Section 3

Maintenance

3.1 General

Maintenance people whose job is the upkeep of this equipment should have a basic understanding of the equipment and normal sequence of operation.

Maintenance in this section is divided into two parts – Preventative Maintenance and Corrective Maintenance (Troubleshooting).

Preventative Maintenance is a series of routines that keep the equipment in proper working condition. Preventative Maintenance is not only desirable but is necessary, since scheduled inspection ensures continued, trouble-free operation of the equipment. It also prevents or at least detects at an early stage, mechanical or hydraulic troubles that might otherwise develop into equipment malfunction. Maintenance should do preventive maintenance every 40 hours of standard use.

Corrective Maintenance (Trouble-Shooting) is the examination and repair or replacement of the part or parts of the equipment that resulted in equipment malfunction.

3.2 Safety Precautions

Practice safe maintenance habits to prevent personal injury or equipment damage.
WARNING: BEFORE MAINTENANCE IS BEGUN, STUDY THE JOB CAREFULLY TO DETERMINTE ALL THE HAZARDS PRESENT AND TO SEE THAT ALL NECESSARY SAFEGUARDS OR SAFETY LOCKOUT DEVICES ARE PROVIDED TO PROTECT YOURSELF AND THE EQUIPMENT.

Place (2) 4x4 hardwood or steel supports between the tilt frame and stabilizer frame as a safety precaution when unit is in the up position for repair.

3.3 Suggested Preventative Maintenance Program

Suggested preventative maintenance checks list are suggested. Perform these checks at the suggested time.

3.3.1 Lubrication and Maintenance Program

The entire unit should be checked daily, paying attention to the following:

1) Check hinges, welds, pivot pins, cylinders and retaining rings on pins, cotter pins and clips.
2) Inspect hydraulic lines for leaks or damage.
3) Check oil level in tank for correct height.
4) Inspect pump, valve and cylinders for leaks, and proper pressures
5) Check universal joint setscrews and lock wires for looseness (PTO). Check coupling on engine driven units.
6) Check electrical connections for corrosion.
7) Check control linkage for binding, corrosion and looseness, making certain all cotter pins are in place.
8) Check safety hooks and brakes for wear. Adjust brakes as required.
9) Check oil level in wheel bearing.
10) Check suspension parts and U-bolts. Per suspension requirements (see suspension addendums in manual and on trailer)
11) Check wheel or rim nuts for proper tightening

12) Check cable for fraise and splits
13) Lubricate air pin locks daily.
14) Grease ALL pulleys and ALL pivot pins weekly

Do's and Don'ts of Trailer

Don'ts

1) Do not lift, dump, load or unload when suspension is extended.
2) Do not travel with stinger tail out.
3) Do not jerk cable when loading or unloading as cable may snap and break.
4) Do not load, dump or unload unless rear axle air bag is emptied Air ride only.
5) Do not operate rear unit when operating front unit ART-60-BT Only.
6) Do not load, unload or dump unless air locks are locked.
7) Do not extend stinger tail when cable is around the tail.
8) Do not slide suspension when hydraulic hoses or airs are connected. (B-Train Only)
9) Do not lower front of trailer while front of container is on the end of extended stinger tail.
10) Do not raise trailer with lift axle down, Raise lift axle before raising hoist
11) Do not lower tilt frame while loading heavy container till container is past hinge point

Do's

1) Do tighten cable slowly until cable is tight (keep cable tight at all times)
2) Do make sure unit is on level ground when loading, unloading or dumping.
3) Do travel with all air bags leveled.
4) Do slide suspension when air bags are leveled.
5) Do make sure all landing gear is up when traveling.
6) Do make sure winch is in low speed while lifting heavy load.
7) Make sure container is proper secure before traveling
8)

3.3.2 Lubrication

General
When the unit is used regularly, it should be lubricated weekly or more often if conditions warrant. Use grease recommended for truck chassis lubrication.

Grease Fittings

Lift Cylinders	4
Stabilizer Frame	4
Winch	2
Slack adjuster	4 – 6 Tri-Axle
Rollers - Periodically remove roller to make sure pin is taking grease	14
Landing Gear	2
Pulley	5
Air lock pins	2

**Grease sliding suspension and stinger tail daily.*
PINS MAY BE NEED TO BE REMOVED TO ENSURE PROPER GREASE IS BEING APPLIED

3.4 Hydraulic Oil

Check color of oil for possible contamination. If oil appears thick or dirty, drain system and refill. Clean and/or replace custom filter (optional). Change oil Three times a year.

When adding or replacing oil, use hydraulic oil that contains an anti-foamant, rust and oxidation inhibitor, and an antiwear additive. DO NOT use low viscosity naphtha base motor oil, hydraulic brake fluid, or aircraft hydraulic fluid.

WARNING: WHEN REPLACING OR ADDING Oil. BE VERY CAREFUL THAT FOREIGN MATTER IS KEPT OUT OF THE SYSTEM.

NOTE: For cold weather operation below 20 Degrees Fahrenheit, contact local oil distributor for proper low temperature oil.

All internal cylinder parts are lubricated by hydraulic oil in the circuit. Particular attention must be paid to the condition and level of the oil in the circuit. Dirty oil is one of the main causes of hydraulic component failure resulting in expensive downtime. Dirty oil is detectable; a sample on a dipstick will show its condition. Take the sample and put a drop on a blotter cloth or paper, any revealed residue means dirty oil. To replace the oil supply, drain and flush the entire system and clean or replace any filter screens. Fill the system with new oil suitable and recommended for use in circuits involving Ace Equipment Sales Inc. cylinders with the following specifications. These suggestions are intended as a guide only. When purchasing hydraulic oil, show these specifications to your oil supplier for final oil recommendations.

General Recommendations:

Oil should be checked daily, added to if needed and changed on a regular schedule along with filters and filter screens in accordance with the manufacturer's recommendations. Hydraulic system should be flushed periodically. Oil poured into the reservoir should pass through a 10 micron element. Pour only clean oil from clean containers into the reservoir. Reservoir capacity should equal, in gallons, the pump output in G.P.M. or the total G.P.M. of all pumps where there is more than one in the system. Oil operating temperature should not exceed 200°F (93°C) with a maximum of 180°F (82°C) usually recommended. 120°F (50°C) to 140°F (60°C) is usually considered optimum. High temperatures result in rapid oil deterioration and may indicate the system requires an oil cooler or larger reservoir. The closer to the optimum temperature, the longer the service life of the oil and the hydraulic components. Don't pollute. Conserve resources and return used oil to a collection center.

Viscosity Recommendations:

Approximately 100 SSU is considered optimum operating viscosity.
50 SSU Minimum @ Operating Temperature
7500 SSU Maximum @ Starting Temperature
150 to 225 SSU @ 100°F (37.8°C) (Generally)
44 to 48 SSU @ 210°F (98.9°C) (Generally)
• Approximate SSU at...

Oil Grade	100° F (37.8° C)	210° F (98.9° C)
SAE 10	150	43
SAE 20	330	51

Normal Temperature:

0°F (-18°C) to 100°F (37.8°C) Ambient
100°F (37.8°C) to 180°F (82.2°C) System
Note: Where sustained temperatures exceed the above, use an oil suitable to the ambient temperature of your region. For a suitable replacement, consult your oil supplier.

Other Desirable Properties and Characteristics:

Viscosity Index - 90 minimum.
Aniline Point - 175 minimum.

Stability of physical and chemical characteristics. High demulsibility (low emulsibility) for separation of water, contaminants and air. Resistant to the formation of gums, sludges, acids, tars and varnishes. High lubricity and film strength.

Notice

Never use a detergent oil, crank case drainings, kerosene, fuel oil, or any non-lubricating fluid (such as water) in the hydraulic system.

3.4.1 Draining Hydraulic System

The easiest and most effective way to drain the hydraulic system is to simply disconnect all hoses at their adapters and allow oil to drain into suitable containers.

Work controls through all positions in order to thoroughly drain the control valves.

After system has been drained, remove flange on side of tank. Flush out inside of tank with kerosene. Remove and clean suction filter and/or replace.

Reconnect all hoses at their adapters; replace flange and filter; refill tank with proper type oil to within 6 inches from the top with cylinders retracted. (West kit uses about 35 gallons, 50 gallons for ART-60-BT.)

With all controls in NEUTRAL, start hydraulic system and operate all cylinders at least three (3) cycles to remove all air from the lines. Check oil level and add if required.

WARNING!

Rollover or lateral tilt can cause severe injury or death and/or damage to the unit and cylinder.

The hydraulic cylinder will not prevent the dump body or trailer from rollover or lateral tilt. The cylinder is strictly a lifting device and is not a structural member of the unit. Cylinders are not to be used as a means of stabilizing the unit. The hydraulic cylinder mounted in the unit should be free to find its own trajectory line of extension, free of any lateral loading of the plungers. Misalignment of the top or bottom mountings, or mounting pins too tight, may cause scoring of the plungers, leaking, or improper sequencing which could cause the unit to upset. The hydraulic cylinder will not withstand lateral pressure when the unit is leaning. Only activate the cylinder when the tractor and trailer are in a straight line (not jack-knifed). Do not activate the cylinder while on unlevel or soft ground, or during heavy crosswinds. Doing so may cause the unit to upset. Do not activate the cylinder while personnel or equipment are alongside or behind the dump body or trailer.

The operator should stay at the controls during the entire dumping operation. If the body starts to lean, the operator should immediately lower the dump body or trailer. It is important to slowly position the cylinder control valve into the hold position to avoid subjecting the cylinder to high pressure. Do not overload the unit. The load must be distributed evenly during loading or unloading to avoid rollover and lateral tilt. Loads stuck while the cylinder is partially or completely extended increases the hazard of rollover and lateral tilt. Lower the dump body or trailer entirely with the
cylinder control valve partially open (avoid lowering the dump body or trailer with the cylinder control valve completely open). Then unload the dump body or trailer manually or with an alternative mechanical aid.

WARNING!

Shock pressure can cause severe injury or death and/or damage to the unit and cylinder.

Do not use the cylinder to loosen loads stuck in the dump body or trailer. Lower the dump body or trailer entirely with the cylinder control valve partially open (avoid lowering the dump body or trailer with the cylinder control valve completely
open). Then unload the dump body or trailer manually or with an alternative mechanical aid. Do not move the truck and jam the brakes while the cylinder is partially or fully extended to loosen loads stuck in the dump body or trailer.
Lower the dump body or trailer entirely with the cylinder control valve partially open (avoid lowering the dump body or trailer with the cylinder control valve completely open). Then unload the dump body or trailer manually or with an alternative mechanical aid. Do not move the truck until the dump body or trailer is lowered completely.

WARNING!

Over pressurizing the cylinder can cause severe injury or death and/or damage to the unit and cylinder.

Do not operate the cylinder at pressures greater than 2,000 P.S.I. unless otherwise approved in Ace Equipment Sales, Inc.

WARNING!

Worn or damaged hydraulic hoses can cause severe injury or death and/or damage to the unit and cylinder.

Hydraulic hoses should be checked regularly and replaced if worn out or damaged.

NOTICE!

Do not drive the unit while the P.T.O. or hydraulic pump is engaged. The hydraulic oil should be checked and changed regularly to avoid contamination leading to internal cylinder damage.A damp to light film of oil on each plunger indicates a
good cylinder operation. A small accumulation of oil may be noticed on the plunger at the head nuts after many cycles. This should not be mistaken for packing leakage. It is advisable to bleed air from the cylinder weekly to free entrapped air. This will result in a smoother operation. Grease the pin mountings regularly.

3.5 Corrective Maintenance (Trouble Shooting)

The operation of any mechanical, hydraulic or electrical system depends on the care given to the various parts. This section is a general guide to the causes of equipment failure.

3.5.1 Safety

Respect the potential danger of the equipment.

3.5.2 Trouble Chart

To aid maintenance personnel in locating and correcting a problem, a trouble chart has been included.

Symptom	Likely Problem	Remedy
Failure to slide	Air bags deflated	Inflate bags
	Unit misaligned	Straighten suspension
	Airlock inlock	Check airline trailer brake off
	Obstruction	Remove item
	Pins will not move	Release pins, move trailer

		forward
Airbags won't inflate	No air	Fill air tank
	Loose Line	Fix line
	Levelers in up position	Adjust lever rods
Won't dump air	Pilot valve closed	Check valve
	Air leak	Fix air line
Failure to lift cylinder	No Oil	Check Oil
	Blown packing	Replace packing
	Busted line	Replace line
	Pinched line	Relocate hose
	Not enough pressure	Adjust pressure
		Check pump
Control valve not working	Not full stroke	Check controls
	Not enough oil	Fill oil
Winch one speed	Selector not working	Check selector
Won't lift	No pressure	Check pressure
		Check oil
		Check pump