AL 140
(SN 11257 and Up)

AL 240(EU)
(SN 21244 and Up)

AL 340
(SN 31365 and Up)

AL 440(EU)
(SN 41250 and Up)

AL 540
(SN 51242 and Up)

Articulated Loaders

GEHL

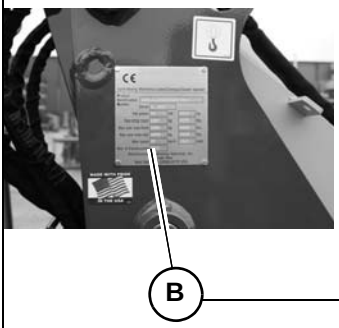
Form No.
918496
JP0118
English
Revision I

Original Instructions
–––
Supersedes 918447

Operator's Manual

Serial Number Plate Location

The serial number placard is located on the front frame on the right side of the machine (*B, Fig. 2*).



Earth-Moving Machinery/Loaders/Compact/Seated Operator

Product Identification Number				
Series				
Net power		kW		hp
Operating mass		kg		lbs.
Max axle load-front		kg		lbs.
Max axle load-rear		kg		lbs.
Max speed		km/h		mph
Year of Construction				

Manufactured by Manitou Americas, Inc.
One Gehl Way
West Bend, WI 53095-0179 USA

Figure 2 – Serial Number Plate

Additionally, the following components also have identification placards:

- Engine
- Hydraulic pump
- Hydraulic drive motor(s)
- Axles

Loader Information

Use the spaces provided below to record purchase location and date, model and serial number information.

Purchased from	
Date of Purchase	
Loader Model Number	
Loader Serial Number	
Engine Serial Number	
Hydraulic Pump Identification Number	
Drive Motor Identification Number(s)	
Axle Identification Number	

- Do not raise or drop a loaded bucket or attachment suddenly. Abrupt movements under load can cause serious instability.
- Check that attachments are securely fastened to the attachment hitch before working.
- Never activate the float function with the bucket or attachment loaded or raised, because this will cause the lift arm to lower or bucket to dump rapidly.
- Never operate the machine without a ROPS or FOPS installed.
- Machine stability is affected by: the weight of the load being carried, height of the load, machine speed, turn angle, width of the machine across the tires, abrupt control movements and driving over uneven terrain. DISREGARDING ANY OF THESE FACTORS CAN CAUSE THE MACHINE TO TIP, THROWING THE OPERATOR OUT OF THE SEAT OR MACHINE, RESULTING IN DEATH OR SERIOUS INJURY. Therefore: ALWAYS operate with the seat belt fastened around the operator.
- Do not exceed the machine's rated operating capacity; refer to operating capacity tables beginning on page 33. Be aware that effective operating capacity is reduced when the machine is turned.
- Machine stability is reduced when the machine is turned.
- Be aware that attachments effect the handling and balance of the machine. Adjust the operation of the machine as necessary when using attachments.
- Carry the load low. Move the controls smoothly and gradually, and operate at speeds appropriate for the conditions.
- Do not use the machine to lift or transport people. Do not allow others to ride on the machine or attachments, because they could fall or cause an accident.
- Always look to the rear, over both shoulders, before backing up.
- Only start the engine while seated in the operator's seat with the seat belt fastened around the operator.
- Only operate the controls while seated in the operator's seat with the seat belt properly fastened.
- Always keep hands and feet inside the operator's compartment while operating the machine.
- New operators must first operate the machine in an open area away from bystanders. Practice with the controls until the machine can be operated safely and efficiently.
- Wear safety goggles, ear and head protection as needed while operating the machine. Operator must wear protective clothing when appropriate.
- Exhaust fumes can kill. Do not operate the machine in an enclosed area without adequate ventilation. Internal combustion engines deplete the oxygen supply within enclosed spaces and may create a serious hazard unless the oxygen is replaced.

ANSI-Style and Common Safety Decal Locations (Cont.)

Note: *Refer to Fig. 4 for decal locations.*

A

Lift Point Decal

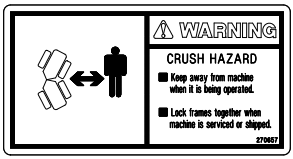
- **Located at the rear of the machine and near the lift holes/rods near the top of the front frame.**
- **Apply lift hooks only in these location See “Crane Lifting” on page 104.**

B

WARNING: Do not modify ROPS; replace damaged ROPS; wear seat belt

- **Located inside the ROPS structure.**
- **The protection offered by this ROPS will be impaired if it has been subjected to any modification, structural damage, or has been involved in an overturn incident, this ROPS must be replaced after a rollover. Seat belts must be worn while operating vehicle.**

C



WARNING: Crush Hazard

- **Located on top of the articulation joint on both sides.**
- **Keep away from machine when it is being operated.**
- **Lock frames together when machine is serviced or shipped.**

D

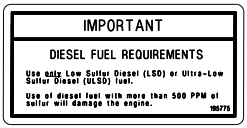
USE DIESEL FUEL ONLY!

Located next to the fuel filler neck.

E

Tie-down point, located on lift arm (front, both sides) and frame (rear, both sides). Only use tie-down points indicated on loader when transporting loader.

F



IMPORTANT

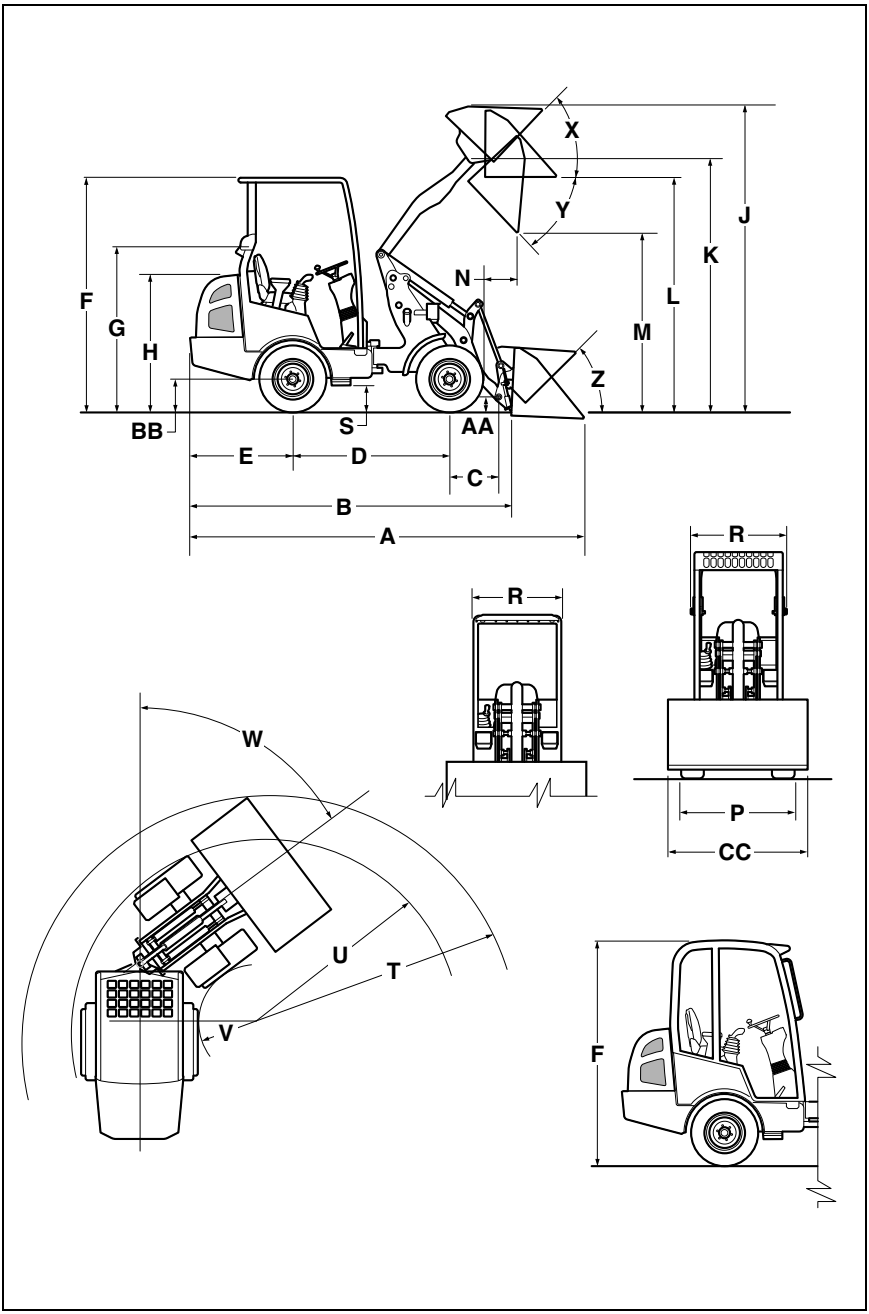
- **Located next to the fuel filler neck.**
- **Use ONLY Low Sulfur Diesel (LSD) or Ultra-Low Sulfur Diesel (ULSD) fuel.**
- **Use of diesel fuel with more than 500 PPM of sulfur will damage the engine. See “Fuel System” on page 122.**

SAE (Domestic) Weights and Capacities
AL 500 and AL 300 Series

Description	kg (lbs.)[1]					
	AL 500 Series			AL 300 Series		
	2-Post Tiltable ROPS/ FOPS[2]	4-Post ROPS	Cab	2-Post Tiltable ROPS/ FOPS[2]	4-Post ROPS	Cab
Operating Weight	3307 (7290)	3357 (7400)	3452 (7610)	2472 (5450)	2520 (5555)	2649 (5840)
Shipping Weight	3182 (7016)	3235 (7131)	3380 (7451)	2358 (5199)	2406 (5304)	2535 (5589)
Rated Operating Capacity[1, 2]	1118 (2466)	1145 (2524)	1165 (2560)	798 (1760)	834 (1840)	857 (1890)
Static Tipping Loads						
Standard Bucket[3] - Straight	2237 (4932)	2290 (5049)	2330 (5136)	1597 (3521)	1670 (3681)	1721 (3794)
SAE J732 Standard Bucket[2] - 45° Turn (Domestic)	1771 (3904)	1800 (3969)	1860 (4101)	1244 (2743)	1280 (2821)	1319 (2907)
Standard Pallet Forks[4] - Straight	1634 (3602)	1682 (3708)	1703 (3755)	1098 (2420)	1169 (2578)	1247 (2750)
SAE J1197 Standard Pallet Forks[3] - 45°Turn (Domestic)	1278 (2817)	1333 (2939)	1352 (2981)	857 (1889)	909 (2005)	977 (2155)

1. Measured on firm and level ground. Equipped with full fluids and 75 kg (165 lbs.) operator.
   AL 500 Series equipped with 33x15.5-16.5 tires, fluid-filled rear tires (air-filled rear tires have reduced capacities) and counterweight.
   AL 300 Series equipped with 30.5X12.5-16.5 tires.
2. 2-Post ROPS not available in Europe.
3. AL 500 Series equipped w/ 1524 mm (60”) dirt/construction bucket.
   AL 300 Series equipped w/ 1372 mm (54”) dirt/construction bucket.
4. Equipped w/ pallet forks with 1067 mm (42”) tines and 533 mm (21”) load center.

AL 300, AL 200 Series Dimensions



No.	Item	Description
1	Steering knob	Use to turn steering wheel.
2	Instrument panel	Contains warning indicators, operation indicators, and gauges (page 54).
3	Steering wheel	Turn to control travel direction.
4	Accelerator pedal	Press to control engine/travel speed.
5	Multi-purpose joy-stick	Use to control lift arm/attachment maneuvering and loader drive direction (page 83).
6	Auxiliary hydrau-lics control buttons	Use to activate auxiliary hydraulics control circuit (page 97).
7	Parking brake lever	Use to engage parking brake (page 72).
8	Operator's seat	Adjust operator's seat position (page 59).
9	Brake/inch pedal	Press to control gradual travel and braking (page 79).
10	Steering column tilt	Use to adjust steering column tilt (page 60). ***AL 300, AL 400, AL 500; AL 100 (EU), AL 200 optional.***
11	Hazard light switch	Press to activate hazard lights. ***AL 300, AL 400, AL 500; AL 100 (EU), AL 200 optional.***
12	Work light switch	Press switch to ON position to activate work lights.
13	Rotating beacon switch (option)	Press switch to ON position to activate optional rotating bea-con.
14	Battery disconnect switch (option)	Use switch to connect/disconnect the battery and electrical circuit (page 72). ***EU models only.***
15	Seat belt	Always fasten seat belt before operating loader (page 12).
16	Control lever	Controls road lights, directional indicators and horn (page 61). ***AL 300, AL 400, AL 500; AL 100 (EU), AL 200 optional.***
17	Power-A-Tach® system lock/unlock (option)	Use to lock/unlock attachment.
18	Drive direction switch	Use to control forward/reverse drive direction (page 79).
19	Seat plate	Seat plate according to ISO 7096 (located on seat).
20	Hand throttle	Controls engine speed independently from the accelerator pedal. Does not control travel speed (page 61). ***AL 300, AL 400, AL 500.***
21	Slow/fast speed toggle switch	Toggles between slow/fast travel speed modes. Indicators 11 and 14 (page 54) illuminate to show selection (page 81). ***AL 300, AL 400, AL 500***
22	Differential lock switch	Engages differential lock when depressed. Indicator lamp 5 (page 54) illuminates when the differential lock is engaged (page 81). ***AL 300, AL 400, AL 500.***
23	Horn	Press to activate horn. ***AL 100 Series only; horn button located on "16 – Con-trol Lever" on other models.***
24	Lift/Tilt lockout switch	Press to deactivate lift and tilt hydraulic functions (page 77). ***AL 400 Series (SN 41573 and up), AL 500 Series (SN 51931 and up) only.***

Pre-Operation Checklist

Check the following before starting the machine (for all fluid level checks, fill if required):

- Fuel, hydraulic, radiator, and engine oil caps for tightness.
- Fluid leaks: fuel, hydraulic oil, engine oil, coolant, etc.
- Radiator coolant level. See “Fluid Capacities/Lubricants” on page 31 for proper mixture.
- Engine coolant level and system for leaks.
- Hydraulic system for leaks.
- Fuel level. See “Fuel System” on page 122.
- Engine oil level. See “Checking Engine Oil Level” on page 115.
- Hydraulic fluid level. See “Checking Hydraulic Oil Level” on page 128.
- Engine cover latch securely fastened.
- Clean engine area of flammable materials.
- Engine fan and accessory belts.
- Air cleaner (air filter restriction indicator). See “Air Cleaner” on page 118.
- Intake hoses.
- Hydraulic hose condition.
- Brake fluid level.
- Tire condition and pressure.
- Condition of any attachments to be used.
- Lift arm and cylinder condition (look for bends/cracks/etc.).
- Frame condition (look for bends/cracks/etc.).
- Cab / ROPS (Rollover Protective Structure).
- FOPS (Falling Object Protective Structure).
- Guards.
- Safety decals (replace as required).
- Safety warnings (securely attached and readable).
- Seat belt (check for proper function/binding) and mounting hardware.
- Horn
- Lights.
- Pivot points for proper operation.
- Broken and/or loose parts (repair as required).

5. Place forward/reverse drive switch (*Fig. 33*) on the top of the joystick into the neutral position.

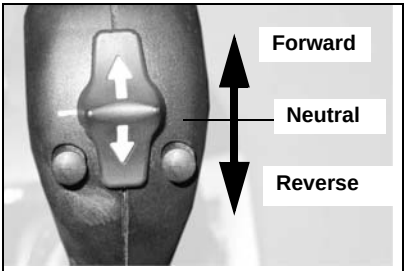


Figure 33 – Drive Direction

6. Turn the ignition key to the "I" (Run) position (*Fig. 34*).
7. When the pre-heat indicator light (*B, Fig. 34*) goes off, turn the ignition key to the "II" (Start) position. Release the key when the engine starts.
8. If the engine does not start after 15 seconds, turn the key back to the "0" (off) position, wait one minute and repeat steps 6-7. If the engine does not start after several attempts, see "Troubleshooting" on page 157.

Note: *Return switch to the "0" position between starting attempts.*

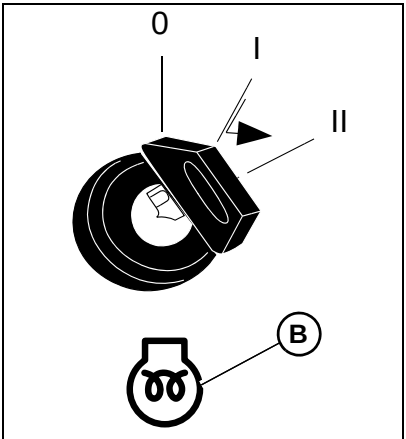


Figure 34 – Ignition/Pre-Heat

9. Immediately after starting the engine, all warning indicator lamps should go off (see "Warning Indicators" on page 58).
10. Proceed to "Warm-up" on page 74.

Multi-purpose Joystick

Use the multi-purpose joystick to control lift arm/attachment hydraulic movements. Speed of movement is proportional to how far the joystick is moved and engine speed.

Lift arm:

A. Move the joystick rearward (A, *Fig. 48*, *Fig. 49*) to raise the lift arm.

B. Move the joystick forward (B) to lower the lift arm.

Attachments:

C. Move the joystick to the left (C) to tilt attachments rearward.

D. Move the joystick to the right (D) to tilt attachments forward.

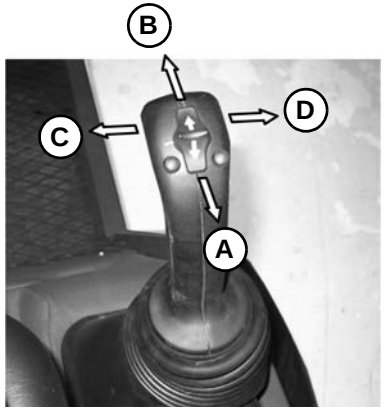


Figure 48 – Multi-purpose Joystick

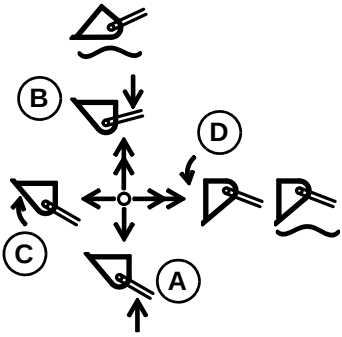


Figure 49 – Joystick Function Decal

Auxiliary Hydraulics Connections

Important: *Relieve pressure in the auxiliary hydraulic circuit before connecting / disconnecting hydraulically powered attachment hoses. See "Auxiliary Circuit Pressure Relief" on page 91.*

Important: *Be sure that the hydraulic connections are clean. Hydraulic oil contamination can damage the hydraulic system.*

⚠ CAUTION **If a Power-A-Tach® system hitch is installed, connect the auxiliary hydraulic connections to the attachment after connecting the attachment to the Power-A-Tach® system hitch. Disconnect the auxiliary hydraulic connections before disconnecting the attachment from the Power-A-Tach® system hitch.**

To connect: Press the hose connections firmly down into the auxiliary hydraulic connections until they snap into place.

To disconnect: Push down on the locking rings (*N, Fig. 66*) until the hose connections release.

Important: *Always cap the hydraulics* (*Fig. 50*) *after disconnecting, to protect against hydraulic oil contamination.*

Note: *Connect attachment connectors together when the attachment is not being used, to keep pressure from building in the attachment and to keep the connector mating surfaces clean.*

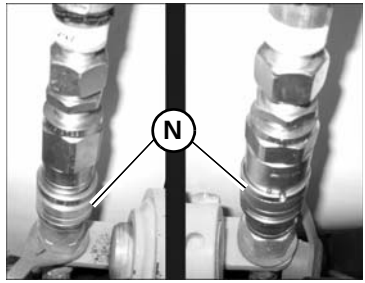


Figure 66 – Auxiliary Hydraulic Connections

11. Secure the machine to the transport vehicle at the tie-down points (*T, Fig. 75* and *U, Fig. 76*) to prevent the machine from moving during transport in accordance with applicable over-the-road hauling regulations.

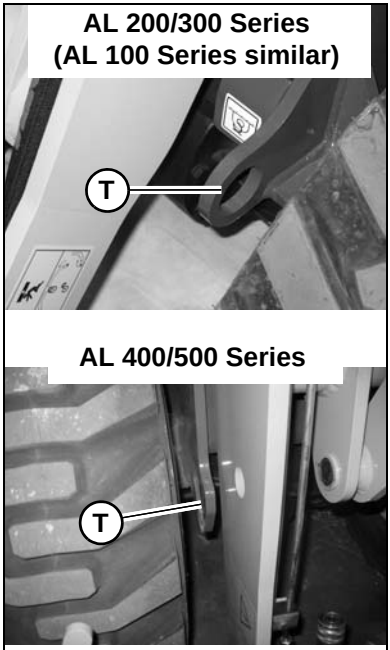


Figure 75 – Front Tie-down Points (both sides)

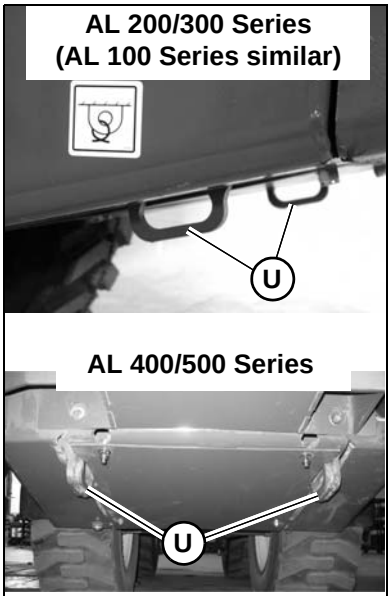


Figure 76 – Rear Tie-down Points (both sides)

Dealer Service

The following service items require special tools and knowledge and should be performed only by an authorized dealer:

- Engine service not included in this manual
- Hydrostatic components
- Hydraulic system pumps
- Hydraulic valves
- Hydraulic cylinders
- Electrical components other than battery and circuit breakers

Tilting the Platform

⚠ WARNING Always close the cab doors (if applicable) and open the engine cover before tilting the platform. Stay clear from underneath the platform as it is tilted. Always secure the tilt support when platform is tilted.

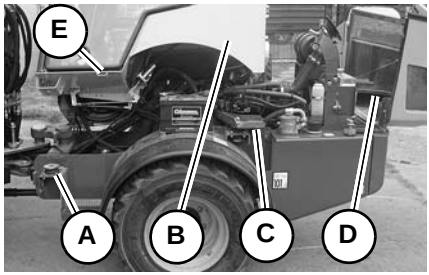
Tilting Up the Platform

1. Complete "Mandatory Safety Shutdown Procedure" on page 10.
2. Open engine cover (*D, Fig. 80*).

Note: *The platform is locked in the lowered position when the engine cover is closed.*

3. Remove the platform lock-down hardware from the left front (*A*) and left rear (*C*) of the platform (*B*).

   Note: *AL 100 Series machines, have lock-down hardware at both the right and left front of the platform at position (A).*



A. Platform, Front Mounting
B. Platform
C. Platform, Rear Mounting
D. Engine Cover
E. Steering Lock Bar Lever Insert

Figure 80 – Tilted Platform

3. Shut off the fuel supply by turning the fuel shut-off valve on top of the water separator to OFF.
4. Remove the fuel filter.

⚠ WARNING Watch for, and catch, any fuel drips or leaks. Wipe up spilled fuel and immediately dispose of rags used to clean up fuel spills. Fuel vapors can ignite and cause severe burns.

5. Clean the fuel filter gasket and the fuel filter mounting surfaces where they contact each other with a clean cloth.
6. Lubricate new fuel filter gasket with diesel fuel.
7. Install and tighten the filter 3/4 turn past the point the where the gasket contacts the filter head.
8. Turn shut-off valve on water separator to ON.
9. Prime the fuel system by turning the ignition key to the ON postion without starting the engine for 30 seconds.

⚠ CAUTION Do not use the starter motor to crank the engine to prime the fuel system. Damage to the engine starter motor, coils, pinion/ring gear could result.

Water Separator Maintenance

The water separator contains an indicator ring that floats on top of accumulated water. Under normal conditions, this ring sits at the bottom of the separator. If the ring is somewhere between the bottom of the separator and white ring (*B, Fig. 95*), then accumulated water must be drained.

Important: *Water in the fuel system can cause severe engine damage. Drain water from the fuel filter/water separator anytime water is present.*

1. Perform the “Mandatory Safety Shutdown Procedure” on page 10.
2. View the water separator through the slot in front of the right-rear tire, near the step.
3. Access the water separator from underneath the loader, near the right-rear wheel. Check for water in water separator by checking the level of the float in the water separator bowl. If water is present, complete steps 4-7.
4. Turn the fuel shut-off valve lever (*A, Fig. 95*) on the water separator to the OFF position.

Changing Axle Oil (AL 200 and AL 100 Series)

1. Position waste oil collection containers, with capacities of at least 5 liters (5 quarts) underneath the axle centers to catch oil as it drains.
2. Thoroughly clean around axle drain plugs (*M, Fig. 109*) and remove the plugs.
3. Thoroughly clean around axle fill plugs (*O*) and remove the plugs. Allow the oil to completely drain.

Important: *Always dispose of waste oil according to environmental laws or take to a recycling center for proper disposal. DO NOT pour onto the ground or down a drain.*

4. Thoroughly clean axle drain plugs. Replace and tighten the plugs.
5. Add oil through the oil fill holes (*O*) until it reaches the bottom of the holes. See "Fluid Capacities/Lubricants" on page 31 for the specific oil type and grade.
6. Thoroughly clean fill plugs (*O*). Replace and tighten the plugs.

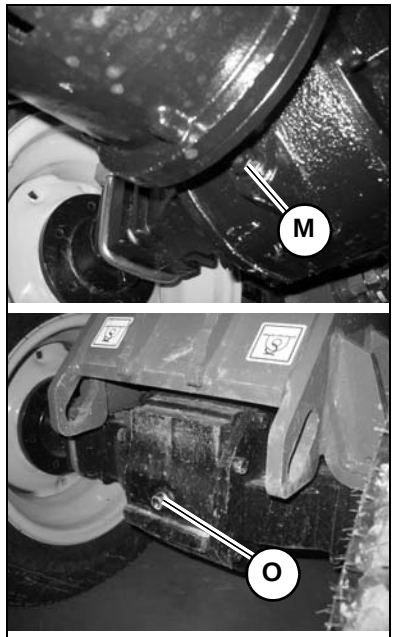


Figure 109 – Axle Oil Drain/Fill

Cab and In-Line Fuses

Cab fuses (*L, Fig. 119*) are located in the engine compartment at the right rear corner of the operator's platform. Open the engine cover to access these fuses.

Additional in-line fuses are located in the wire harness under the platform.

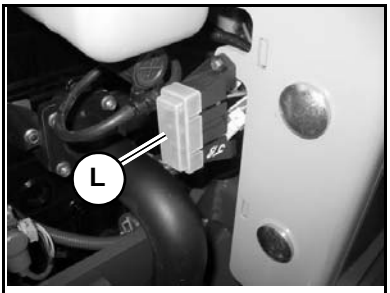
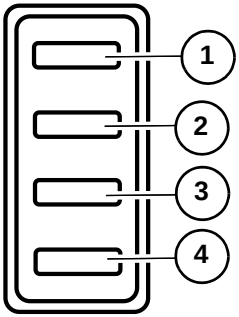
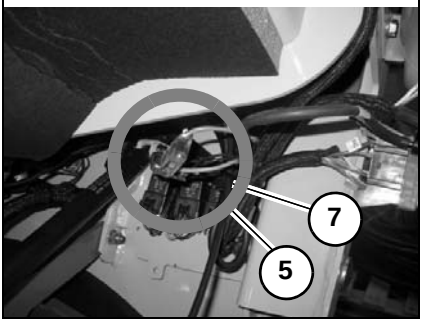


Figure 119 – Cab Fuse Block (inside engine compartment)

Cab Fuses (located inside engine compartment)



In-line Fuses (located under platform near engine compartment)



Main and In-line Fuses (located under platform) AL 500 Series Shown - other machines similar

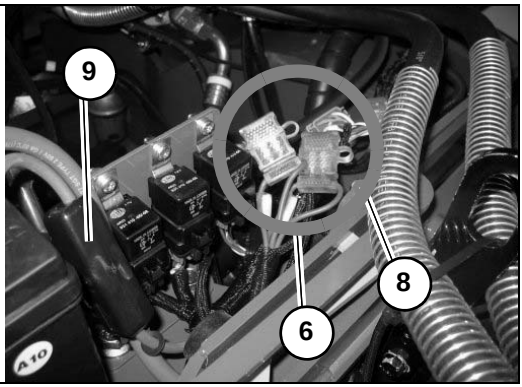


Figure 120 – Cab, Drive, Starter, Glow and Main Fuses

Machine Disposal

Make sure all materials are disposed of in an ecologically sound manner.

Recycling the machine in accordance with the current state of the art at the time of recycling. Observe all accident prevention regulations.

Dispose of all parts at the at the recycling sites specific to the material of the part. Take care to separate different materials for recycling.

Hydraulic System Troubleshooting

Problem	Possible Cause	Corrective Action
Lift and/or tilt functions inconsistent/jerky	Air in hydraulic system	Cycle lift and tilt cylinders to maximum stroke and maintain pressure for short time to clear air from system
	Low hydraulic oil level	Add oil and check for leaks
	Cylinder(s) malfunction	Contact dealer
Travel drive performance inconsistent/jerky	AL 100 Series hydraulic tanks not evenly filled	See “Checking Hydraulic Oil Level” on page 128.
Lift arm does not maintain raised position with multi-purpose joystick centered (neutral)	Oil leaking past lift cylinder seals (internal or external)	Contact dealer
	Oil leaking past lift spool in control valve	Contact dealer
	Leaking hydraulic hoses, tubes or fittings between control valve and cylinders	Contact dealer
Auxiliary hydraulics do not function	Spool in control valve not actuated or leaking	Contact dealer
	Hydraulic oil leaking past seals	Contact dealer
	Auxiliary hydraulic connections improperly connected	Correct hydraulic connections
Auxiliary hydraulics connections difficult to connect/disconnect	Auxiliary hydraulics circuit under pressure	Relieve auxiliary hydraulics circuit pressure—see “Auxiliary Circuit Pressure Relief” on page 91