Timberjack 360/460 Skidder

Operator Manual
Timberjack 360/460
Skidder
S/N: 10EB1402 & up

CALIFORNIA
Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

If this product contains a gasoline engine:

⚠ WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

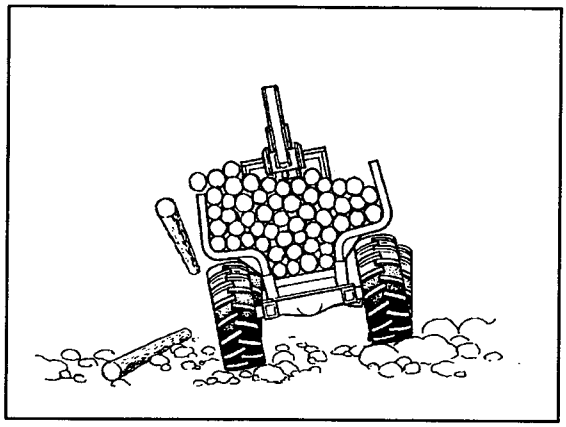
The State of California requires the above two warnings.

Worldwide Construction
And Forestry Division
LITHO IN U.S.A.

Section 10 - Specifications

Section 11 - Miscellaneous

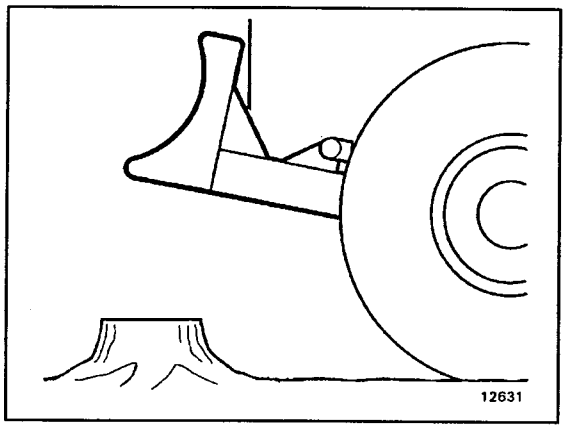
3.5 Operating Safety Precautions



Do not overload the woodbunk on a forwarder. A load that is stacked too high can cause the machine to overturn, or part of the load to roll off when traveling over rough terrain.

Check yard and landing areas as well as skidding trails for hazards: look for stumps, large rocks, holes, and drop-off areas; be aware of springs, mud holes, creeks and standing water and plan your operation in accordance with the environment you are working in.

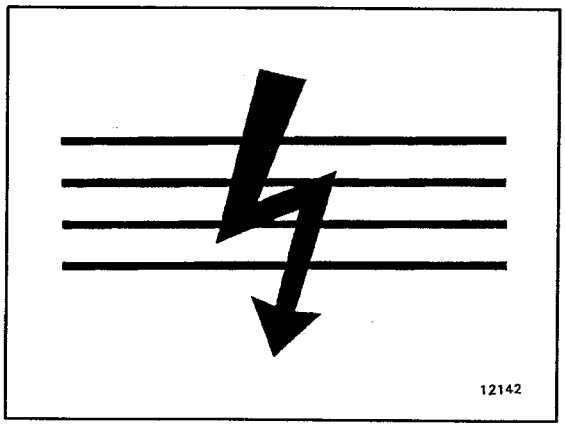
Never use the parking brake to slow down or stop the vehicle except in an emergency. Ensure that the brake is properly adjusted at all times.



When working on steep slopes, travel as straight up and down as possible to prevent roll-over.

Before moving the machine, raise the dozer blade and, when traveling, keep the blade high enough off the ground to clear stumps.

Approach with caution areas where overhanging telephone or electric power lines are present. Serious injury or death by electrocution can result if the machine or any of its attachments are not kept a safe distance from high-voltage electric power lines.



Maintain a distance of 10 ft. (3 m) between the machine or boom and any power line carrying up to 50,000 Volts or less.

Power lines carrying more than 50,000 Volts require a safety distance of 10 ft. (3 m) plus 1/2 inch (13 mm) for each additional 1,000 Volts above the 50,000 Volt level.

If state/province, local or job site regulations require even greater safety distances than stated above, adhere strictly to these regulations for your own protection.

3.7 Driving/Transporting on Public Roads

When traveling on public roads, use accessory lights and other cautionary devices to bring your approach to the attention of other vehicle operators. Ensure that your vehicle meets all regulatory requirements.

If the machine must be transported, make sure it is adequately secured to the transporting vehicle. Even though the brakes may be fully engaged, the wheels must be blocked and the machine secured with chains, wire, or rope to prevent movement during transport.

Position and secure the implement attachment, including the loader, so that the equipment will not move and cause imbalance during transport.

When transporting the machine ensure that the overall height does not exceed local or state maximum height regulation.

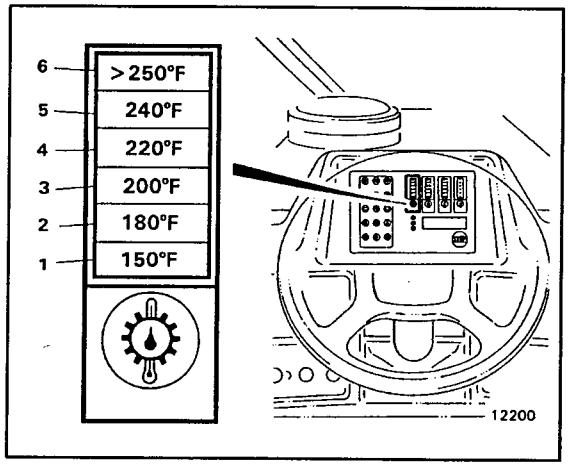
4.3 Controls and Instrumentation

4.3.1 Operator Controls and Instruments

1. Air Circulating Fan
2. Sun Visor
3. Radio/Tape Player
4. Steering Wheel
5. Instrument Panel
6. Upper Switch Panel
7. Upper Fuse Panel Cover
8. Parking Brake Switch
9. Rear View Mirror
10. Ignition Switch.
11. Air Vents.
12. Air Conditioner Switch Control Panel
13. Transmission Controller.
14. Joystick Grapple Control
15. Grapple Constant Pressure Indicator
16. Rear Axle Differential Lock Switch
17. Decking Blade Control Lever
18. Transmission Declutch Switch
19. Winch Control Lever
20. EGS Override Switch
21. Interlock Relay Circuit
22. Air Intake heater Button.
23. Master Electrical Disconnect.
24. Accelerator Pedal
25. Service Brake Pedal
26. Foot Rest
27. Operator's Seat
28. Fire Extinguisher
29. Lower Fuse Panel Compartment
30. Horn Button
31. Twelve Volt Power Outlet
32. Test and Display Selection Button
33. Instrument Panel
34. Winch Position Rear View Mirror (Not Shown)

4.3 Controls and Instrumentation

4.3.4 Monitor Instrument Panel

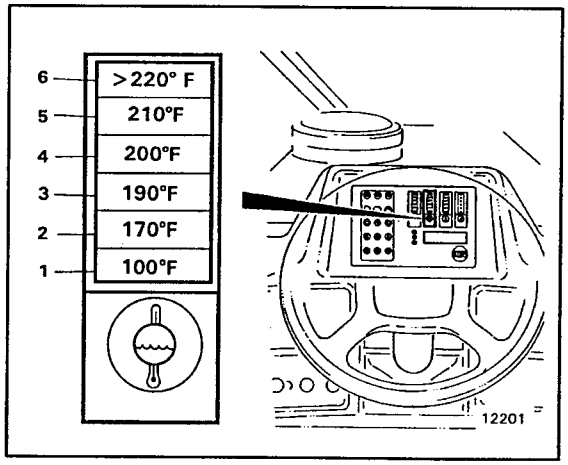


Transmission Oil Temperature Bar Graph

If the oil temperature is less than 66°C (150°F), the first segment of the bar graph (1) and the symbol below it will flash off and on until the oil warms up to that temperature. As the oil temperature increases, each additional segment of the bar graph (2,3,4) will light up.

When the amber bar is indicated (5), it will flash off and on.

When the red bar is indicated (6), both the red bar and the red 'STOP' sign will begin to flash off and on, and the warning buzzer will sound.



Engine Coolant Temperature Bar Graph

If the coolant temperature is less than 38°C (100°F), the first segment of the bar graph (1) and the symbol below it will flash off and on until the coolant warms up to that temperature. As the coolant temperature increases, each additional segment of the bar graph (2,3,4) will light up.

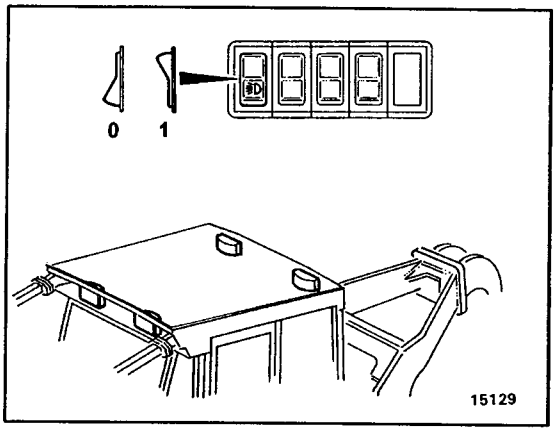
When the amber bar is indicated (5), it will flash off and on.

When the red bar is indicated (6), both the red bar and the red 'STOP' sign will begin to flash off and on, and the warning buzzer will sound.

4.3 Controls and Instrumentation

4.3.5 Switches and Indicators

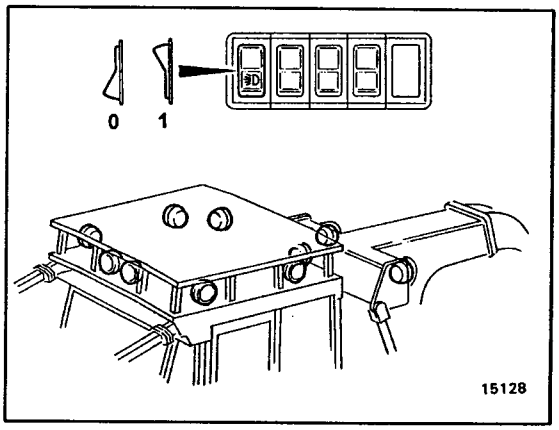
Note:
Road Light and Work Light packages are not available on the same machine.



Road Lights

The left hand toggle switch (1) operates the road lights.

0 = Off
1 = On

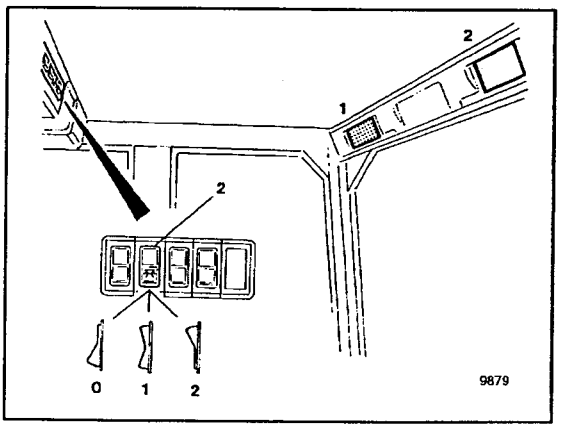


Work Lights

The left hand toggle switch (1) operates the work lights.

0 = Off
1 = On

Important!
Do not use the lights for an extended period of time unless the engine is running.



Interior Lights

The rocker switch (2) operates the interior lights.

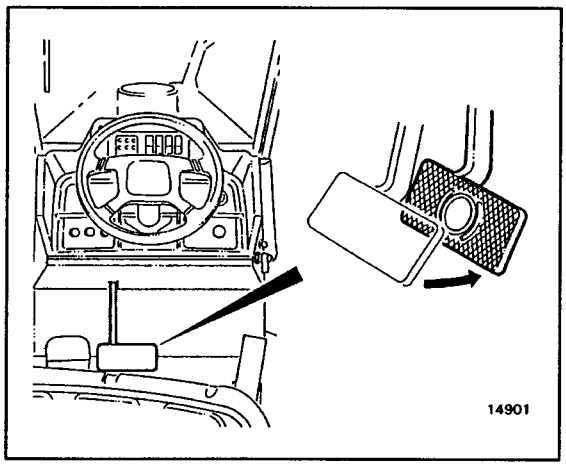
0 - Off

1 - Night Interior light (red) Used at night to reduce glare and also to make the operator visible when giving hand signals to other workers.

2 - Interior light (White).
Used for reading only.

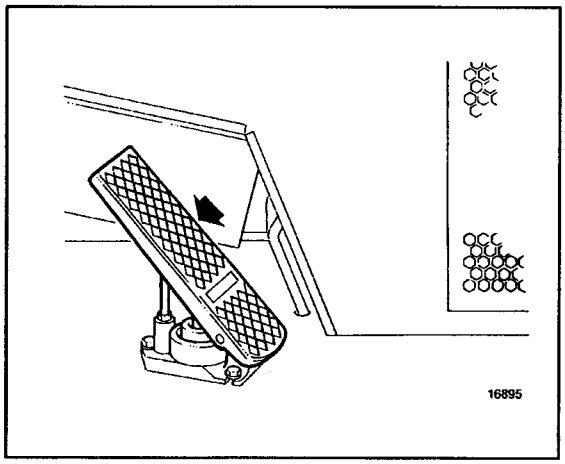
4.3 Controls and Instrumentation

4.3.6 Driving/Operating Controls



Service Brake

The service brake is used for normal stopping or slowing down, and can be applied with either the left or right foot.



Accelerator Pedal

The accelerator is used to control engine rpm.

Pressing down on the accelerator will increase engine rpm.

Lifting your foot off the accelerator will decrease engine rpm.

5.1 Driving the Skidder

5.1.1 Pre-Start Checks

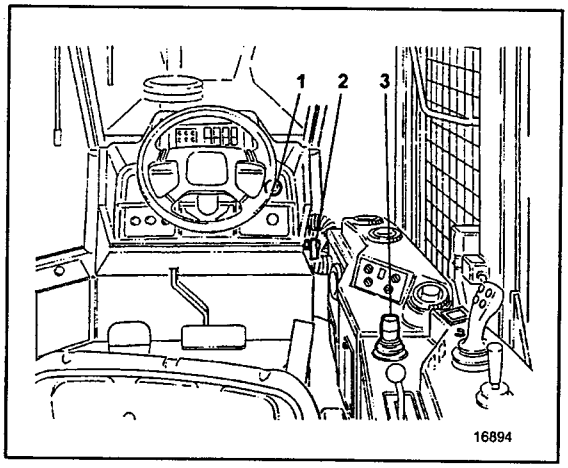
Before starting the engine, walk around the machine and check for damage, loose hardware, hydraulic oil leaks and worn components.

Unlock both entry door latches, engine side screen panels and the fire suppression door latch.

Perform 8-hour maintenance schedule as detailed in Section 6.

Important!
THE SKIDDER IS EQUIPPED WITH AN INTERLOCK CIRCUIT WHICH:

1. *Requires that a specific starting procedure be followed (see section 5.1.4).*
2. *Shifts the transmission into neutral within five seconds of sensing the operator is not sitting in the seat.*



5.1.2 Before Starting The Engine

WARNING

Do not start the engine or attempt to operate the machine unless seated in the operator's seat with the seat belt fastened, and in full control of all equipment functions.
Failure to follow these safety precautions can lead to risk of personal injury or equipment damage.

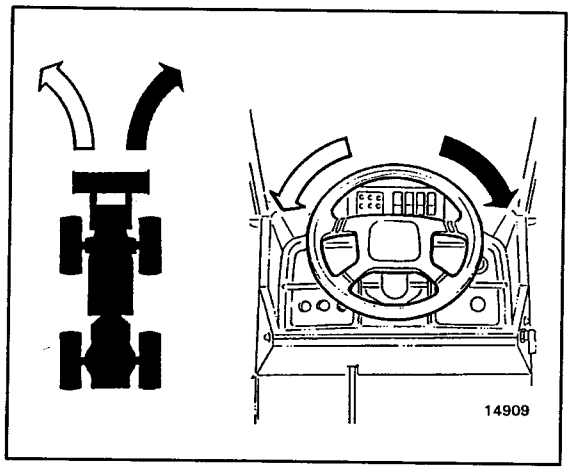
Before starting the engine, ensure that the operating controls are positioned:

1. Parking Brake is ON.
2. Master Electrical Disconnect Switch is ON.
3. Transmission Controller is in NEUTRAL.

Decking blade and grapple are resting on the ground.

5.1 Driving the Skidder

5.1.7 Operating the Driving Controls



Steering the Skidder

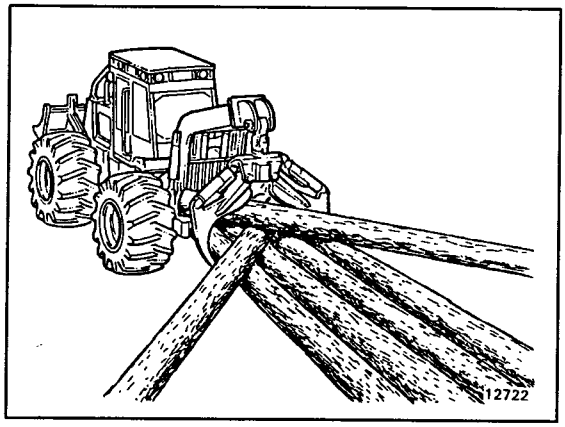
Steering is controlled by the steering wheel. The engine must be running to operate the hydraulic steering system, unless the skidder is equipped with a secondary steering system (optional equipment).

Turn the wheel in the direction that you want the machine to turn. The faster the wheel is turned, the faster the turning speed.

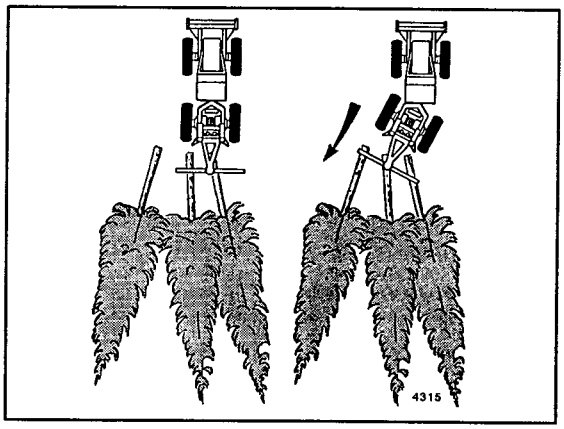
Once the turn is completed, turn the steering wheel in the opposite direction to straighten the machine.

5.3 Skidding Technique

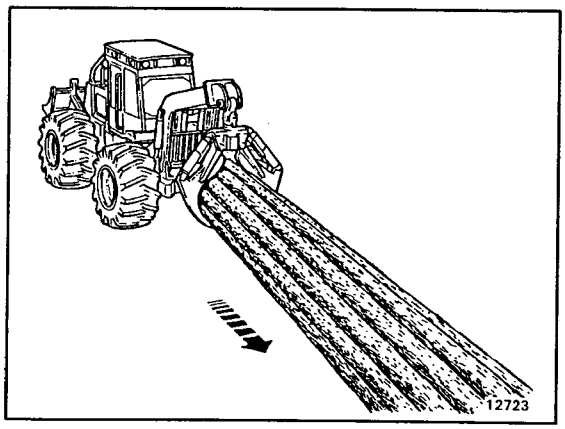
5.3.2 Grapple Skidding



4. To add more logs, place them on top of the load in an 'X' pattern. Locate the grapple over the 'X' to pick up the combined load.



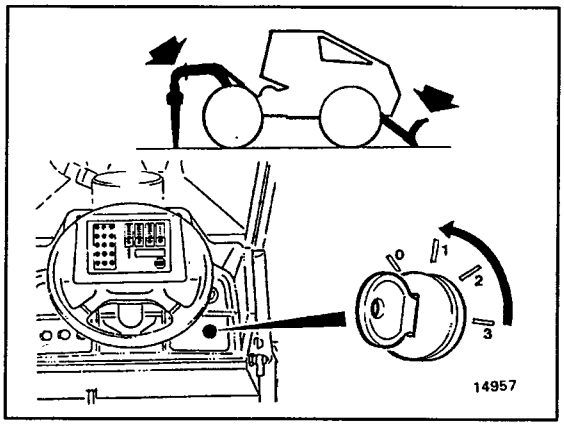
5. Articulating the skidder will increase the pick-up range of the grapple.



6. When backing up with a load, make sure the load is lined up with the skidder. Use the butt pan to push the logs.

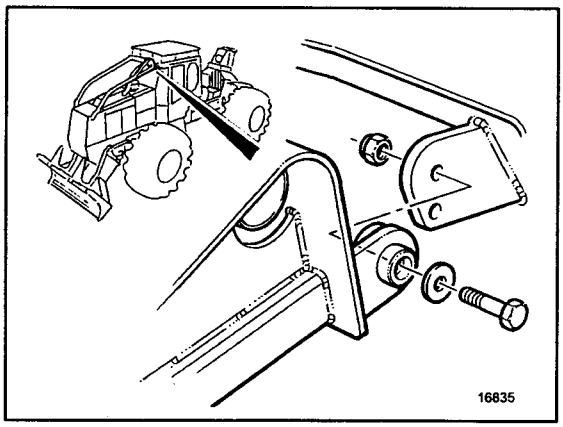
5.7 Tilting the Cab

5.7.1 Raising the Cab

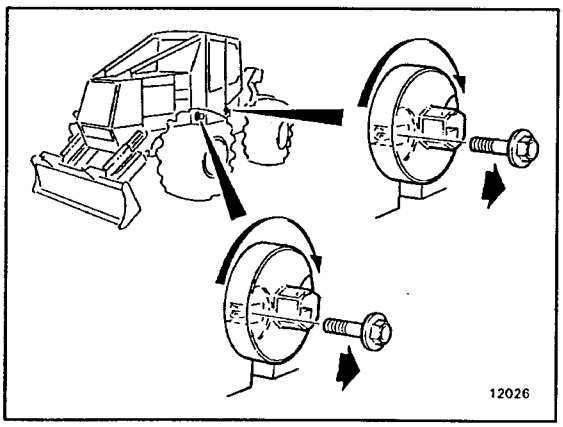


WARNING

Tilt the cab only when the skidder is on level ground and the front and rear frames are aligned. Lower the decking blade and grapple to the ground. Apply the parking brake, and turn off the ignition switch. Failure to follow these safety precautions may lead to risk of personal injury or machine damage.



1. Remove the canopy sweep bolts.

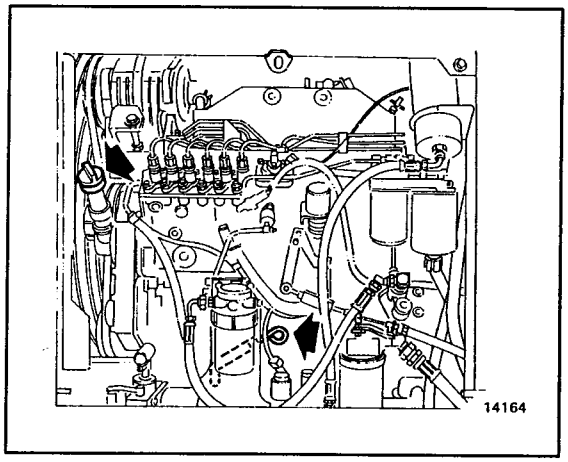


2. Remove the locking pin bolts (18 mm wrench), and turn each locking pin clockwise using a 24 mm socket wrench. The yellow orientation line on the pin should be in a vertical position.

   If it is necessary to leave the left hand door open, install the door stop (Section 4) before tilting the cab.

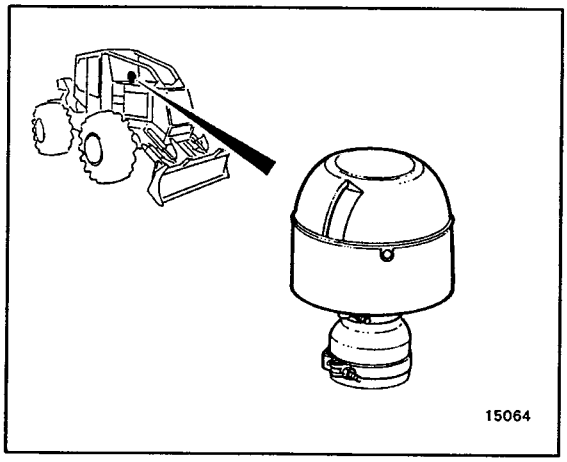
6.2 Maintenance Procedures

6.2.1 Maintenance 8 Hours



1. Check Engine Oil Level

Check the oil level with the dipstick. Add oil if required through the filler tube. See Sections 6.3 and 6.4 for recommended oil and viscosity grades.



2. Check Engine Air Filter Pre-Cleaner

WARNING

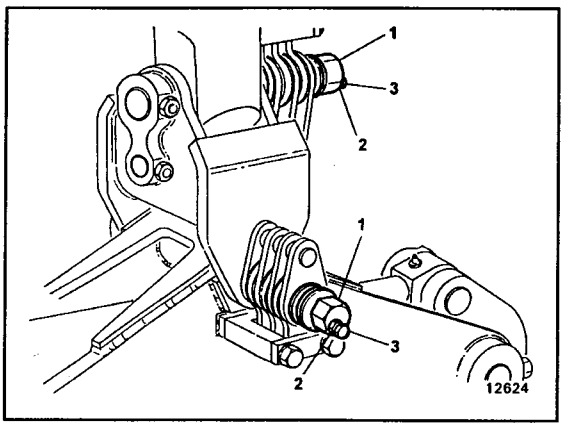
Do not install or remove the pre–cleaner while the engine is running. Keep fingers, eyes, and other objects away from the discharge slot.

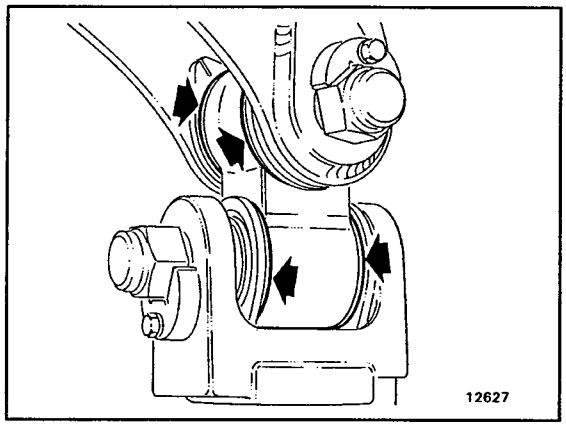
The rotor must be stopped before removing the pre–cleaner.

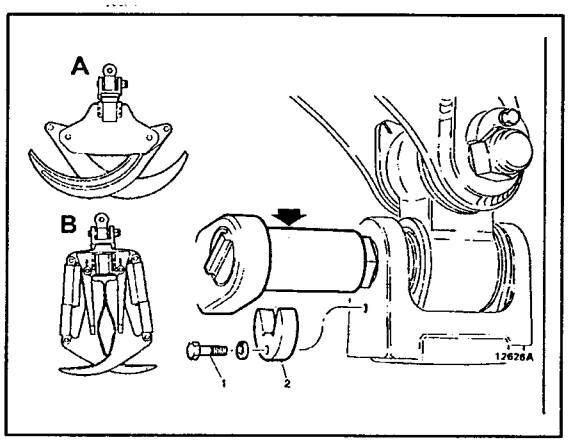
Check that the pre-cleaner is tightly clamped to the air cleaner and that the discharge slot is facing away from the cab.

6.2 Maintenance Procedures

6.2.1 Maintenance 8 Hours







15. Check Snubber Adjustment - Timberjack Grapple

1. Loosen the jam nut (2).
2. Back off the lock screw (3)
3. Tighten the snubber nut (1) to 160 Nm (120 lb ft.) or until the desired dampening is achieved.
4. Torque the lock screw (3) to 122 Nm (90 lb ft.), then tighten the jam nut against the snubber nut.

Important!
Over tightening the snubber nuts (1) will cause premature friction disc wear.

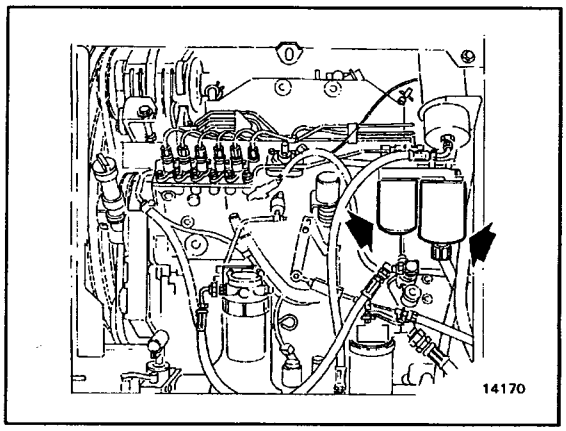
Check Snubber Adjustment - Esco Grapple

1. Check the friction disc thickness. If they are 1/8" (3 mm) or less in thickness, they must be replaced.
2. Remove the nut lock (1) and lock plate (2). Check the acorn nut torque:
   Bunching Heads 'A' must be 625 Nm. (460 lb.ft.).
   Sorting Heads 'B' must be 500 Nm. (370 lb.ft.).
3. Install the nut lock plate and bolt. Torque the lock bolt (1) to 237 - 270 Nm (172 - 200 lb.ft.).

Important!
Over tightening the snubber nuts will cause premature friction disc wear.

6.2 Maintenance Procedures

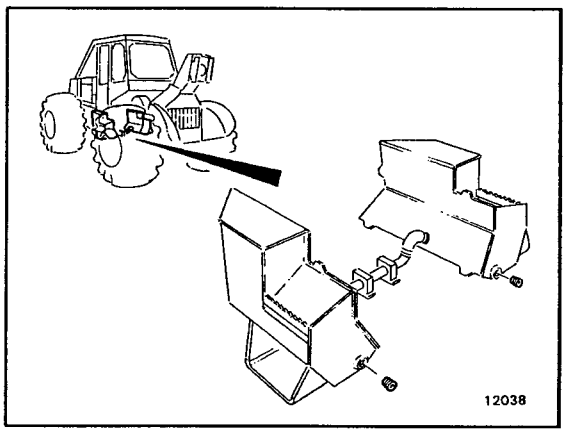
6.2.2 Maintenance 250 Hours



35. Change Fuel Filters.

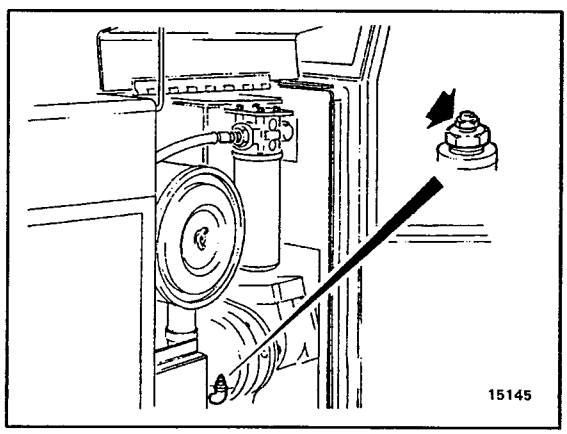
Change the fuel filter and strainer.
Fill each replacement filter with clean fuel before installation.

See Item 4 for bleeding instructions after changing the filters.



36. Drain Water From the Fuel Tank.

Drain approximately one pint (1/2 liter) of fuel from each tank to remove any water or sediment.



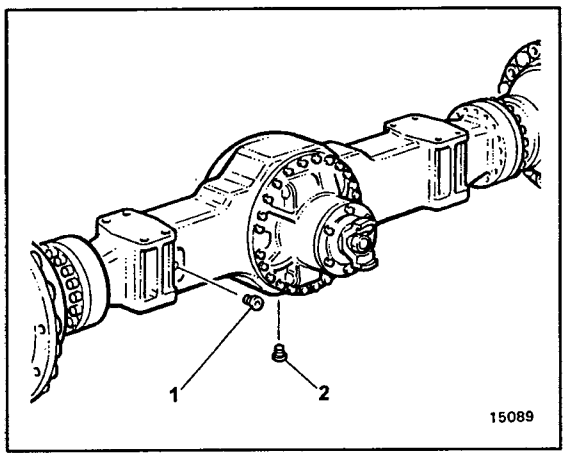
37. Clean Transmission Breather.

Remove and clean the transmission breather and surrounding area.

A clogged breather can cause pressure build-up inside the transmission, resulting in oil leakage around the seals.

6.2 Maintenance Procedures

6.2.5 Maintenance 1000 Hours



52. Change Axle Differential Oil.

WARNING

The skidder must be parked on level ground, with the engine shut off, and the parking brake on. Lower the decking blade and grapple to the ground before working under the skidder.
Failure to follow these safety precautions can lead to risk of personal injury.

Remove the drain plug (2) and drain the oil from the differential into a suitable container.

After all of the oil has been drained, replace the plug.

Remove the oil level plug (1) and add fresh oil until it is level with the bottom hole. Install the oil level plug.

See Section 6.3 for recommended oil.

6.3 Fluids and Lubricants

6.3.6 Recommended Hydraulic System Fluids

ISO Viscosity Grade	Supplier	Brand Name	Ambient Operating Range Minimum	Maximum
15	Esso	Univis N15	-34°C (-29°F)	29°C (84°F)
	Petro-Canada	Harmony Arctic 15		
	Gulf	Harmony Arctic 15		
	Mobil	DTE 11M		
	Shell	Tellus T15		
	Texaco	Rando Superflo 15		
	Texaco	Rando HDZ 15		
	Total	Equivis ZS 15		
22	Esso	Univis N22	-26°C (-15°F)	43°C(109°F)
	Petro-Canada	Harmony HVI 22		
	Gulf	Harmony HVI 22		
	Petro-Canada	Harmony Plus		
	Shell	Tellus T22		
	Texaco	Rando Superflo 22		
	Texaco	Rando HDZ 22		
32	Amsoil	Synthetic Hydraulic Fluid	-18°C (0°F)	46°C (115°F)
	Blount	Premium A.S. 32		
	* Esso	Univis N32		
	Petro-Canada	Harmony HVI 36		
	Gulf	Harmony HVI 36		
	Mobil	DTE 13M		
	Shell	Tellus T32 or Tellus 32		
	Texaco	Rando Superflo AZ		
	Texaco	Rando HDZ 32		
	Total	Equivis ZS 32		
46	Arco	Duro AW46	-7°C (19°F)	46°C (115°F)
	Blount	Premium A.S. 46		
	Chevron	HYD AW46		
	Petro-Canada	Harmony AW46		
	Gulf	Harmony AW46		
	Mobil	DTE 15M		
	Shell	Tellus 46		
	Texaco	Rando HDZ 46		
	Total	Equivis ZS 46		
68	Esso	Univis N68	-2°C (28°F)	46°C (115°F)
	Total	Azolla ZS 68		
	Texaco	Rando HDZ 46		
	Blount	Premium Tractor Hyd. Fluid		
	Blount	Premium A.S. 68		

* Factory Fill

7. Schematics

7.4 460 Dual Arch Grapple

1. Hydraulic Valve - Steering
2. Crossover Relief ..... 24.48 MPa (3550 psi)
3. Steering Cylinders
4. Decking Blade Cylinders
5. Grapple Arch Cylinders
6. Grapple Boom Cylinders
7. Grapple Rotate Motor (Esco Head) ..... 260 cc/rev (15.9 in3/rev)
   7a Grapple Rotate Motor (Timberjack Head) .. 491 cc/rev (30.0 in3/rev)
8. Crossover Relief (Esco Head) ..... 17.2 MPa (2500 psi)
   8a Crossover Relief (Timberjack Head) ..... 20.7 MPa (3000 psi)
9. Grapple Tong Cylinders
10. Valve Section - Grapple Tongs
11. Port Relief - Grapple Tongs 4a ..... 22.2 MPa (3225 psi)
12. Port Relief - Grapple Tongs 4b ..... 24.1 MPa (3500 psi)
13. Valve Section - Grapple Rotator
14. Valve Section - Grapple Boom
15. Port Relief - Grapple Boom 2a ..... 24.1 MPa (3500 psi)
16. Port Relief - Grapple Boom 2b ..... 18.6 MPa (2700 psi)
17. Valve Section - Grapple Arch
18. Port Relief - Grapple Arch 1a ..... 22.2 MPa (3225 psi)
19. Port Relief - Grapple Arch 1b ..... 18.6 MPa (2700 psi)
20. Valve Section - Decking Blade
21. Port relief - Decking Blade (Raise) ..... 22.2 MPa (3225 psi)
    Port relief - Decking Blade (Lower) ..... 22.2 MPa (3225 psi)
22. Hydraulic Valve
23. Main Relief ..... 23.3 MPa (3375 psi)
24. Priority Valve
25. Secondary Steering Pump (Optional)
26. Secondary Steering Pump Switch ..... 138 kPa (20 psi)
27. Joystick Pilot Pressure Manifold
28. Pressure Reducing Valve ..... 4.1 MPa (600 psi)
29. Main Hydraulic Pump ..... 67.0 cc/rev (4.09 cu in/rev)
30. Pressure Compensator (Standby Pressure) .... 20.68 MPa (3000 psi)
31. Solenoid Valve - Pump Unloading
32. Check Valve ..... 58.6 kPa (8.5 psi)
33. Hydraulic Oil Cooler
34. Hydraulic Tank
35. Air Pressure Relief Valve ..... 34.5 kPa (5 psi) Outlet
    ..... 3.00 kPa (0.44 psi) Vacuum Inlet
36. Hydraulic Oil Filter
37. Hydraulic Oil Filter By-pass ..... 172 kPa (25 psi)
38. Test Port
39. Pilot Joystick ..... 2.75 MPa (400 psi) Output.
40. Hand Pump - Oil Fill ..... 700 cc/stroke (42.7 in3/stroke)

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9.4 Transmission Troubleshooting

Does not respond immediately

Gear selected before controller active	Return shift lever to neutral then select a gear

Skidder moving too fast	Reduce speed

Does not shift properly

Incorrect EGS configuration	Contact an authorized dealer
Speed sensor circuit problem	

9.4.1 Transmission Controller

Green ("S) LED lit while driving

Speed signal failure broken wire	Check wiring for loose connections or Contact an authorized dealer

Orange ("T") LED blinking fast

An electrical 'short' to ground detected	Check for bare wire or pinched wiring Contact an authorized dealer

Red ("F") LED lit or flashes repeatedly

Internal hardware failure	Contact an authorized dealer

10.7 Equipment Specifications

360 Axles:	Front	Rear
Model	E12	E16D
Type	Spiral Bevel Gears (No-spin)	Hypoid Gears (Diff lock)
Overall Ratio	27.5:1	27.5:1
Flange to Flange	2134 mm (84.0 in)	2134 mm (84.0 in)
Model	E16	E23D
Type	Spiral Bevel Gears (No-spin)	Hypoid Gears (Diff lock)
Overall Ratio	27.5:1	27.5:1
Flange to Flange	2134 mm (84.0 in)	2134 mm (84.0 in)
Model	E123	E123D
Type	Spiral Bevel Gears (No-spin)	Hypoid Gears (Diff lock)
Overall Ratio	27.5:1	27.5:1
Flange to Flange	2515 mm (99.0 in)	2515 mm (99.0 in)

460 Axles: (10EB1277 - 10EB1401)	Front	Rear
Model	T36	T36D
Type	No-spin	Hydraloc
Overall Ratio	27.333:1	27.333:1
Flange to Flange	2134 mm (84.0 in)	2134 mm (84.0 in)
Model	T136	T142D
Type	No-spin	Hydraloc
Overall Ratio	27.333:1	27.450:1
Flange to Flange	2515 mm (99.0 in)	2515 mm (99.0 in)

460 Axles: (10EB1402 -)	Front	Rear
Model	T36	39R92
Type	No-spin	Hypoid Gears (Diff lock)
Overall Ratio	27.333:1	27.78:1
Flange to Flange	2134 mm (84.0 in)	2134 mm (84.0 in)
Model	T136	39R135
Type	No-spin	Hypoid Gears (Diff lock)
Overall Ratio	27.333:1	27.75:1
Flange to Flange	2515 mm (99.0 in)	2515 mm (99.0 in)