | |
|--|---|
| 1. Battery capacity low | 31. Worn cylinder bores |
| 2. Bad electrical connections | 32. Pitted valves and seats |
| 3. Faulty starter motor | 33. Broken, worn or sticking piston ring(s) |
| 4. Incorrect grade of lubricating oil | 34. Worn valve stems and guides |
| 5. Low cranking speed | 35. Overfull air cleaner or use of incorrect grade of oil |
| 6. Fuel tank empty | 36. Worn or damaged bearings |
| 7. Faulty stop control operation | 37. Insufficient oil in sump |
| 8. Blocked fuel feed pipe | 38. Inaccurate gauge |
| 9. Faulty fuel lift pump | 39. Oil pump worn |
| 10. Choked fuel filter | 40. Pressure relief valve sticking open |
| 11. Restriction in air cleaner | 41. Pressure relief valve sticking closed |
| 12. Air in fuel system | 42. Broken relief valve spring |
| 13. Faulty fuel injection pump | 43. Faulty suction pipe |
| 14. Faulty atomisers or incorrect type | 44. Choked oil filter |
| 15. Incorrect use of cold start equipment | 45. Piston seizure/pick up |
| 16. Faulty cold starting equipment | 46. Incorrect piston height |
| 17. Broken fuel injection pump drive | 47. Damaged fan |
| 18. Incorrect fuel pump timing | 48. Faulty engine mounting (Housing) |
| 19. Incorrect valve timing | 49. Incorrectly aligned flywheel housing, or flywheel |
| 20. Poor compression | 50. Faulty thermostat |
| 21. Blocked fuel tank vent | 51. Restriction in water jacket |
| 22. Incorrect type or grade of fuel | 52. Loose fan belt |
| 23. Sticking throttle or restricted movement | 53. Choked radiator |
| 24. Exhaust pipe restriction | 54. Faulty water pump |
| 25. Cylinder head gasket leaking | 55. Choked breather pipe |
| 26. Overheating | 56. Damaged valve stem oil deflectors (if fitted) |
| 27. Cold running | 57. Coolant level too low |
| 28. Incorrect tappet adjustment | 58. Blocked sump strainer |
| 29. Sticking valves | 59. Broken valve spring |
| 30. Incorrect high pressure pipes | |

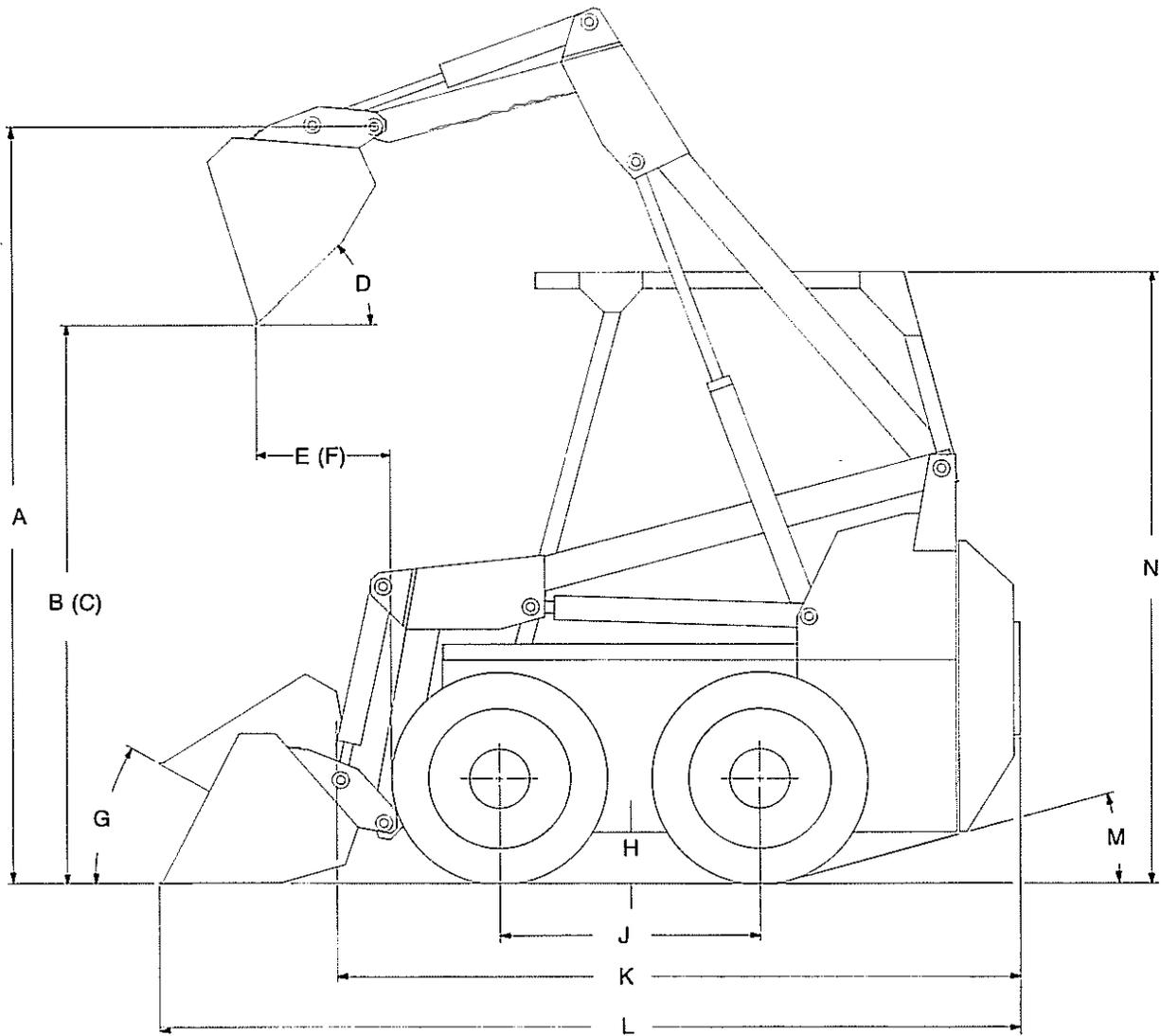
9 LOADER SPECIFICATIONS



If you have been authorized to do maintenance,
READ THE SERVICE MANUALS. Study the
instructions; check the lubrication charts; examine all
the instruction messages on the machine.

SPECIFICATIONS

9 SPECIFICATIONS



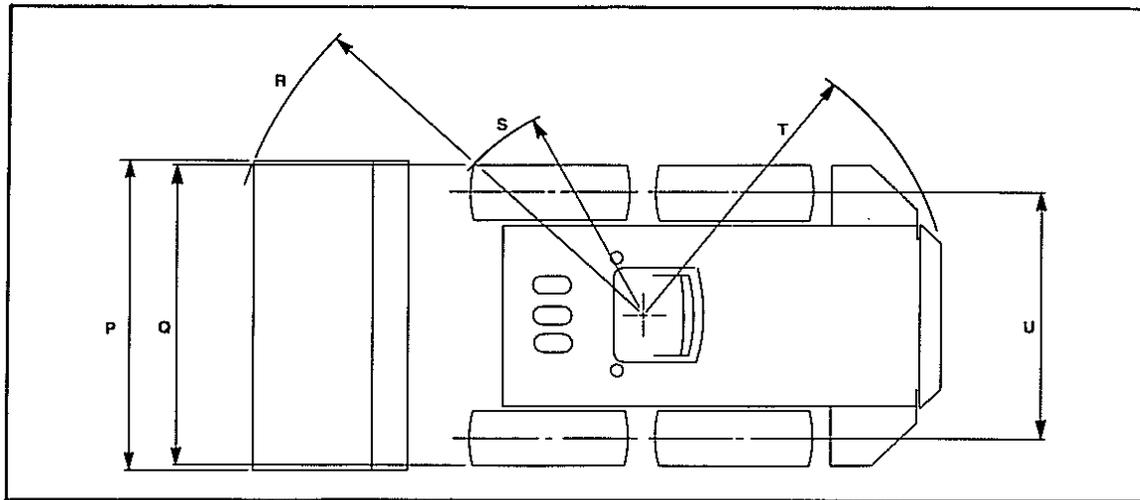
SPECIFICATIONS — MODEL 81

A. Height to Hinge Pin	94.25" (2394 mm)
B. Dump Height.....	70" (1778 mm)
C. Height at 45° Dump	67.75" (1721 mm)
D. Dump Angle	44°
E. Reach at Maximum Height.....	16.25" (413 mm)
F. Reach at Specified Height (c)	17.75" (451 mm)
G. Maximum Roll Back	28°
H. Ground Clearance	6" (152 mm)
J. Wheel Base	33.5" (851 mm)
K. Overall Length Less Bucket	80" (2032 mm)
L. Overall Length With Bucket.....	102" (2591 mm)
M. Angle of Departure.....	23°
N. Overall Height with ROPS.....	76.5" (1943 mm)
O. Bucket Width.....	35.75" (908 mm)
P. Clearance Width Less Bucket	35.5" (902 mm)
Q. Clearance Circle Front—With Bucket.....	63" (1600 mm)
R. Clearance Circle Front — Less Bucket.....	35" (889 mm)
S. Clearance Circle Rear	43.5" (1105 mm)
T. Tread.....	29" (737 mm)

SPECIFICATIONS — MODEL 83

A. Height to Hinge Pin	94.25" (2394 mm)
B. Dump Height.....	70" (1778 mm)
C. Height at 45° Dump	67.75" (1721 mm)
D. Dump Angle	44°
E. Reach at Maximum Height.....	16.25" (413 mm)
F. Reach at Specified Height (c)	17.75" (451 mm)
G. Maximum Roll Back	28°
H. Ground Clearance	6" (152 mm)
J. Wheel Base	33.5" (851 mm)
K. Overall Length Less Bucket	84.25" (2140 mm)
L. Overall Length With Bucket.....	106.25" (2699 mm)
M. Angle of Departure.....	23°
N. Overall Height with ROPS.....	76.5" (1943 mm)
O. Bucket Width.....	35.75" (908 mm)
P. Clearance Width Less Bucket	35.5" (902 mm)
Q. Clearance Circle Front—With Bucket.....	63" (1600 mm)
R. Clearance Circle Front — Less Bucket.....	35" (889 mm)
S. Clearance Circle Rear	46" (1168 mm)
T. Tread.....	29" (737 mm)

SPECIFICATIONS AND DESIGN ARE SUBJECT TO CHANGE WITHOUT NOTICE.



OPERATIONAL:

Operating Load.....800 lbs. (363 Kg)
 Tip Capacity1600 lbs. (726 Kg)
 Shipping Weight Model 812640 lbs. (1197 Kg)
 Model 832760 lbs. (1252 Kg)
 Operating Weight Model 812970 lbs. (1347 Kg)
 Model 833090 lbs. (1402 Kg)
 Travel Speed0-4.8 mph (0-7.7 km/hr.)

CONTROLS:

VEHICLE: Steering, direction and speed controlled by two hand operated control levers.

HYDRAULICS: Boom lift, bucket tilt and auxiliary functions (opt.) controlled by separate foot pedals.

ENGINE: Hand lever throttle, engine stop and key type ignition starter switch.

ENGINES:

	MODEL 81	MODEL 83
Make and Model	Wisc. TJD	Kubota D850B
Fuel	Gasoline	Diesel No. 2D
H.P.	18	19.5
No. of Cylinders	2	3

Displacement	53.9 in. ³ (883 c.c.)	52 in. ³ (855 c.c.)
Cooling	Air	Water

HYDRAULICS:

Pump Output6.8 GPM (25.8 l/m)
 System Relief Pressure.....2000 PSI (137.9 bar)
 Control Valve.....Series type with float on boom section and detent on auxiliary
 Filter.....25 micron

ELECTRICAL:

Alternator Model 81 . . . 30 amp. Flywheel Alternator
 Model 83 . . . 10 amp.
 Model 83 (opt.) . . . 25 amp.
 Battery.....85 amp.
 Starter12 volt

CAPACITIES:

Fuel Tank8.5 U.S. Gal. (32 l)
 Hydraulic Reservoir.....18 U.S. Gal. (68 l)
 Side Transmissions.....2.5 U.S. Gal (9 l)
 Engine Model 813.5 Qts. (3.5 l)
 Model 83.....4.5 Qts. (4.5 l)

SAFETY **RULES**

1. You must be trained and qualified in the operation of this vehicle.
2. Read the owners and operators manual before starting vehicle.
3. Fasten seat belt before starting loader.
4. Be sure control levers are in neutral and the parking brake engaged before starting or disembarking loader.
5. Keep load low — do not travel or turn with lift arms up.
6. Do not leave loader with engine running, lift arms up or parking brake disengaged.
7. Do not exceed the rated load capacity.
8. Back up all inclines, such as curbs, embankments, ramps, etc.
9. Keep all protective shields in place.
10. Before breaking any hydraulic circuit lower all hydraulic cylinders before the system pressure is relieved.
11. When servicing the machine with arms up engage the boom lock.

SAFETY EQUIPMENT

The Thomas S/S loader is equipped with several items for your protection. They are:

1. Seat belt
2. Roll over protective structure (ROPS) with screen
3. Safety treads for steps
4. Protective shields
5. Parking brake

These items are provided for your safety. Take care of them, and inspect their condition often.

1. Check seat belts for frayed or cut webbing, damaged buckles or loose mounting brackets.
2. Check ROPS for damage or loose mounting. Never remove the protective screens.
3. Keep safety treads clean. Replace them if they become worn or come off.
4. Keep all protective shields in place.