



# **CITY OF ANACORTES**

## **OPERATIONS MANUAL FOR STREET, SEWER, & STORM DEPARTMENT**

*1/1/05 REV*

**SECTION 1**  
**ACCIDENTS AND INJURIES**

**1-01 EMPLOYEES RESPONSIBILITY CONCERNING ACCIDENTS, INJURIES, AND OTHER NEAR MISSES.**

Regardless of severity, every city employee must report immediately to his or her supervisor all injuries, accidents and near misses incurred in the performance of duties. Prompt reporting of injuries is a requirement of state and federal law. Failure to report an injury promptly could make the injured person ineligible for industrial compensation.

Report all equipment damage to your supervisor/foreman immediately.

Use safety equipment as directed- **DON'T TAKE ANY CHANCES.**

When in doubt ask questions about any phase of your job, and follow instructions.

Report all unsafe situations or conditions that are potentially hazardous.

Operate only the equipment your are qualified to operate.

Talk to management at any time about problems that affect your safety.

The most important part of this program is the individual employee-YOU! Without your cooperation, the most stringent program can be ineffective. Protect yourself and your fellow workers by following the rules. **REMEMBER:** Work safely so you can go home to your family and friends- they need you.

All injuries, serious or minor, shall be reported on City Accident Form.

**1-02 DISASTER EMERGENCY: Fire, Earthquake, Etc.**

No building, equipment, or material of any kind is worth a human life.

Any Municipal Building Disaster: Follow Building Evacuation Plan for each individual building.

**Site specific plans will conform to WAC:**

The location of evacuation exits.

Fire extinguishers, emergency lighting, first aid and BBP kits, medical water bottles, emergency eye wash stations and showers shall be clearly marked.

Steps for a general disaster:

Remove injured people, if any, from danger area. Warn people in area  
Of danger, control crowds. Assist any physically or visually impaired  
from area.

Assign a person to call the Fire department – 911. Report exact Locations of disaster (fire etc.) and answer all questions calmly.

Confine the dangers, if possible.

Designate a person to go to the street entrance and direct emergency Personnel.

In the case of fire, be sure to use extinguishers suitable for the specific type of fire.

#### 1-03 **FIRST AID – BLOOD BORNE PATHOGEN**

All work places shall have the type and size first aid kit and blood-borne pathogen kit required by the general safety and health standards of the State of Washington Reference – City Emergency Response Plan, blood-borne pathogen plan and Safety plan.

All City vehicles or motorized riding equipment shall be required to carry not less than (1) ten-unit first aid kit and blood-borne pathogen kit. The kits shall be kept in such a manner as to make it readily available in case of an emergency.

A minimum of one for ever three permanent City employees per job site will be certified in first aid and will also receive blood-borne pathogen training. all part-time employees with occupational exposure shall receive blood-borne pathogen training within 10 days of employment.

### GENERAL SAFETY

#### 1-04 **PERSONAL CONDUCT**

All employees shall conduct themselves in a manner that assures maximum safety to all person affected by their actions

At no time shall employees engage in practical jokes, scuffling, horseplay, or misuse of City equipment.

The use of alcohol or drugs (except as prescribed by a qualified physician) during working hours is prohibited. Violation of this policy is sufficient cause for determination of employment.

Any source of ignition, including smoking, is prohibited in any area where a match, flame spark or careless disposal of lighted material constitutes of fire hazard.

Personal work clothing shall be suitable for the individual job and be of the type offering maximum protection from accidental injury. Use good judgment about

loose clothing, jewelry, or hanging objects worn while working around moving equipment.

Hard hats will be worn in construction sites, in electrical substations, in any work area where there is a potential hazard from falling objects, and by all certified traffic flaggers.

Proper eye protection will be worn when you are exposed to flying objects, dust, harmful rays, chemicals, flying particles, etc.

Proper footwear will be worn as necessary for the particular job, in accordance with WISHA and OSHA.

Gloves, aprons and/or other protective clothing will be used when handling chemicals, hot or cold materials or rough materials.

#### 1-05 **JOB HAZARDS**

Every employee shall be alert for possible hazards that could result in an accident, and act promptly to eliminate the hazard. If the hazard cannot be corrected immediately, report the problem to the immediate supervisor.

Report all accidents, injury or non-injury, to your immediate supervisor. When you have been involved in an accident, a lesson has been learned. This lesson is of valuable use to others to prevent their suffering a similar accident. The investigation shall focus on finding the cause, so that future preventative measures can be explored.

Supervisors/foreman shall promptly investigate all reported hazards and accidents. Hazards that could cause or contribute to accidents shall be immediately corrected. After correction, a follow-up inspection and report shall be scheduled to assure that corrections remain effective.

A copy of each reported hazard or accident shall be sent to the Human Resources Director for coordination with other departments and review.

Each division within the City shall have hazard control plans in place that coincide with specific jobs. All employees shall be trained in their individual work area hazards and be aware of said plan-policies. An example is the lock-out/tag-out policy at the water treatment plant.

#### 1-06 **PERSONAL PROTECTIVE EQUIPMENT**

Prescribed protective equipment shall be used at all times in work areas as designated by safety procedures.

Approved hard hats shall be worn when the employee is exposed to a potential hazard from falling objects or when working in a construction area or an electrical substation.

Approved hard hats will be required in work areas where possible hazards from falling objects are not present but protection from bumping type injuries is required.

WAC 296-24-088 and City policy require employees to wear steel-toe safety shoes where there may be a risk of foot injury and/or in any area that requires hardhats.

Goggles, face shields and other suitable protection devices shall be worn when employees are exposed to possible flying particles or possible splashing from chemicals.

Approved respiratory masks shall be used when employees are exposed to concentrations of dust, fumes, vapors, gases or airborne pathogens.

Approved hearing protectors must be worn when working in areas having high noise levels.

Safety devices and guarding provided to protect the employee from injury shall be used at all times and shall not be removed or blocked by operating personnel.

Protective equipment shall be kept clean and free from damage. Frequent inspections shall be performed to assure protective equipment offers maximum protection. Damaged or defective protective equipment or clothing shall not be used and shall be replaced or repaired prior to use.

#### 1-07 **HANDLING OF MATERIALS**

Employees are limited to continuous lifting of weights of 60 pounds or less. Heavier weights are permitted on an intermittent basis.

Where possible, mechanical equipment should be used to lift heavier materials. If mechanical assistance is not available, adequate manpower to maintain the 60 pound limit per employee will be required.

All employees are responsible to know and practice proper lifting techniques.

Safety is the first priority in determining the methods and procedures used to handle and/or transport materials.

### **WORK AREA SAFETY**

#### 1-08 **WORK AREA**

Employees shall not be required to work in areas or situations where they may be adversely affected by working under those conditions, (i.e. extreme heights, underground, closed areas, etc.) without proper protective devices.

Always store materials in a safe manner. Tie down or support piles if necessary to prevent shifting, falling or rolling.

Shavings, dust, scraps, oil or grease should not be allowed to accumulate.

Any refuse must be removed as soon as possible. It is a safety and fire hazard.

Remove any loose materials from stairs, ramps, walkways, platforms, etc.

Do not block traffic lanes, aisles, fire exits, stairs, etc.

Avoid shortcuts – use stairs, walkways, ramps ladders, etc.

Erect proper barriers around floor openings and excavations. See codes for proper use.

#### 1-09 **ELEVATED POSITIONS**

Employees shall use approved safety belts, lifelines or other devices that are adequate for maximum protection while working at heights. No person, material or equipment shall be lifted from the ground by supports inadequate for the job. The supports or lines shall be approved supports, sufficiently strong and properly secured in place.

All ladders used shall be of good quality securely placed, held or tied to prevent slipping or falling, as per WAC codes. Ladder shall not be placed in front of doorways unless the door is open, locked or guarded. Employees shall face the ladder when ascending or descending. Materials that interfere with the free use of both hands shall not be carried up or down the ladder.

Wooden or non-conducting ladders shall be used by electrical workers and others working near electrical equipment. Straight and/or extension ladders shall have safety feet.

Scaffolding shall be built as per WAC codes.

Additional policies that are specific to the department or the project may be established and are applicable.

#### 1-10 **UNDERGROUND INSTALLATIONS**

Underground installations include tanks; pits, pipes, sewer or any underground facility workers may enter to perform maintenance or inspections. Workers must follow confined space entry policies developed for the particular department, conforming to state and federal laws regulating confined space entry.

Warning signs and barriers shall be placed around open manholes to provide sufficient warning of the opening and to prevent unauthorized traffic from entering the area.

Workers shall not enter sewers or other underground installations without leaving a safety observer in attendance on the outside. The safety observer shall frequently monitor the operation and approaching traffic.

Before entering underground structures, the atmosphere of the structure shall be tested with an approved testing device (tested and calibrated within the required time period) to detect the presence of explosive gases or oxygen deficiencies.

Personnel shall not enter or work in underground facilities where concentrations of fumes, vapors, gases or oxygen deficiencies are present, with protective devices.

Smoking, open flames and spark-producing equipment shall not be permitted in or within 25 feet of any manhole.

A lifeline must be worn at all times by persons working in a manhole.

WAC codes and individual department policies will be followed.

## 1-11 **SEWER, PITS AND TREATMENT PLANTS**

Hydrogen Sulfide is normally present in sewer lines and treatment plants. It is extremely toxic when inhaled and explosive when mixed with air.

Methane Gas formed in digester tanks is highly flammable and explosive and displaces oxygen in confined or poorly ventilated areas.

Carbon Dioxide is formed in large quantities in the sludge digesting process. While not explosive, Carbon Dioxide is an asphyxiating gas and should not be inhaled.

The gases produced by digesting sewage sludge may be explosive, toxic, or suffocating.

Before working in any confined space, the air shall be tested by approved testing devices and retested at periodic intervals to assure that hazardous accumulations of gas do not occur. Forced air ventilation shall be used when necessary to prevent accumulations of hazardous gases.

Personal protective equipment to be used in and around confined spaces shall be as prescribed by department policy required by WAC. All personnel working in or around sewage facilities shall be familiar with the proper use and care of protective equipment.

Sewage normally contains harmful bacteria capable of causing serious disease if precautions are not observed.

All cuts, scratches and breaks in the skin shall be cleaned and treated immediately.

Food and beverages shall not be permitted in areas where they may become contaminated. Laboratory glassware shall never be used to drink from.

Smoking, open flames and spark producing equipment shall be strictly prohibited where flammable or explosive gases are present.

WAC codes and individual department policies will be followed.

## 1-12 **TRAFFIC CONTROL**

The intent of this section is to create a safe work area for those employees with their work locations being in/on any street, road, alley or highway.

Barricading procedures and traffic control shall comply with state laws and any existing City policy.

When it is necessary for an employee or vehicle to work in/on any street, road or highway, proper traffic control will be in place. This control shall consist of coning, coning and flagman, emergency lighting signs, or if needed, all of these methods.

At locations where flagging or coning is established, there will be an employee with State of Washington Traffic Flagman certification.

All flaggers shall wear a reflective orange safety vest and hard hat.

All work areas in/on any street, alley, road or highway shall show proper advance warning to the motoring public that they are approaching a work area. All available safety lighting on city vehicles will be displayed.

All employees shall wear a reflective orange safety vest and hardhat while working in/on any street, road or highway.

## 1-13 **TRANSPORTING OF EQUIPMENT**

Transporting of equipment to the job site shall be accomplished in accordance with all state and local laws governing traffic control.

Mobile equipment operated on streets and highways shall conform to all state and local laws governing motor vehicles. All regulations concerning speeds and load limits shall be strictly observed by personnel operating mobile equipment.

When mobile equipment is hazardous to other vehicles on the road, flag persons, sign or temporary barriers, shall control the traffic.

When equipment is to be towed to the job site, use WSP standard safety chains in addition to towing hooks or tow bars. Operators with D.O.T commercial driver's licenses should be trained in visual inspection procedures for safety chains.

Personnel shall never stand or ride on the tow bar while equipment is being towed

Towing should not be scheduled after dark. When emergency needs required night time towing, fully operating lights shall be placed at the rear of the tow.

When equipment is to be transported by trailer, extreme care shall be taken to prevent equipment from tipping while loading or traveling.

Clearance heights along the proposed route shall be reviewed for low-hanging objects and operators shall keep a close watch to avoid striking low-hanging objects with the equipment.

Equipment shall be secured and lashed to the trailer with the wheels blocked to prevent movement.

All trailers shall be equipped with fully operating stop and directional lights and they shall be checked for operation prior to transporting equipment.

#### 1-14 **TRENCHING AND EXCAVATING**

Determination of the angle of repose and design of the supporting system shall be based on careful evaluation of pertinent factors such as:

- 1) Depth and/or cut/soils classification
- 2) Possible variation in water content of the soil
- 3) Anticipated changes in materials from exposure to sun, air, water or freezing.
- 4) Loading imposed by structures, equipment, overlaying material or stored material.
- 5) Vibration from equipment, blasting, traffic or other sources.

Bridges/walkways with standard railings will be provided when employees or equipment are required to cross over excavations.

Walls or faces of ALL excavations in which employees are exposed to danger from moving ground shall be guarded by a shoring system, sloping of the ground or some other equivalent means in compliance with WAC code.

No person shall be permitted under loads handled by power shovels, derricks or hoists.

All employees shall be protected with appropriate PPE for the protection of head, hands, feet and other body parts.

For other rules and regulations see Washington State Department of Labor and Industries, Division of Industrial Safety and Health Construction Safety Standards – Trenching and Excavating.

#### 1-15 **MECHANIZED EQUIPMENT**

Mechanized equipment in use by the City ranges from grass cutting to heavy construction equipment. The following general rules apply to all types of mechanized equipment.

Only fully trained, properly authorized personnel shall be permitted to operate mechanized equipment. (Trained as per division/department policy)

Operators shall never leave their equipment with the engine running. When leaving the equipment, the engine shall be completely shut down and all blades and lifts lowered to the full “down” position.

No person shall ever attempt to get on or off moving equipment. Unauthorized persons shall not be permitted to ride on equipment at any time.

Each individual job condition shall determine the safe operating speed. The speed shall be the minimum required for safe operation and to minimize dust. When excessive dust or glare is present, operators shall wear protective goggles.

Particular care shall be exercised in starting, turning and stopping of equipment. Operators shall exercise maximum caution to avoid contacting electrical lines with equipment.

Servicing of equipment shall not be performed while the equipment is running or in operation.

Fuel for equipment shall be kept in safety cans plainly marked “gasoline” and the fuel shall be kept isolated from all possible sources of ignition. Servicing shall not be attempted until the engine has cooled.

Maintenance personnel shall only perform maintenance or adjustments of equipment. When performing maintenance, the equipment shall be completely shut down with all lifts or blades lowered to the full “down” position.

## 1-16 **MECHANICAL HANDLING EQUIPMENT**

Mechanical materials-handling equipment such as hand trucks and forklifts shall be used when loads are too heavy or bulky to be carried efficiently or safely by hand.

Hand trucks shall be pushed rather than pulled. Truck handles that expose hands to possible injury shall be equipped with knuckle guards.

On handling equipment, the load center of gravity shall be kept low by placing the heavier objects on the bottom and lighter objects at the top.

Side stakes, straps or lashing materials shall be used on high loads where there is a possibility of injury.

Servicing of equipment shall never be performed while the equipment is in operation. Maintenance shall be performed by only qualified maintenance personnel and checked for performance after repair.

Vehicles with aerial equipment shall not be moved from one working location to another with the equipment in the raised position.

Drivers of aerial equipment trucks shall be constantly alert to the fact that the vehicle has exposed equipment above the truck and allow for necessary clearance.

The specified safe loading capacity shall not be exceeded. The manufacturers' suggest safe load requirements shall be observed for all loads to be lifted.

All controls shall be checked daily before operation to assure that they operate freely and properly.

Upper and lower controls are required for extensible and articulating boom platforms that are primarily designed as personnel carriers. Both controls must be operable and the lower control must be able to override the upper control.

No part of lifting device shall be operated within ten feet of electrical lines except when the lines have been de-energized and visibly grounded at the point of work, or where insulating barriers have been erected to prevent contact with the lines. The only exemption from this rule will be when the work is performed from a device insulated for the work and is performed by either telecommunications employees, line-clearance tree trimming employees or electric utility employees who have been trained in working around exposed electrical lines.

Belting off to an adjacent pole, structure or equipment while working from an aerial lift shall not be permitted.

Personnel shall never be lifted off the ground without being secured to the equipment by an approved body belt and lanyards.

An aerial lift truck may not be moved when the boom is elevated in a working position with men in the basket, except where the equipment is specifically designed for such an operation.

## 1-17 **COMPRESSED AIR AND GAS SAFETY**

For general shop and field use, compressed air shall be adjusted for not more than 30 PSI of pressure. For equipment operation requiring higher pressures, only the minimum pressure required to operate the equipment shall be used.

Do not use compressed air to clean dirt or debris from equipment. Do not direct compressed air from hoses/nozzles towards persons. Compressed air shall never be used to clean workbenches or other surfaces.

Compressed gas cylinders shall only be stored in designated areas away from external heat. The storage area should be away from traffic to minimize possible danger from damage.

All cylinders should be stored upright in racks and securely lashed to prevent falling. Adapter covers shall remain in place until removed for use.

Oxygen cylinders in storage shall be separated from fuel/gas cylinders and combustible materials by a minimum distance of 20 feet or by a noncombustible barrier at least five feet high.

Cylinders shall never be dropped or treated roughly. Any damaged cylinders, suspected or obvious, shall be reported immediately.

When moving cylinders, adapter covers shall be in place to protect valves. In moving cylinders, valves or caps shall not be used as hand holds.

For raising or lowering, use a suitable sling, boat, cradle or platform. Electric magnets shall not raise cylinders.

When transporting cylinders by hand truck, or truck, the cylinders shall be securely lashed to prevent falling.

#### 1-18 **COMPRESSED AIR TOOLS**

In compressed air tools, air is supplied under high pressure. Only the best quality air hoses, equipped with secure couplings, shall be used.

Air supply hoses shall be protected from damage from vehicles or materials at all times. When used across walks or roadways, hoses shall be enclosed in channel ways.

Operators shall turn the air pressure off at the inlet control valve before changing or connecting compressed air tools.

Safety chains to prevent hose whipping in the event couplings become disconnected or break shall connect pressure hoses.

Compressed air tools shall never be pointed at other personnel.

Always wear personal protective equipment when using.

#### 1-19 **POWER SAWS/CHAIN SAWS**

Blade guards shall be kept in good condition and not removed or blocked by operating personnel.

Blades shall be frequently inspected to detect cracks or other defects. Defective blades shall not be used. If they cannot be restored by repair or sharpening, they must be discarded.

When selecting blades, use the correct blade for the job. Substitution of blades that are not right for the job is strictly prohibited.

Saws shall not be jammed or crowded into the work surface. Green or wet material shall be cut slowly and with extra caution.

When a portable saw is adaptable to bench top use, it shall be securely clamped down before using.

When sing table type or bench saws for ripping short stock, the hands shall not be used for pushing the stock. A pusher stick must be used.

When changing blades, disconnect the saw from the power source to prevent accidental restarting.

Approved personal protective equipment shall be used at all times when operating saws. Ballistic nylon chaps and other appropriate personal protection equipment shall be used when operating chain saws.

## 1-20 **PAINTING**

Painting operations produce highly flammable mists and vapors that are easily ignited. For maximum safety, painting operations should be isolated from all other activities. When isolation is impractical fire resistant walls shall separate painting operations.

Paint spray booths shall be constructed and maintained in accordance with the State Safety Code or WAC. Paint booths shall be kept clean and equipment stored in an orderly manner. Walls and floors of paint booths may be protected with papers to prevent accumulations of paint deposits. The paper shall be removed and destroyed when contaminated.

Paints, paint thinner and solvents shall not be stored in paint booths. All flammable materials shall be stored in approved fire resistant cabinets. Clothing that is saturated with painting materials shall be worn only during painting operations and then removed and stored in well-ventilated metal cabinets.

Forced-air ventilating shall be provided in all spray booths where painting is being accomplished. When forced-air ventilation is impracticable, such as for touch-up painting, operating personnel shall wear suitable respirators.

All sources of ignition shall be removed from painting operations. Electrical equipment and fixtures used shall be explosion proof and effectively grounded. Mist and vapors produced by painting may be violently exploded by accidental ignition.

Paints and solvents may contain toxic substances such as lead or benzyl that are harmful if inhaled or ingested. Eating and drinking shall be prohibited around painting areas.

Rags and other waste materials saturated with paint or solvents shall be disposed of in covered metal cans or approved safety cans and emptied daily.

WAC and departmental policies to be followed and personal protective equipment used for all listed above.

### **Chemical spraying**

Each City department under the guidelines set by the WAC will formulate chemical spraying programs, where applicable, individually.

All employees of each particular department will follow their department's chemical spraying program.

## 1-23 **HAZARDOUS COMMUNICATION**

### **Purpose**

The purpose of the Hazardous Communication Program is to ensure that the hazards of all chemicals imported or produced by chemical manufacturers or importers are evaluated and that information concerning their hazards is transmitted to affected employers and employees before they use the products.

### **Procedure**

Inventory lists – Know hazardous chemicals in your workplace that are a potential health or physical hazard. Make an inventory list of these chemicals. This list must be a part of your written program.

MSDS – Make sure there is a Material Safety Data Sheet (MSDS) for each chemical and that the inventory list and labeling system reference the corresponding MSDS for each chemical.

Labeling system – Each container entering the workplace must be properly labeled with the identity of the product, the hazardous warning and the name and address of the manufacturer.

Information and Training – Determine appropriate ways in which to train and inform employees on the specific chemicals in your workplace and their hazards.

Written Program – Develop, implement and maintain a comprehensive written hazard communication program at the workplace that includes provisions for container labeling, material safety data sheets and employee training.

Employees must be made aware of where hazardous chemicals are used in their work areas. They must be informed of the requirements of the Hazard

Communication Standard, availability and location of the written program, the list of hazardous chemicals and material safety data sheets.

The code specifically requires employers to train employees in the protective practices implemented in their work areas, the labeling system used, how to obtain and use MSDSs, physical and health hazards of the chemicals and recognition, avoidance and prevention of accidental entrance of hazardous chemicals into the work environment.

## 1-24 **FALL PROTECTION/RESCUE**

### **Fall restraint**

Guardrails – scaffolding or other work platforms with standard guardrails

Safety belts/harnesses – with lanyards attached to secure anchorage points.

Refer to WAC for application

### **Fall arrest**

Full body harnesses – with lanyards properly secured to anchorage points or to lifelines

Refer to WAC for applications.

### **Fall hazards**

List of those in work areas ten feet or more above ground, other work surface or water.

See WAC for specific safety codes.

## **VEHICLE PRE-TRIP INSPECTION**

### 1-25 **TYPES OF INSPECTION**

#### **Pre-trip inspection**

A pre-trip inspection is necessary before each trip to find problems that could cause a crash or breakdown. The pre-trip is intended to give the driver an indication that problems may exist, or may be developing. These problems may not reflect the “out of service” standard for each item. Any item not meeting the listed specifications should be thoroughly checked for safe operation.

#### **ENGINE COMPARTMENT**

Check engine oil level and condition.

Check transmission oil level and condition (automatics).  
Check coolant level and condition in radiator and overflow tank (when cold).  
Check power steering fluid.  
Check battery cable connections for corrosion, and hold down.  
Check washer fluid level  
Inspect all belts and hoses, including power steering hoses for wear or damage.  
Before closing engine compartment give one last overall visual inspection for any leaks, or irregularities.

## **EXTERIOR OF VEHICLE**

Check operation of all lights.  
Check for any body damage.  
On dump trucks make sure tailgate is securely latched.  
On air brake equipped vehicles listen for any air leaks.  
Inspect condition of hydraulic hoses where applicable.  
Check wiper blades and condition of all glass.  
Check tires for wear and proper inflation.  
Check wheels for cracks.  
Look underneath vehicle for any fluid leaks

## **INSIDE CAB**

Check operation of all controls.  
Check operation of all gauges and warning devices.  
Check horn.  
Make sure all safety equipment is on board.  
Check operation of seat belts.  
Make sure all loose equipment is properly stowed.  
Check adjustment and condition of all mirrors.

### **During a trip**

Watch gauges for signs of trouble.  
Use your senses to check for problems (look, listen, smell, feel)  
Check critical times when you stop:

- Tires, wheels, and rims
- Brakes.
- Lights.
- Brake and electrical connections to trailer.
- Trailer coupling devices.
- Cargo securement devices.

### **Post-trip inspection and report**

An after-trip inspection is necessary at the end of the trip, day, or tour of duty on each vehicle you operated. It may include filling out a **vehicle condition report** listing any problems you find. The inspection report helps the vehicle owner know when to fix something.

For further in depth detail of the vehicle pre-trip inspection refer to the State of Washington Department of Licensing Commercial Drivers Guide.

## **SECTION 2 SAFETY, OPERATIONS, AND PROCEDURES**

### **2-01 SNOW AND ICE CONTROL**

#### **Introduction**

Save lives

Keep traffic moving

Prevent property damage

Save Money – (Snow and Ice Control is the most expensive maintenance activity)

Takes precedence over all non-emergency work

#### **PREPERATION AND GENERAL INFORMATION**

##### **Routes and priorities**

Maintenance Accountability Process Priority System

The superintendents and supervisors will determine the level of priority using traffic levels and weather history. Snow and ice control measurement data will be collected to assist in adjusting these priorities.

Designated operators will complete the MAP Snow and Ice Data Collection Form. These samples will be documented using the Snow and Ice Performance Measurements Field Data Collection Procedures.

The routes and their priorities should be briefed to the operators before the snow season and each day before beginning operations.

##### **Drive through route before winter season**

Check: Spots where ice will be a problem

Hills

Curves

Intersections

Super elevations

##### **Areas of responsibility**

Assigned route (Gang-up, help others clear priorities)

**Not responsible for:**

Private approaches

**Snow meetings**

Pre-Season crew meeting

City and County road departments

Fire and Police Department

**Closures**

“By any maintenance employee in an emergency.”

Accidents

Treacherous conditions

Slides

Use proper signs and devices

Set up detours if necessary

Notify supervisor

Goes up the chain of command

Fire and Police-if over an hour

City maintenance engineer if over four hours

New Media informed as time permits

Don't ever leave a closure unless relieved or traffic control is in place

**Emergency assistance**

Limited to safeguarding life and property

Get help on the radio

When the road is under control and no other assistance is available

Stranded motorist makes own hookup and disconnect

No towing unless vehicle blocks traveled way

No compensation accepted

Only employees ride in city owned vehicles (except in an emergency situation)

**Abandoned vehicles**

Request for removal with city police

Can be removed immediately if hazard

**PROCEDURE**

**Before leaving the shop:**

- Check with the supervisor as to the unit (truck/equipment) you will be operating and in what area.

- Make sure you are dressed for foul weather.
- Check all items on the VCR (vehicle condition report) for the equipment being used
- CHECK FUEL
- Check plow, spreader, chains, shovel, hoses, spill plates, spreader settings, flashlight and emergency markers. Danger! Do not pull on gate with hands! If the gate is stuck, use a tool.
- DO NOT overload trucks with sand material.
- Be mindful of fuel level on all equipment being used to carry out tasks.
- Check spreader operation in the area of the sand pile.
- Call for radio check.

### **Sanding/plowing operations:**

- Start assigned section with Main Streets.
- Emergency situations (Fire, Ambulance, Life Threatening) will be handled IMMEDIATELY. Advise your supervisor immediately of any such emergencies or deviations from your assigned section.
- Sand hills, curves, intersections and controlled intersections.
- Use sand with “good judgment” during all snow plowing activity. This means to be as conservative as possible when sanding to improve driving conditions.
- Be mindful of “custom plowing” in your areas and maintain through the storm.
- Periodically check spreader and sand pattern.
- Maintain speeds that are safe for the conditions (average speed 15 to 18 mph).
- The term “passable” means that the roadway in both directions has been sanded or plowed and maintained so that driving is possible.
- If conditions are icy and chains are necessary, contact your supervisor and advise him that you will be returning to the shop and will need assistance to install them.
- After main streets are determined passable, then begin the problem area and secondary streets.
- After problem areas and secondary streets are determined passable, begin the residential streets.
- After residential streets are determined passable, contact your supervisor for further instructions.
- The term “widen-out” means to wide the plowed lanes by laying the wind-rowed snow to approximately one foot away from the gutter flow line.
- DO NOT plow onto sidewalks.
- KEEP PLOWS AND EQUIPMENT OFF OF PRIVATE PROPERTY!
- Make sure all wide intersections are cleaned thoroughly; push all snow to within one foot of curb and make sure intersections have rounded corner.
- In cul-de-sacs, make one pass with the truck as wide as possible or determine a location that the snow can be pushed so that it will not cause a problem.
- ALWAYS USE EXTREME CAUTION WHEN BACKING UP (ALWAYS USE A GROUNDS GUIDE). BACK UP ONLY WHEN NECESSARY.

- When making the last pass, position the plow so that the snow is wind-rowed approximately one foot from the face of the curb or flow line. If plow damage to curbs is incurred, document the information and give it to your supervisor.
- After returning to base, clean all sand, snow and ice off trucks before parking them in their spots.
- Check with your supervisor before you leave and report any “incidents” or “unusual occurrences” that happened during your shift.
- Sanding areas are primary assignments. Vehicles and manpower may be switched as needed.

### **Sand spills**

- If a small amount of sand spills, shovel it back into the truck.
- If larger amounts are spilled, call the supervisor for instructions.
- Sand spilled at the shop facility will be collected following completion of snow plowing operations. A designated employee will use front end-loader to scrape loading area and push the material back into its stockpile

### **Snow plow accident procedure:**

If witness to an accident, notify Police Dispatch of the following:

- Location – street address and cross street if possible.
- Indicate weather emergency medical treatment is needed.
- Request Police or Fire Department personnel if needed.

If involved in an accident:

- Contact your supervisor and Police Dispatch.
- Stay with the vehicle at the scene of the accident and wait for assistance.
- Place warning marker as needed for safety purposes, and to warn other drivers.
- DO NOT discuss the accident with other involved.
- Do not use your vehicle to pull out motorists that are stuck or to jump-start another vehicle. If you witness a vehicle that is obstructing traffic or causing an unsafe condition contact Police Dispatch and advise of location and description of vehicle.

### **Reminders:**

- KEEP PLOWS AND EQUIPMENT OFF OF PRIVATE PROPERTY.
- Location of twisted or downed stop signs, broken and hanging tree branches, leaking fire hydrants or unusual amounts of water, and damage to any part of the City infrastructure should be reported to the supervisor for documentation, and follow-up.
- If during your snow and ice control operations you witness an individual removing snow from private property into the street contact the supervisor immediately with the location and description of the vehicle or individual.
- Make sure turning maneuvers are executed slowly.

- Use extra caution during nighttime driving.
- Use the two-way phone only for emergencies and job-related communication.
- After you have finished your shift make sure the vehicle is fueled and interior of the vehicle cab is clean of all debris.
- If chains will improve the control and operation of your vehicle, use them.

**Equipment cleanup:**

- If storm has ended and there is no snow forecast for the next 48 hours empty sand back into the stockpile. Wash down truck, sander and plow, clean interior and park in the garage.
- If snow is forecasted within the next 48 hour period leave truck loaded with material. Wash down truck, sander and plow. Clean and park in garage.
- Inspect all equipment during cleanup for wear or damage and follow up with the appropriate action.

2-02 **STEET SWEEPING PROCEDURES**

**Conditions:**

Dry with temperatures of 35 degrees and rising with a minimum of 90% of the street pavement exposed. Starting times for the sweeper operations are Monday, Wednesday, Thursday 8:00a.m.-5:00p.m. (residential streets), Tuesday and Friday 4:00a.m.-12:00p.m. (downtown & commercial areas).

**Cold weather months (November through April)**

Streets are cleaned the same priority they are sanded.

Primary streets – routinely cleaned as soon as possible after every snowstorm, weather permitting.

Problem areas and secondary streets – routinely cleaned but only after all above streets are completed; weather usually requires intermittent scheduling.

Residential streets – sections are cleaned on an intermittent rotation basis only after a and b above streets are cleaned. The rotation of the sections reduces sand buildup over a number of storms.

**Fall months (September through November)**

Main priorities are leaf routes, downtown & commercial areas.

Sweeping leaves will be performed as the season dictates and weather permits. See map of leaf routes.

During the leaf season the downtown area sidewalks will have the leaves blown out to the curbside twice a month.

Residential streets are swept only after a and b are completed except in the case of emergency.

### **Spring and Summer months (April through September)**

Main priorities are residential, downtown, and commercial areas.

During the spring and summer months downtown and commercial areas will continue to be swept on Tuesday and Friday.

All residential streets will be swept during this period on Monday, Wednesday, and Thursday.

## **SEWER JET**

### **Safety**

- Never raise collector body without unit being on firm and level ground.
- Never raise collector body or boom near power lines, overhead obstruction, or in strong winds.
- Verify adequate bridge and overpass clearances when driving.
- Never move the unit with the collector body or boom raised.
- Do not attempt to service the unit with the collector body raised unless sufficiently propped.
- Do not attempt to service the unit with the tailgate open unless sufficiently propped.
- Do not open or close the tailgate, or bag house door, raise or lower the body, or engage the vacuum pump unless certain the area is clear of people or obstructions.
- Never operate vacuum pump without a safety relief between the unit and the end of the suction inlet.
- Do not enter body if hazardous materials are suspected inside body. Take unit to a certified tank cleaning facility or cleaning.
- Walkways and steps should be checked monthly to insure a proper non-slip surface. Replace or repair immediately as required.
- Vacuum pump, transfer case, vacuum pump exhaust silencer and engine exhaust pipes can be hot during or just after equipment usage.

- Under certain operating conditions, the noise level of this unit could be dangerous to your health. It is recommended that appropriate ear protection be worn at all times.
- Ground level personnel must be present whenever climbing onto unit to protect against inadvertent operation.
- Four bolts for maintenance purposes can remove drive shaft guard between the vacuum pump and transfer case. This guard and all bolts must be replaced prior to operating the machine.
- Sufficient light is required to ensure safe operation of the unit.

## **PRE-TRIP INSPECTION**

A pre-trip inspection is necessary before each trip to find problems that could cause a crash or breakdown. The pre-trip is intended to give the driver an indication that problems may exist, or may be developing. These problems may not reflect the “out of service” standard for each item. Any item not meeting the listed specifications should be thoroughly checked for safe operation.

- Make sure that water tanks are full before use.
- Make sure that tailgate is latched and secure.
- See that all hoses are reeled in and in place.
- Retract boom and set in place.
- In addition for further detail of the vehicle pre-trip inspection refer to the State of Washington Department of Licensing Commercial Drivers Guide.

## **OPERATING PROCEDURES**

### **Boom operation**

Start truck engine and allow idling. Make sure parking brake is set, transmission is in neutral and rear wheel chocks positioned.

**WARNING: FAILURE TO DO ANY OF THE ABOVE COULD RESULT IN TRUCK ROLLING FORWARD OR BACKWARD RESULTING IN POTENTIAL OR PROPERTY DAMAGE.**

The boom is operated off the main crankshaft driven hydraulics. The hydraulic system is always engaged when the truck engine is running unless your unit is equipped with the optional hydraulic pump clutch. Inside truck cab, locate electric switch labeled clutch pump to engage hydraulic pump.

At front control panel, locate four-way joystick boom control. Make sure boom hose transport lock is released first before swinging boom. By moving the joystick one of four directions indicated, boom will go up, down, left, or right. Boom will swing 105 degrees each way from centerline of truck for a total of 210 degrees. A mechanical stop will limit the maximum swing.

If your unit is equipped with a telescoping boom, locate the boom extend/retract toggle switch on the front control panel. By operating as shown, the boom will extend and retract as desired.

**WARNING: WHEN OPERATING THE BOOM, OBSERVE OVERHEAD ELECTRICAL WIRES OR OBSTRUCTIONS, WHICH COULD RESULT IN PERSONAL INJURY OR PROPERTY DAMAGE.**

If a vacuum pump operation is to be used, connect required intake tubes onto intake hose and lower into manhole. Make sure gaskets are positioned on couplings. Use shortest possible length of tubing to ensure most direct route.

## **VACUUM/WATER PUMP OPERATION**

Start engine and allow idling. Keep transmission in neutral.

The Allison Transmission will be equipped with either a mode button on the transmission selector control panel or, a PTO enable switch located in the truck instrumental panel. Turn it to the “ON” position

Position sewer nozzle valve #1 and return to tank valve #2 to correct position.

At the front operator’s control panel, turn water and/or vacuum pump on by moving hot shift PTO labeled toggle switch(s) to “ON” position. Appropriate indicator light(s) next to toggle switch will illuminate when switch is in the “ON” position.

**CAUTION: NEVER TURN ON VACUUM AND/OR WATER PUMP SWITCH UNLESS TRUCK ENGINE IS BELOW 950 RPM. FAILURE TO COMPLY WITH THIS COULD CAUSE PREMATURE FAILURE OF PTO’s, DRIVETRAIN AND/OR TRANSMISSION.**

After engaging the PTO(s) with transmission in neutral, increase engine speed at operator’s control panel for desired operation.

If vacuuming dry catch basins or any other dusty material, either wet down the material with the handgun or use the optional wet ring to inject water into the vacuum line.

Once cleaning operation is complete, reverse above steps.

**Note:** PTO(s) can be disengaged at any speed. Return engine speed to idle, or under 950 RPM to re-engage PTO(s)

**CAUTION: DO NOT DISENGAGE VACUUM PUMP PTO WHEN UNDER FULL VACUUM. THIS COULD CAUSE VACUUM PUMP TO RUN IN REVERSE CAUSING UNNECESSARY DAMAGE OR FAILURE OF VACUUM PUMP. RAISE DEBRIS BODY TO BREAK VACUUM, AND THEN DISENGAGE VACUUM PUMP PTO.**

## **SEWER CLEANING OPERATION**

Position truck over downstream manhole so sewer hose is directly over manhole. If manhole cannot be reached, an upper manhole hose guide must be used to protect the hose from damage. Transmission must be put in neutral, allow engine to idle, set truck brakes and position wheel chocks.

Put transmission into PTO mode.

Unlock boom from transport position from front bumper

Open quarter turn valve in suction line to water pump. Make sure water tank has adequate supply of water.

At front control panel, locate reel directional control lever and reel speed control knob. Turn speed control knob clockwise until it stops. Then turn counterclockwise approximately 1/8 turn. Pull reel control valve handle out so as to payout hose into manhole. Allow enough hose to pay off so hose is resting on the road.

Position lower hose guide (tiger tail) over sewer hose.

Select the correct nozzle for the unit's water pump, attach a minimum ten feet leader hose the sewer hose and the nozzle extension pipe between the leader hose and the nozzle. The nozzle extension will prevent the nozzle from turning around in the pipe or entering a house lateral.

Slowly lower the sewer hose and tiger tail into manhole. Allow about three to five extra feet of sewer hose to enter manhole. In feeding the hose into a manhole at the start of the operation, care must be exercised in order to avoid hose tangles and kinks.

**WARNING: COMING INTO CLOSE CONTACT WITH THE HOSE SHOULD ONLY BE DONE WITH THE WATER PUMP “OFF” AND NOT WITH THE HOSE PRESSURIZED AS INJURY COULD RESULT FROM HOSE BURSTS OR COUPLING FAILURE.**

Orient nozzle in direction of sewer line to be cleaned.

On rear mounted reel, make sure sewer hose ball valve located by water pump is in the “Open” position.

With engine at idle, turn “ON” water pump toggle switch on front of the control panel.

Increase engine speed to start nozzle up the line. Allow three to five feet of hose to gravel up line. Turn off water pump toggle switch. Position lower hose guide (tiger tail). Failure to use a hose guide may result in the hose rubbing against the pipe causing severe wear or cutting. Make sure the end of the hose guide is into the pipe to be cleaned and then tie off the rope to the truck bumper so the tigertail won't go further into the pipe.

**DANGER: NEVER PRESSURIZE SEWER HOSE WHEN HOSE IS LAYING ON STREET OR NOT PROPERLY ORIENTATED IN SEWER AS NOZZLE WILL CAUSE HOSE TO UNCONTROLLABLY WHIP AND COULD CAUSE PERSONAL INJURY OR DEATH.**

If you want to vacuum at the same time as jet, add enough vacuum pipe to the boom hose so boom is in lowest position possible but reaches bottom of sewer lateral.

With engine at idle, turn water pump toggle switch to “ON” position.

Increase engine speed until desired water pressure shows on gauge. Don not exceed 2000 PSI. Excessive pressure could cause equipment failure or personal injury.

Pull reel control lever to pay out hose. Reel speed is controlled by knob on control valve. Water pressure is controlled by engine speed. When paying out hose, operator must observe the hose and the reel for any unusual conditions, which could cause tangling of hose in the manhole or on the reel.

In normal cleaning operations, you would clean a section of pipe to the next manhole. If cleaning line is known to be very dirty, it is best to clean short sections at a time. When the nozzle is traveling away from the truck, operate the unit at the slowest engine speed possible to conserve water as you are moving the nozzle into a position to clean a back flush material. When first learning to operate the unit, it is better to keep the reel speed slow but as experience is gained, you will learn when the reel can be operated at a faster speed to help conserve water.

When paying out the hose, there will be times when you will hit an obstruction or blockage and the nozzle will stop. When this happens stop the hose reel, increase the engine speed to the maximum allowable or until the pressure reaches two thousand (2000) PSI. Retrieve a few feet of hose and then pay out the hose again. Continue this a couple times and in most instances you will penetrate the blockage. If you don't have a nozzle with a forward jet on, you may have to change nozzles as the forward jet blasts into the blockage to help free the obstruction.

The operator must observe the movement of the hose and the operation of the reel when the nozzle is traveling away from the unit.

This means on a behind the cab unit regardless of where the manhole is located, the operator should swing the controls to the curbside where he can observe the reel. Should the hose develop loose wraps from either hitting an obstruction or the hose paying out too fast, the operator must reduce the speed of the reel or stop the reel and/or increase the water pressure so the nozzle travels faster. It is essential that the operator react promptly so the hose does not tangle.

It is recommended that until an operator gains some operational experience, he pay out hose at a slow rate and only increase this rate when he feels comfortable with the operation.

If loose wraps develop, reverse the direction of the reel so as to rewind the hose onto the reel until the loose wraps are gone. Then proceed with paying the hose out at a slow rate.

On either the front mount or behind the cab models, at times the hose may pinch against itself so severely that as the reel is rotating to pay out hose, the hose may actually want to change direction on the reel.

The operator will readily see this as he observes the reel. To correct this condition, the operator should stop the reel rotation and turn the water pump momentarily off. If the pinch still exist, the operator should lower the engine speed to an idle, make sure the water is off, and attempt to pull on the hose so as to remove the pinch, then proceed as normal.

**CARE MUST BE EXERCISED IN HANDLING THE HOSE TO OBSERVE FOR PINS, RAZOR BLADES OR OTHER SHARP OBJECTS. GLOVES MUST BE WORN.**

Once the nozzle has reached the next manhole or has traveled as far as the operator wants it to go, it is time to retrieve it. Make sure the lower hose guide is properly positioned. Since the actual cleaning and back flushing of material occurs when retrieving the hose, the reel speed should be reduced as required, normally one to three on the speed control knob. Water pressure should be at a pressure sufficient to clean the line. Too much pressure could force water into a house lateral if roof vents are plugged or nonexistent.

To retrieve hose, push reel control valve in. Observation of the rear reel is not necessary when retrieving hose. On front mounted reels a manually operated level wind is provided. The operator should observe if excess water is accumulating at the bottom of the manhole.

This may require stopping the reel and shutting the water system off long enough for the excess water to flow down the line.

The operator should also be looking for signs of debris being back flushed to the manhole to lower the vacuum tube to where he can pick up the material.

Material will normally be seen in the manhole when the nozzle is twenty to thirty feet from the manhole. Once the ten feet leader hose is visible at the bottom of the manhole, the operator should reverse the reel control lever and run the nozzle up the line again as described earlier.

**WARNING: NEVER REMOVE THE SEWER NOZZLE FROM THE LATERAL WITH THE SYSTEM STILL ON. ALWAYS USE A LEADER HOSE SO THE OPERATOR CAN TELL WHEN THE NOZZLE IS APPROACHING THE MANHOLE. FAILURE TO COMPLY WITH THIS COULD CAUSE PERSONAL INJURY.**

Repeat this procedure until the line is clean. Check the water supply to ensure the hose can be retrieved under pressure. Never operate water pump for prolonged periods of time without water. Refer to water pump instructions.

When using the vacuum system to remove back flushed debris, it normally is best to only vacuum when material is actually seen in the bottom of the manhole. Exceptions to this could occur if cleaning an extremely greasy line where chunks of grease are floating down or if water is needed to supply the optional recycling system. Operator experience will best determine this.

**WARNING: WITH COLLECTOR BODY FULL OF DEBRIS AND WATER TANKS FULL, IT IS POSSIBLE TO EXCEED THE GVWR OF THE CHASSIS REAR SUSPENSION. ANY OVERLOAD CONDITION COULD CAUSE SUSPENSION FAILURE. THE OPERATOR SHOULD DEWATER THE DEBRIS BODY BEFORE GOING TO DUMP THE MATERIAL. THE WATER TANKS SHOULD BE NEAR EMPTY BEFORE TRANSPORTING. THE OPTIONAL BODY OVERLOAD ALARM, DESCRIBES ELSEWHERE IN THIS MANUAL, WILL NOTIFY THE OPERATOR WHEN THE GVWR OF THE CHASSIS REAR SUSPENSION IS REACHED.**

When the line is clean or the water supply is gone, shut off the vacuum and/or water pump by operating the toggle switch to the "OFF" position. Reduce engine speed to an idle.

Close the sewer nozzle ball valve at the front control station if a front reel or near the pump if a behind the cab reel.

Untie the lower hose guide rope and retrieve the tiger tail and properly store. Slowly rotate the reel to bring the hose up out of the manhole. Be alert to the possibility of spray coming out of the rear of the nozzle.

On rear mounted reel model, retrieve hose until the end is inside the smooth bore hose. Lock the operator control panel in place before moving the truck.

Make sure all items are properly stored and the manhole cover is properly positioned.

## **Handgun Operation**

With water system off and no pressure in the line, carefully couple handgun hose to water connection. One connection is at front of unit with second connection near water pump.

Make sure sewer hose ball valve described earlier is closed. On standard system, open return to tank ball valve located near water pump. On units equipped with 800 PSI handgun regulator, open regulator ball valve located near regulator.

Engage water system.

On standard system, closing return to tank valve increases water pressure. Never fully close valve as water pressure will build to two thousand PSI and dump over pressure relief resulting in excessive power consumption. Normal operation utilizes four hundred to eight hundred PSI. On standard system a 800 PSI regulated system increasing engine RPM also increases pressure at handgun.

**WHEN PRESSURES ARE INCREASED, A STRONGER REACTIVE FORCE IS DEVELOPED BY THE HANDGUN, WHICH REQUIRES THE OPERATOR TO COUNTERACT. THIS INVOLVES FIRMLY PLANTING YOUR FEET AND SECURELY HOLDING THE GUN WITH BOTH HANDS. NEVER DIRECT WATER STREAM AT HUMANS AS INJURY COULD RESULT.**

Upon completion, reverse above procedures and store handgun.

## **PAYLOAD DUMPING OPERATION**

Carefully position truck at dumpsite on level and stable ground, engage parking brake put transmission in neutral and position rear wheel chocks.

Engage hydraulic system. Control valves for dumping unit are located on driver's side behind cab.

Raise tailgate if unit is equipped with hydraulic tailgate lift. Raise body or operate ejector to dump material.

**Warning:** Do not go under debris body or behind closed tailgate as personal injury could occur.

If equipped with hydraulic latches, operate tailgate latch hydraulic control valve handle until latch mechanism is fully unlatched, raise rear door.

If unit is equipped with body flusher, fully open ball valve located between water pump and front of body. Close return to tank ball valve one or 800 PSI regulator valve. Close sewer hose ball valve #2. Engage water pump. Allow water to flow long enough to clean inside of body.

Clean tailgate seal surfaces as required. This may require use of handgun.

Reverse above procedures when completed. When latching hydraulic tailgate, hold in tailgate lower control lever while operating latch lever. This ensures that latch mechanism properly engages. With manual rear door locks, lower body, pull unit out of debris and secure locks.

Only raise body on level firm areas to avoid tipping unit over. Failure to comply could result in personal injury or death.

## **STREET SWEEPER**

### **Safety**

Do not operate or service this unit until you have read and understand all operation and maintenance literature supplied with this equipment.

Keep clear of rotating parts and potential pinch points.

Be sure all guards and safety devices are in place and functional.

Keep body and limbs away from suction inlets.

Do not attempt to service the unit with the tailgate open unless sufficiently propped.

Walkways and steps should be checked monthly to insure a proper non-slip surface. Replace or repair immediately as required

Sufficient light is required to ensure safe operation of the unit.

### **PRE-TRIP INSPECTION**

- Check auxiliary engine oil and coolant
- Check for seal leaks
- Check warning and work lights
- Inspect pickup head

- Check gutter broom
- Adjust mirrors
- Fill fuel tank
- Fill water system

In addition for further information refer to the State of Washington Department of Licensing Commercial Drivers Guide.

## **OPERATING PROCEDURES**

### **Sweeper start up procedures**

- Start rear engine (must be in idle)
- Turn on warning lights
- Turn on water system
- Lower pickup head
- Pull sweeper forward to tuck pickup head curtains
- Throttle up auxiliary engine RPM to desired levels
- Lower gutter broom(s)
- Begin sweeping
- **DO NOT BACK UP WITH PICKUP HEAD DOWN.** Throttle down, pick up head then back up. (Optional Reverse Pickup Chains allow you to back up with the head down.)

### **Leaf pressure bleeder procedures**

- Closed for heavy debris such as sand, gravel, dirt; etc.
- Open 100% when sweeping light debris such as leaves, paper, cups, etc.
- Adjust opening 25% to 75% for mixed debris.

### **Sweeper shut down procedures**

- Lower auxiliary engine RPM
- Raise gutter brooms – (must hold switch in the up position to fully retract gutter broom)
- Raise pickup head – (must hold switch to retract to the travel position)
- Turn off water system
- Turn off warning lights
- Turn off auxiliary engine

## **LOADER BACKHOE**

### **Safety**

Avoid loose fitting clothing, loose or uncovered long hair, jewelry and loose personal articles.

Different jobs will require different protective equipment. Items such as hard hats, protective shoes, heavy gloves, reflector type vests, respirators, face, eye, and/or ear protection can be required. Know and use the equipment that is required before you start the job.

Know the hand signals used on your job.

Check that all doors, guards, and covers are installed correctly or closed.

Foreign material or grease on the steps and handrails can cause an accident. Keep the steps and handrails clean.

Always face the machine and use the handrails and steps when getting on or off. Do not rush.

Remove all loose objects from the operator's area and from the machine. Loose objects can jam controls and cause accidents.

Before you start each day, walk around the machine and check for oil or fluid leaks. Replace all broken or missing parts and do the required lubrication and maintenance as shown in this manual.

Engine exhaust fumes can cause death. If you operate this machine in an enclosed area, use good ventilation to replace the exhaust fumes with fresh air.

Make sure all persons are away from the machine before you start the engine.

Before you start the engine, always fasten the seat belt.

Know the rules, laws, and safety equipment necessary for transporting or driving this machine on a road or highway.

Before you operate at night check that all lamps illuminate.

If your machine has a cab, make sure that all windows are clean and that the windshield wipers work correctly.

Check all controls in a clear area and make sure the machine is operating correctly.

Do not allow other person to ride on the machine. Other person can fall or can cause an accident.

Dust, fog, smoke, etc., can decrease your vision and cause an accident. Stop the machine or decrease the speed until you can see everything around you in the work area.

Contact with high voltage power lines, underground cables, etc., can cause serious injury or death from electrocution.

Before you drive or operate in an area with high voltage lines or cables, tell the power or utility company what you are going to do. You must have the power disconnected or keep a safe working distance from the lines or cables. You must know the safe working distance from the high voltage power equipment and must know any federal state/provincial, or local safety codes or regulations that apply to the job site.

If this machine rolls over, you can be injured or killed. You must make a judgment if weather, road, or earth conditions will permit safe operation on a hill, ramp, or rough ground.

Stay away from hazardous areas such as ditches, overhangs, etc. Walk around the work area before you start and look for hazards.

Be alert and always know the location of all workers in your area. Keep all other persons completely away from your machine. Injury or death can result if you do not follow these instructions.

Keep the loader bucket low when moving around the work area and be careful when you raise the load to dump.

Before you operate the backhoe in an area where your visibility is reduced, such as next to a building, etc., always install a guard rail and warning signs to keep other persons away from your machine.

### **Walk Around Inspection**

- Do the following items each day before you start the engine.
- Check for leaks under the machine.
- Check the tires for damage.
- Check the machine for broken, missing, or loose parts.
- Clean any debris from the machine. Make sure the radiator area is clean.
- Clean or replace any safety or instructional decals that cannot be read.
- Clean the steps, handrails and operators compartment.
- Check the engine oil level.

### **Starting The Engine**

- Make sure the seat is turned around to the loader position.
- Adjust the seat and fasten the seat belt
- Make sure the parking brake is applied, the direction control lever is in neutral, and the engine hand throttle is pushed back to the idle position.
- Turn the key switch to ON and check the engine oil pressure and alternator warning lamps. Both lamps must illuminate.
- Push the foot throttle  $\frac{1}{4}$  down and turn the key switch to the START position to actuate the starter motor. Before the engine starts, check the air cleaner and hydraulic fluid filter warning lamps. Both lamps must illuminate.

- If the engine starts and stops, do not actuate the starter motor again until the starter motor stops turning.
- **Note:** Do not operate the starter motor more than 10 to 15 seconds at one time. Let the starter motor cool for three minutes before you actuate the starter motor again. While the starter motor is engaged, white or black smoke must be seen at the exhaust pipe. If no smoke is seen, check the fuel supply.
- After the engine starts, check the instruments to make sure the gauge indications are correct. Run the engine at 1000 rpm until the coolant temperature is warm.
- Do not run the engine at idle speed for long periods. This can cause a low operating temperature. Low operating temperature can cause acids and deposits in the engine oil. It is recommended that you run the engine at full throttle when operating conditions permit and when safe.

### **Clutch Cutout Button**

Push the clutch cutout button to give maximum power to the loader hydraulics. When you push the clutch cutout button, the transmission is disengaged from the drive wheels. Release the clutch cutout button to engage the transmission power. The machine can roll free when the clutch cutout button is pushed. If required, use the brakes to stop the machine.

### **Standard Bucket Level Indicator**

The bucket level indicator has two pointers on the bucket links. The bucket is level on the ground when the two pointers are opposite each other.

**Caution:** Operating a loader with a full bucket on a hillside can cause the machine to roll over. If possible, avoid turning the machine and always move forward up the hill and back down. Always keep the load low. If you do not follow these instructions, you can be injured or killed.

When you operate the machine, keep the loader bucket as low as possible. This low position gives better balance and permits you to see more clearly. If the bucket is full and you move the machine over ground that is rough or surface that can cause the machine to slide, always operate at a slow speed. If you do not use this procedure, the machine can go out of control and cause a rollover.

### **Lifting With The Loader**

If you lift a load with the loader, be very careful. This machine is not a crane.

**Important:** Make sure that you use rigging material that has the capacity to lift the loads that you will be moving. Always check the rigging material each day for damaged or missing parts.

Always know the location of all workers in your area. Warn them before you start working the machine. Always keep all other persons away from your area. Serious injury or death can result if you do not follow these instructions.

Uncontrolled machine movement can injure. Before you turn the operators seat around to the backhoe operating position, shift the direction control lever and transaxle control to neutral and apply the parking brake.

## **General**

The backhoe will dig more material in less time when a smooth, short dig cycle is used. Keep each dig cycle smooth.

When you force the bucket to dig a load that is too large, you will cause a “hydraulic stall” (dipper control lever pulled back and the bucket is not moving). The main relief valve of the hydraulic system will make a noise when “hydraulic stall” occurs. “Hydraulic stall” will cause cycle times to be longer and will also cause the temperature of the hydraulic oil to increase.

## **Stabilizer Pads**

If you dig next to a building, wall etc., change the position of the stabilizer pads

- Remove a retaining ring from the pin on each stabilizer pad.
- Use a hammer and drift. Remove each pin.
- Put the stabilizer pads in position shown. Install the pins and retaining rings.

**Important:** Always position the stabilizer pads for maximum stability when you are not operating the backhoe next to a wall, building, etc.

**Important:** Be careful when you swing the backhoe completely to the side. In some positions, the backhoe can contact the stabilizers and can cause damage.

## **WARNING:**

Before each period of operation, check the backhoe for correct function of each control. A backhoe that operates correctly can prevent accidents. Make all necessary repairs or adjustments before you operate the backhoe.

Do not dig the ground under the backhoe stabilizers. The machine can fall into the excavation if the bank falls in.

When you operate the backhoe on the side of a hill, (1) make the machine level with the stabilizers and (2) put the earth from the trench on the highest side of the trench. Failure to follow these instructions can cause injury.

Before you operate the backhoe in an area where you visibility is reduced, such as next to a building, etc., always install a guard rail and warning signs to keep other persons away from your machine.

A working backhoe can injure or kill. Before you start, always make sure that all persons are away from the DANGER AREA.

Always know the location of all workers in your area. Warn them before you start working the machine. Always keep all other persons away from your area. Serious injury or death can result if you do not follow these instructions.

## **GRADER**

### **Safety**

Never attempt adjustments while the machine is moving or the engine is running unless otherwise specified.

Support equipment and implements properly when working beneath them. Do not depend on hydraulic cylinders to hold it up. Any implement can fall if a control is moved, or a hydraulic line breaks.

Where there are implement linkages, the clearance in the linkage area will increase or decrease with movement of the implement.

Stay clear of all rotating and moving parts.

Keep objects away from moving fan blades. They will throw or cut any object or tool that falls or is pushed into them.

Do not use a kinked or frayed wire rope cable. Wear gloves when handling the wire rope cable.

Retainer pins, when struck with force, can fly out and injure nearby persons.

Wear protective glasses when striking a retainer pin to avoid injury to your eyes.

Chips or other debris can fly off objects when struck. Make sure no one can be injured by flying debris before striking any object.

### **Walk Around Inspection**

**Warning:** Hot oil and components can cause personal injury. Do not allow hot oil or components to contact skin.

At operating temperature, the engine coolant is hot and under pressure.

Steam can cause personal injury.

Check the coolant level only after the engine has been stopped and the fill cap is cool enough to touch with your bare hand.

Remove the fill cap slowly to relieve pressure.

Cooling system conditioner contains alkali. Avoid contact with the skin and eyes to prevent personal injury.

Inspect tires for cuts, gouges and proper inflation pressure. Check valve stems and caps for damage.

Inspect circle drive for leaks. Stop any leaks.

Inspect blade and end bits for wear, damage, loose or missing parts. Make repairs as necessary.

Inspect blade linkage for damage, loose or missing bolts.

Inspect cooling system for leaks, worn hoses and trash buildup. Stop any leaks, replace worn hoses and remove all trash.

Inspect condition and cleanliness of steps and handholds. Repair or clean steps and handholds if necessary.

Inspect operator's compartment for cleanliness, loose items or broken gauges. Clean operator's compartment as necessary.

Inspect the pre-cleaner screen. Remove any dirt and debris.

Inspect hydraulic system for leaks, worn hoses or damaged lines. Stop any leaks, replace worn hoses or damaged lines.

Inspect pivot point for dirt or trash buildup. Remove all dirt and trash.

Inspect transmission and differential compartment for leaks. Stop any leaks.

Inspect tandem housings for leaks and trash buildup. Stop any leaks and remove all trash.

Inspect engine compartment for oil and fuel leaks. Look for trash buildup. Stop any leaks and remove all trash.

## **Machine Controls**

### **Transmission control lock and parking break**

In the PARK position, transmission control lever is locked in NEUTRAL and parking brake is applied.

Move lever in the direction of the arrow. The transmission will remain in NEUTRAL and the parking brake is released.

This system provides stopping for the machine in the event of any single failure in the service brake system.

Secondary braking is provided by a dual circuit air system, which has a separate circuit for each set of tandem brakes. A malfunction in one circuit still leaves the machine with at least half of the original braking capacity to bring it to a stop.

In the event of a total loss of service brakes, the spring actuated, non-modulated parking brake can be applied to bring the machine to a stop. The brake fully applies; therefore, be prepared for a sudden stop.

### **Service breaks**

Push the pedal DOWN to STOP or to SLOW the machine. Also, to keep the engine from over speeding on a downgrade.

### **Accelerator**

Push the pedal DOWN to increase the engine speed above the governor control setting. Release the pedal to resume governed speed. Pull the pedal back to stop the engine.

### **Decelerator**

Push the pedal DOWN to temporarily decrease the engine speed below the governor control setting. Release the pedal to resume governed speed.

### **Governor control**

Move the lever FORWARD to decrease the engine speed.

Pull the lever BACK to increase the engine speed.

### **Transmission control**

Move the lever to the LEFT to travel FORWARD and to the RIGHT to travel BACKWARD. Pull the lever BACKWARD to select the desired gear speed.

### **Transmission modulator**

Push the pedal DOWN to disengage power to the wheels. Release the pedal to engage power to the wheels. Use the modulator pedal to slowly inch the machine.

### **Articulation**

NOTICE: Tire damage could result when articulating the machine. Do not allow the moldboard to contact the tires.

Move the lever FORWARD to articulate the rear of the machine to the LEFT.

When the desired degree of articulation is reached, release the lever and it will return to HOLD (center position). Articulation should then stop.

Pull the lever BACKWARD to articulate the rear of the machine to the RIGHT.

### **Console lock**

Unlocked – Pull the lever back to release the console.

Position the console by pulling or pushing on the steering wheel after releasing the lock.

Locked – Release the lever to lock the console.

### **Steering wheel pin lock**

Unlocked – Turn the lever COUNTERCLOCKWISE to UNLOCK the steering wheel column.

Locked – Turn the lever CLOCKWISE to LOCK the steering wheel column.

## **Implement Controls**

### **Center shift lock shift**

WARNING: Be sure to ground the moldboard before retracting the center shift lock pin.

- RETRACT – Air pressure moves the pin out of the center shift hole.
- INDEX and RUN – Spring force is applied to locate and maintain the pin in the base.
- LOCK – The pin is moved fully into the center shift hole, under air pressure.

### **Blade lift (left side)**

Raise – Pull the lever BACK to RAISE the left side of the blade.

Hold – In the center position, the blade will not move.

Lower – Move the lever FORWARD to LOWER the left side of the blade.

### **Rippers/Scarifiers**

Raise – Pull the lever BACK to RAISE the ripper/scarifier

Hold – In the center position, the ripper/scarifier will not move.

Lower – Move the lever FORWARD to LOWER the ripper/scarifier to the ground.

Refer to manual for further description of these implementations.

## **Starting The Engine**

### **Above (32 degrees)**

NOTE: The transmission gearshift lever must be in NEUTRAL and centered between REVERSE and FORWARD gear slots, before the starter motor will engage.

Move the transmission control lever to NEUTRAL. Move the parking brake lever to PARK.

Move all controls to HOLD or OFF.

Be sure the center shift control lever is in the INDEX and RUN position.

Turn the key start switch to ON.

Observe all the indicators for proper function.

The low brake pressure indicator will be off if the air pressure is above 415kPa (60 psi)

The water temperature and hydraulic temperature indicators will normally be off.

Apply the service brake several times, until the low brake pressure indicator comes ON. The fault alarm should also sound.

If any of the indicators did not function properly, have the systems checked and correct the cause.

Move the governor control lever to half engine speed.

Depress the accelerator pedal past detent.

Turn the key start switch to START. Release the switch when the engine starts.

NOTICE: Do not turn the key start switch off while the engine is running.

If the low oil pressure indicator does not go off within six seconds after the engine is running, stop the engine. Investigate and correct the cause.

If the engine does not start, let the starter cool for two minutes, then repeat starting procedures.

### **Below (32 degrees)**

Perform steps 1 through 11 for starting engine.

Turn the key start switch to START

After cranking begins, PUSH the ether start control switch and release. Use additional ether every two seconds until the engine is running smoothly.

Do not crank the engine for more than 30 seconds. Allow the starter motor to cool for 2 minutes before cranking again.

To prevent battery discharge, turn the key start switch to OFF when the engine is stopped.

For starting below -18 degrees, use of optional cold starting aids are recommended. Heating of coolant and/or use of extra battery capacity may be required.

## **FRONT END LOADER**

### **Safety**

#### **Avoid injury from rollover accidents.**

Wear your seat belt.

Do not attempt to jump clear of tipping machine. Serious or fatal crushing injuries will result.

Machine will tip over faster than you can jump free.

To avoid rollovers:

Be careful when operating on a slope.

Avoid sharp turns.

Balance loads so weight is evenly distributed and load is stable.

Carry tools and loads close to the ground to aid visibility and lower center of gravity.

Reduce speed before turning or swinging load.

Know capacity of machine. Do not overload.

Be careful when operating at the edge of an excavation, trench, or drop-off, and loading or unloading from a trailer.

Read and understand the operating instructions in this operator's manual.

**Avoid injury from back over accidents.**

Before moving machine, be sure all persons are clear of area.

Always be alert for bystanders moving into the work area. Use horn or other signal to warn bystanders before moving machine.

When using a signal person, keep person in view at all times. Be sure signal person is clear before backing up.

To avoid back over accidents:

Always look around before you back up. Be sure that everyone is in the clear.

Keep bystanders away from pivot area of an articulated machine.

Keep reverse warning alarm in working condition, if equipped.

Use a signal person when backing up if view is obstructed. Always keep signal person in view.

Learn the meaning of all flags, signs, and markings used on the job, and who has the responsibility for signaling.

Keep windows, mirrors, and lights clean and in good condition.

Dust, heavy rain, fog, etc., can reduce visibility. As visibility decreases, reduce speed and use proper lighting.

Read and understand the operating instructions in the operator's manual.

**Avoid injury from rollaway accidents**

To prevent rollaway, always make sure machine is properly secured before leaving operator's seat

Death or serious injury may result if you attempt to mount or stop a moving machine.

To avoid roll a ways:

Select level ground when possible to park machine.

Place transmission controls in neutral, move FNR lever to neutral, and engage parking brake.

Lower all equipment to ground.

Stop the engine.

Block all wheels if you must park on a grade. Position machine to prevent rolling.

Park a reasonable distance from other machines.

Read and understand the operating instructions in this operator's manual.

### **Use handrails and steps**

Falling is one of the major causes of personal injury.

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

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

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

### **Use seat belt properly**

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

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

Do not remove roll-over protective structure (ROPS)

### **Operate machine with caution**

Check location of cables, gas lines, and water mains before digging.

Keep loading area smooth.

Never lower a loaded bucket with the boom and bucket control lever in the float position.

Increase the power gradually when pulling a heavy load or when driving out of a ditch or excavation.

### **Operating on slopes**

Avoid side slope travel whenever possible. Drive up slope in forward and down in reverse. The danger of tipping is always present.

In steep slope operation, do not allow engine to over speed. Select low gear speed before starting down slope.

The grade of the slope you should attempt will be limited by such factors as ground condition, and load being handled.

### **Carrying loads**

Carry loader bucket as low as possible for better stability and visibility.

Handle only those loads, which are properly arranged. Do not overload.

Do not start, stop or turn quickly when transporting a load.

Do not change forward or reverse directions quickly when carrying a load.

### **Avoid power lines**

Serious injury or death can result from contact with electric lines.

Never more any part of the machine or load closer to electric line that (10ft) plus the twice the line insulator length.

### **Walk Around Inspection**

Check the following:

Wheels (front and rear) for loose or missing hardware

Clean operator's station

Check coolant level

Check pre-cleaner or air inlet cover

Clean radiator

Check fuel level

Check engine oil level

Check hydraulic system oil level

Check transmission oil level

Check tires (front and rear)

**Electrical system:** Check for worn or frayed wires and loose or corroded connections.

**Boom, bucket, sheet metal:** Check for bent, broken, loose, or missing parts.

**Hardware:** Check for loose or missing parts.

**Parking brake:** Check for correct operation.

**Hydraulic system:** Check for leaks, missing or loose clamps, kinked hoses, and lines or hoses that rub against each other or other parts.

**Lubrication:** Check lubrication points shown on Periodic Maintenance Chart.

**Protective devices:** Check guards, shields, ROPS, covers, seat belt.

**Safety:** Walk around machine to clear all persons from machine area.

## **Operating The Machine**

### **Boom and bucket control lever – one lever design**

Move the control lever forward to lower boom or backward to raise boom.

NOTE: To lower boom with engine stopped, key switch must be in ACC or on position (earlier units) or boom down switch must be pushed while moving control lever forward.

Move control lever left to rollback bucket or right to dump bucket.

Float (lever in full forward detent position. This position allows oil to flow in and out both ends of cylinders so the bucket can follow the contour of the ground. Manually release lever from this position.

Return-to-dig (lever in left detent position) Bucket will return to set dig position.

Boom height kick out (lever in full rear position) Lever must be in this position to use boom height control

Boom and bucket functions can be operated simultaneously by moving lever between positions.

### **General operating tips**

Carry loaded bucket low to the ground for a better view and to improve machine stability.

Keep the bottom of the bucket parallel to the ground when dozing. DO NOT doze with the bucket in dump position.

Use bucket teeth when digging in hard material.

When bucket digs in, decreasing traction, roll bucket back slightly.

In float position, the bucket will follow the contour of the ground. Use float position to back drag.

Clean and level the work area when waiting for the truck,

### **Truck Loading**

The most efficient technique for truck loading is the “V” method.

Level bucket and lower to the ground.

Run engine near fast idle to penetrate material.

Increase engine speed to fast idle and crowd into the pile.

As engine RPM starts to decrease, pull loader control lever back and to the left.

Feather hydraulics to obtain a smooth combination of bucket rollback and boom lift.

After filling the bucket, reverse loader and articulate 35-40 degrees. If truck is positioned close to the stockpile, raise boom to level position while reversing.

Travel forward to the truck while raising the boom to clear truck sideboards.  
Dump load.

Reverse direction and lower bucket to several inches above ground level.

### **Excavating**

Level bucket and lower to ground. If cutting edge does not penetrate, tilt bucket forward slightly. Make slight grade adjustments to prevent excessive or insufficient penetration.

For maximum control while cutting a grade, run loader in first gear at about ½ speed. When bucket fills, tilt back and raise to clear ground.

After the grade has been established, excavate at fast idle. As the bucket penetrates the material, feather control lever to obtain a smooth combination of bucket rollback and boom lift. This action will loosen material and permit deeper penetration as the loader exerts maximum crowd power.

On subsequent passes into the cut, keep bucket level on the ground to pick up any spillage from reversing the grade.

### **Filling**

There are two effective methods of backfilling.

**Important:** Prevent possible damage to the bell crank linkage. DO NOT bulldoze with bucket in dump position. When dozing, keep bucket bottom parallel to the ground.

**Method 1:** Use loader bucket as a dozer.

As bucket approaches the trench, material being pushed will fall into the trench.

Reverse direction without dumping bucket and reposition loader to maintain a 90 degree angle to the trench line.

**Method 2:** Push material to the trench as in method 1. Use clutch cut-off to maintain high engine RPM.

Dump material into the trench while placing FNR lever in neutral “N”.

When bucket is dumped, release clutch cut-off and reposition loader for a 90 degree angle to the trench line.

Area filling: Spread material in thin layers.

Operate at nearly full RPM and dump material while moving.

Reverse direction just prior to emptying bucket.

Loader will compact fill material as it works.

## **ROADSIDE MOWER**

### **Safety**

Rotary mowers have the inherent ability to throw debris considerable distances, as do flail mowers under certain conditions when knives are allowed to strike foreign objects. Operator caution must be taken or serious injury can result. Be sure bystanders are at a safe distance at all times.

Any R.O.P.S. (roll over protection structure) should not be drilled, welded on, or altered in any manner. Any alteration may reduce your protection.

Do not bypass the tractor neutral safety switch. Jumping or bypassing can cause tractor runaway.

Do not allow any persons on the equipment except the operator.

Loose clothing that can catch in moving parts should be avoided.

Use handholds and step-plates provided when mounting and dismounting to prevent injury.

Keep safety decals clean and replace illegible and damaged decals.

The P.T.O. shield should be in place at all times.

Extreme care should be taken when operating near loose objects such as gravel rocks and debris. These objects should be avoided.

Objects such as wire, cable, rope, chains, etc., can become entangled in the rotating parts of the head. These items could then swing outside the cutter head at greater velocities than the blades, creating an extremely dangerous condition. Inspect the cutting area for such objects prior to mowing. Never allow the cutter head to contact such items.

The rotating parts of this machine have been designed and tested for rugged use. However, these could fail upon impact with heavy solid objects such as steel guardrails, concrete abutments, etc., causing them to be thrown at very high velocities. Never allow the cutter head to contact such obstacles.

This machine is not grounded. Injury or death could result from allowing any part of this machine to contact any electrical device such as power lines, transformers, or streetlights. Identify and locate all such items prior to cutting in any area. Take extreme care to maintain a safe working distance from any such devices. Never attempt to trim tree limbs away from power lines or telephone lines.

When the boom is moved in and out the balance of the tractor changes. Be extremely careful when operating the unit on slopes.

Inspect the unit daily for such things as leaky hoses, loose bolts, kinked hydraulic hoses, worn or broken parts, and pins are locked in. Discovering these problems ahead of time can save down time or operator injury.

The boom is designed only to position the cutter head, which is attached to it. Never attempt to lift, pull, or push other objects with it. Serious injury could result from a structural failure when the boom is used for purposes other than what it was designed.

## **Mower Operation**

Once on location, lower the mower deck slightly above the material to be cut, so the mower does not have to start under a load. With tractor at an idle, engage mower. Bring tractor RPM up to 1800-2200 RPM and slowly lower deck to approximately 6" above ground level. This allows enough clearance for bottles, cans, mufflers, etc., to pass under blades. The mower skid shoes should not drag on the ground during cutting operations.

The rotary mower deck should always be carried rather than dragged on the skid shoes when mowing on the ground. Dragging the rotary mower deck increases

the side loads on the boom, decreases the horsepower available to the cutter head, and reduces the ability of the accumulator to carry part of the weight of the boom during mowing operations.

The flail mower deck should be carried so that part of the deck weight is carried by the boom and part carried by the ground roller when moving on the ground. When the flail mower is carried this way, the ground roller follows the contour of the ground more easily during mowing operations.

To ensure a clean cut, engine speed should be maintained at approximately 1800-2200 RPM. If the tractor slows to less than 1800 RPM, shift to next lower gear. Do not ride the clutch this will cause premature clutch failure. The engine should not be operated at any time at more than 2,400 RPM on the tractor tachometer.

During mower operation, the hand throttle must be used to maintain engine speed at 1800-2200 RPM. This prevents radical changes in mower spindle speeds, reducing the possibility of cutter assembly damage.

The horizontal positioning action of the boom is designed to position the cutting head and provide a limited pressure relief when excessive pressure is applied to the boom. Do not force cutting head into heavy branches or stumps. Damage to the unit may result.

When the initial pass has been made, disengage mower and return mower back to travel position. Return to start and make the next pass, etc.

**When trimming or cutting trees and shrubs, let the mower saw into them. Do not lower the mower head down directly onto a tree or stump. The mower blades are designed to cut with the end, and misuse can cause damage to the blade and a hazardous situation for the operator.**

The mower will operate more efficiently in tougher conditions and with less power if the knives are kept sharp. If the mower begins to vibrate, stop the tractor, check for wire wrapped in the spindle or knives or damaged knives. When replacing knives, replace all knives with new knives to ensure proper balance so the mower will not vibrate. Severe vibration will result, if knives with unequal wear are used.

Begin a pass at the topside of the trees and work down with each consecutive pass. Use a low speed to allow the cutting blades time to mulch as well as cut the foliage.

Do not remove the trap door from the 50-inch cutter head. The blades rotate at velocities that make them invisible.

Never leave the tractor or allow bystanders to approach the unit until all motion stops completely.

If blades jam or stop, disengage clutch and swing boom back. Normally this will clear the cutter head. If not, shut off mower, turn off tractor, set parking brake,

when all motion ceases, rest cutter head on the ground, leave the tractor, and clear cutting blades manually.

After the first day of operation, all bolts should be checked and tightened securely. This should be done periodically to ensure the bolts from becoming loose and causing damage to the tractor mower.

## **DUMP TRUCK**

### **Safety**

Support equipment and implements properly when working beneath them. Do not depend on hydraulic cylinders to hold it up. Any implement can fall if a control is moved, or hydraulic line breaks.

Stay clear of all rotating parts.

Verify adequate bridge and overpass clearances when driving.

Walkways and steps should be checked monthly to insure a proper non-slip surface. Replace or repair immediately as required.

Always wear safety restraints.

### **Pre-trip Inspection**

- Make sure that tires are properly inflated, and that there are no chips.
- Front tires must have 4/32 of an inch tread and the rear must have 2/32 of an inch.
- See that lug nuts are tight and that there is no visible rust.
- Make sure that heater/defrost works properly.
- Relieve air tanks of all moisture before departure.
- Check to see that all gauges inside cab are operational.
- Make sure that headlights, four way flashers, blinkers, and brake lights are operational.
- Make sure that all lubricant reservoirs are full, and clear of debris.
- Check exhaust for leaks.
- Inspect brakes for cracks, and wear.

### **Machine Operation**

#### **Tandem axle power divider locks control**

Tandem axle power dividers or inter-axle differentials in the forward rear axle are controlled by the above, dash mounted power divider lock switch.

Under normal highway conditions (good traction) the power divider lock switch should be in the OUT position which allows differential action between the forward, rear axle and the rear, rear axle preventing inter axle differential wear due to unequally worn or mismatched tires, etc.

The power divider lock switch should be in the IN position, which prevents inter-axle differential action, when backing under a trailer with a tractor, starting on a slippery surface (poor traction), operating off highway in mud, etc. (poor traction), or when traveling on slippery highways (poor traction). Failure to lock the power divider IN under these conditions may result in power divider differential spinout failures and costly repairs. If you encounter wheel spin conditions you power divider lock should be in.

**Caution:** Switch the power divider lock to IN only when stopped or moving at low speed. Never try to go to the IN position while your wheels are spinning as this may result in shock damage to the power divider components.

When encountering slippery highway conditions (poor traction) the power divider lock can be moved to IN at a low, even speed and momentarily letting off the accelerator will engage the differential lock. A warning light on the instrument panel indicates when the inter axle differential is locked.

When highway conditions improve (good traction) the power divider lock can be moved to OUT at a low, even speed and letting up on the accelerator momentarily will unlock the inter axle differential.

**Caution:** Do not operate with the power divider lock in the IN position on dry pavement (good traction) continuously. This will result in excessive tire wear and premature axle wear.

**Caution:** Never move the power divider lock to the IN position when your wheels are spinning.

**Caution:** Never shift a two-speed tandem axle from one range to another with the power divider lock switch to the IN position. This may cause shock damage to the inter axle differential.

## **Brakes**

**Warning:** Failure to maintain brakes in proper condition and adjustment could cause reduced braking ability and result in loss of vehicle control and personal injury.

## **Downhill operation**

Always descend hills with extreme care, relying on the braking effect of the engine to control vehicle speed. Heed warning signs posted for any grade. Before starting a descent (if a pull off area is available), stop and check the brakes for condition and adjustment.

Never coast downhill. Service brakes alone should not be used to control speed on major downgrades. Brakes will fade from overuse.

Operating engine with closed throttle and transmission/rear axle in reduced gear is the method that should be used to control downhill speed. If the gear selection will not hold the desired speed without overuse of the brakes, an improper gear selection was made.

Make a full stop. Let the brakes cool, then continue down grade in a lower gear range.

DO NOT ATTEMPT to gear down if the engine has reached maximum speed (RPM) in any gear range since it will be impossible to shift into a lower gear.

The common rule to follow in using the engine and transmission/rear axle to control vehicle speed is to select the same gear going down the hill that would be required to ascend the hill. There are some exceptions such as going down a short hill with good visibility and no hazards.

The service brakes should be used to supplement available vehicle retardation. When descending long grades requiring use of the brakes, snub applications (five to ten seconds duration) should be made rather than long, continuous applications. This minimizes temperature rise, brake fade and air consumption of air brake system.

### **Air brakes**

All air brake equipped vehicles to which this manual applies have a split brake system.

The purpose of this split system is to provide a means of stopping the vehicle should a failure occur in either the primary or secondary brake system. In the event air pressure loss occurs in one system, the remaining system continues to provide braking action.

Even though there will be enough braking capability for emergency stopping, the vehicle must not be operated when a failure is indicated, as there is no means of replenishing air pressure.

If vehicle has been parked for an extended period in cold weather, always check to be sure all wheels are rolling free (brakes are not frozen) when starting out. Always clean accumulated ice and snow from brake linkage.

### **Air gauge, low air pressure buzzer and indicator light**

Should air pressure in either section of the split air brake system be reduced to 70 PSI the warning buzzer will sound and a red light on the instrument panel will glow. Also the air gauge will indicate low air pressure in at least one of the independent systems.

The warning buzzer will automatically shut off when the air pressure in both systems is sufficient to operate the vehicle.

Should the buzzer not shut off soon after start-up, the air pressure gauge should indicate at least one section of the split system has low air pressure.

If the buzzer and gauge indicate a loss of pressure while driving, the vehicle still has a portion of the braking capability, in that either one half of the split system or the spring brake system braking capability is retained. However, the distance required to stop the vehicle will be increased.

**Warning:** To avoid loss of vehicle control and possible personal injury never operate the vehicle when insufficient air pressure (less than 70 PSI) is indicated for either system since the volume of air required to stop the vehicle may be greater than that available. Have the brake system checked and repaired before returning the vehicle to service.

### **Brake application**

Rapid successive brake applications and release, sometimes referred to as fanning or pumping the pedal, should be avoided. This is an inefficient way of slowing or stopping a vehicle and inefficient use of air pressure.

### **Parking brake**

All vehicles with air brakes are equipped with spring brakes for parking. The parking system is operated manually by a single valve, which in the case of a tractor also controls the parking system on the trailer.

The purposes of this brake are to hold the vehicle in a parked position and to assist in bringing it to an emergency stop. The parking brake should not be used to brake the vehicle during normal driving.

To apply the parking brake, pull out control. To release the parking brake, push in on control.

### **Release after emergency application**

In the event it is necessary to move the vehicle after an emergency application (before air pressure can be restored), the emergency parking spring can be compressed mechanically to release the brake. A release stud spring caging tool is furnished with the brake chamber assembly. The release stud engages in the spring pressure plate and its nut is tightened to compress, cage, the spring and release the brake.

Remove release stud assembly from carrying pocket.

Apply a light coat of never seize to the threads of the release stud to avoid any unnecessary wear of the threads. Remove the access plug from the end of the

spring chamber. Insert the release stud through the opening in the chamber and into the spring pressure plate.

Turn the release stud one-quarter turn to engage the tangs on the release stud into the slot in the pressure plate. Install the nut on the release stud. Be sure tang on release stud stays engaged with slot on pressure plate while installing the nut. Tighten the nut with a wrench to compress the spring.

### **Parking brake reset**

Charge spring brake chambers with air pressure. Loosen nut and remove the release stud and nut from the spring housing and reinstall the access plug in the chamber opening. Reinstall the release stud and nut in the carrying pocket on the brake chamber housing.

**Warning:** Under no circumstances should a spring brake chamber assembly be disassembled without following the procedures described in the service manual. Bypassing these procedures may result in severe personal injury or death.

### **Reservoir moisture draining**

Moisture taken in with the air through the compressor inlet valves collects in the reservoirs and necessitates draining each reservoir daily in cold weather and ice a week in warm weather by opening the drain cock located either on the bottom of the tank or in the end of the tank. If in the end of the tank, there must be some air pressure in the system to assure proper drainage. Be sure to close the drain cocks after all moisture has been expelled.

On vehicles so equipped, the reservoir automatic drain valve ejects moisture and contaminants from the reservoir in which it is connected. It operates automatically and requires no manual assistance or control lines from other sources. The reservoir should be drained and the valve should be examined periodically to ensure that the drain passage is not obstructed.

## **CONCRETE/ASPHALT CUTTING SAW**

### **Safety**

Inspect the complete saw for damage or improper functioning before using: Drive chains, controls, bearings, fasteners, and frame.

Before starting saw, tighten blade shaft nuts, raise saw off pavement, and put transmission control in neutral.

Do not start saw unless all safety guards are installed.

Do not operate gasoline engines indoors.

The saw blade should be inspected at least twice a day for excessive core wear, core cracks, and arbor damage. Blades exhibiting any of these signs should be immediately replaced.

To mount blade, clean the arbor and blade flanges, inspect them for damage, and fit blade properly on the arbor between inner and outer blade flanges, tightening nut securely.

Always use proper size blade guard with splash flap and check water tubes for proper functioning. Never attempt to saw without the blade guard.

Follow the blade manufacturer's safety rules for blade operating speeds.

Do not place any portion of the body in line with the blade while it is rotating.

Wear approved safety glasses, hearing protection, safety hat, gloves, rubber safety boots, and dust respirator. Continued contact with concrete slurry can cause serious skin irritation.

Never leave saw unattended with engine running.

If blade stalls in cut: Raise blade out of cut, make sure flanges and nut are tight, check blade for damage, then re-start engine.

Do not apply too much force to the handles while steering or use too high a cutting speed.

Never work under the saw without first placing a support block under the front of the saw.

When refueling saw stop engine, allow engine to cool down, do not overfill the tank, and completely clean up any spilled fuel before starting engine.

### **Engine Starting**

Set throttle control about ½ open, turn ignition switch to “start” and at the same time turn the choke knob counterclockwise only sufficient to start engine. Allow engine to warm up a few minutes before applying load.

### **Sawing Operation**

Fit blade-to-blade shaft and tighten shaft nut

Connect water line to saw.

Start engine. Turn water to blade guard on and observe water flow.

Insure that engine and blade shaft are turning at RPM specified by the blade manufacturer and that the TRANSMISSION LEVER is in “NEUTRAL” then

lower the blade smoothly and gently into the pavement by running the RAISE/LOWER CRANK in a counterclockwise direction.

Slowly push the TRANSMISSION LEVER forward to propel the saw forward. Adjust LEVER for optimum cutting performance. At the end of the sawing operation, stop forward motion by pulling the TRANSMISSION LEVER rearward and elevate the blade out of the cut by rotating the RAISE/LOWER CRANK clockwise.

## **LAYTON BOX**

### **Safety**

Keep loose clothing away from moving parts.

**Caution:** Keep aware that hot asphalt may spray and burn exposed skin.

Make sure that there are no apparent leaks on propane tank connections.

Make sure that all connections to truck are secure.

Clean battery from acid buildup on connections.

### **Layton box operation**

#### **Transport**

To pick up the paver for transporting to the job diver should first inspect the hook-up arms to see that they are in the carry position. If they are not in the correct position rotate arms to under the hopper and by using the central hydraulic system close the arms until they are against the track assembly. Then by lifting the arms individually, attach the grab hook, and allow the arms to be supported.

#### **Operation**

Rotate the hopper wings down.

Back the truck to the paver until the tailgate is centered over the front of the hopper.

Raise the dump body approximately 2/3 up.

Place the three gate hooks over the tailgate, one on each side and one in the center.

Attach the two short carry chains to the hopper bridle chains three links forward of the center of the hopper bridle chains.

Attach the short carry chains to the gate hooks on both sides of the tailgate making certain the same numbers of links are dropped on each side.

Lower dump body. This should raise the paver to give from 9 to 15 inches of ground clearance.

Attach screed hoist chain to the center gate hook and by using the central hydraulic hand pump tighten until all slack is removed from the chain.

Rotate hopper wings to 0 degrees position and lock.

**Note:** The paver should not rub against the tires or the frame of the truck. If it does move the short chains forward on the hopper bridle chains.

## **Laying Out The Job**

The Layton track paver is designed to spread materials from 8 to 12 feet wide. Because of this flexibility the following should be taken into consideration.

- To be able to spread so that the driver is next to the previous mat.
- What taper is necessary to avoid handwork.
- What width is necessary to be able to make the last panel full width?
- Are transverse joints necessary?
- Pave toward the open side of any job.
- Can one panel be spread to provide a take off to avoid blocks and handwork?

When the paver arrives on the job, sight the trailing edge of the screed to make certain of the desired crown or invert setting. Then raise the dump body of the truck to lower the paver. The carry chains and gate hooks should be taken from the truck. Disengage the grab hooks from the chains on the hook up arms, put the arms over the front of the machine, and hook the support springs into the fourth link of chain from the front of the hook up arms.

Back the truck into the machine and by using the central hydraulic system close the arms on the wheels firmly. Then place one gate hook on the center of the tailgate and affix the screed hoist chain. Using the central hydraulic hand pump raise the screed until a clearance of 4 to 6 inches is achieved. The paver is now ready for the truck to maneuver it into position.

When the truck backs the paver into position for the first spread, use two blocks of wood, the same thickness as you wish to lie as a take off for the paver. These blocks should be approximately 24 inches long, placed in the direction of travel about 6 inches in from the sides of the screed and the leading edge of the screed should coincide with the leading edge of the blocks. Use the central hydraulic system to lower the machine onto these blocks. Now the screed can be set.

Turn the depth control handles until an area of no friction is felt on the screws. Then by clockwise rotation turn the handles one and one-half full turns, set your extensions for the desired width, set chains on the truck tailgate, fill the hopper

with material and have the truck driver pull forward. As the screed moves off the blocks the compacted thickness of the mat will be the same as the blocks. After the machine has moved forward 3 to 5 feet stop to allow the screed to heat.

The Layton paver is so designed to lay materials at a predetermined thickness without adjustment to the depth control if the grade is uniform. Therefore it is not necessary to make major changes to the depth control handle unless an obstacle is being transcended. The walking beam construction and a full floating screed will tend to level minor changes in grade. However, a grade is seldom uniform so the operator can take action for major changes by looking ahead to anticipate these changes. A rule of thumb, for judging the depth of material being spread, is to look at the leading edge of extension end plate. The thickness at that point is relative to the thickness being spread.

As the machine arrives at the end of a spread have the driver let down his dump body when the front wheels are just past the line on which you want to stop. This will leave material in the hopper as to complete the spread. Move forward until you are 2 feet short of this line. Then by using the central hydraulic system close the shut-off gate and pull forward to the area you wish to stop. By using this method you will have only a small amount of material in the hopper and little or no clean-up work. Then use the hydraulic screed hoist to raise screed.

Do not latch tailgate.

Do not clean apron

Do leave hook-up arms attached.

Do leave the track firmly on the ground.

The truck is ready to maneuver the paver into position for the next spread.

This paver is capable of raking its own hot joints and as you prepare for the next spread overlap the extension about 3 inches over the previous panel.

There is a variance in height yet there is exactly the same amount of material under the screed as there is under the extensions. As the paver moves down the panel it will rake over the previous panel and deposit the right amount of material to provide a tight joint.

As you start the next panel and any subsequent spread, make certain that the shut-off gate is opened for it is impossible to pave with it closed.

Upon completion of any job the machine should be thoroughly sprayed or washed with diesel fuel to prevent build up of materials. Pay particular attention to bump rolls, extensions and tracks.

## **FORKLIFT**

### **Safety**

Operator must be trained to drive the lift truck, and must understand safety techniques and rules for lift truck operation.

Inspect the lift truck before operating. Do not operate lift truck if it is in need or repair. If it is in need of repair, tag the lift truck remove the key, and report the condition to the proper authority. Do not attempt repair unless you are trained and authorized for repairing.

Do not remove overhead guard or backrest unless specifically authorized.

Make sure that forward-reverse lever is set in neutral and hand brake is applied before starting the engine. Do not start or operate the lift truck if you are not in designated operator's position.

Do not allow anyone on any part of the lift truck while moving or lifting.

Keep hands, feet and other parts of your body inside the operator's compartment at all times.

Do not allow anyone to stand or walk under the elevated portion of the lift truck whether it is empty or loaded.

Always carry loads low with the mast tilted to the backmost position. Do not elevate loads except during stocking.

Maintain a careful lookout for people and obstructions, and watch the path of travel. Watch clearances, especially overhead and tail swing. When visibility is obstructed, use extreme caution.

If the load obstructs the front view, drive the lift truck in reverse.

Do not overload lift truck. Check the load chart for load weight and load center information. Always pick up loads as close to weight center as possible to avoid off-center loading.

Avoid sudden starts, stops or turns. Slow down for turns and on uneven or slippery surfaces that could cause lift truck to overturn or slide.

Use special care when traveling without load, as risk of lateral overturn may be greater than when traveling with load.

Before entering trucks or trailers, be certain the brakes on the truck or trailer are applied and the wheel chocks are in place or trailer is locked to the loading dock.

Use special care when operating on slopes. Travel slowly and do not angle across or turn.

When ascending slopes, drive the lift truck with the load facing upgrade.

Do not handle unstable or loosely stacked loads. When handling long, high or wide loads, use special care to ensure stability and carefully watch the surrounding conditions.

When approaching cross aisles, slow down, and sound horn if visibility is obstructed.

Before leaving the lift truck, be sure that forks or attachments are lowered, forward-reverse lever is in neutral, hand brake is applied and key switch is turned off. Avoid parking lift truck on a slope.

When filling the tank with fuel or recharging the battery, stop the engine and place the lift truck only in designated area with good ventilation. Keep away from arcs, sparks, flames or lit cigarettes.

### **Operation/Starting**

Check the hand brake for setting, and place the forward-reverse lever in the neutral position.

If necessary, pull out the choke control knob and depress the accelerator pedal and keep it depressing until the engine starts.

Turn the ignition key to the extreme right. Release the key as soon as the engine starts.

**Do not turn the starting motor for more than 10 seconds at any time. It is not good for the starter motor to run for long time.**

### **Loading**

Adjust distance between the forks symmetric to the center line of the lift truck. The wider the interval between forks, the better the balance. Be sure to apply the fork stoppers after setting the forks.

Approach slowly, straight toward the load, and stop just in front of it. Adjust mast to vertical position, matching the height of the forks to the position of the pallet. Advance the load. Set the forward-reverse lever to the neutral and apply the hand brake. Then raise the load. Confirm that the load is stable and tilt it backward. Release the hand brake and back the lift truck slowly.

### **Transporting Loads**

When transporting loads, the lift truck should be driven carefully at slow speed with the load kept low and tilted back. When the load is big enough to block forward visibility, drive the lift truck backward. Follow the safety rules.

### **Unloading**

Slowly approach the unloading site and stop facing straight ahead.

Move the forward-reverse lever into neutral and apply the hand brake. After adjusting the mast to the vertical position, raise the load a little above the stack on which it is to be placed. Release the hand brake and advance slowly into the proper position for stowing. Apply the hand brake and place the forward-reverse lever in neutral.

Slowly lower the forks to set down the load. After moving the forward-reverse lever to reverse, release the hand brake and back the lift truck up until the forks separate completely from the load.

## **BOOM TRUCK**

### **Safety**

One hazard associated with installing or servicing this machine is lifting heavy objects. This is true whether the lifting is being done manually or mechanically. Items such as booms and pedestals must be adequately supported. Care must be taken to balance these items and to keep personnel clear when lifting.

No attempt should be made to clean, oil, or adjust a machine while it is in motion. Special care should be used while covers are removed and covers should be replaced when work is completed.

Fire is a hazard where wet paint, fumes, or hydraulic oil is exposed to heat sources.

It is extremely important to relieve pressure from the hydraulic system before removing lines/hoses. This may usually be done by activating the control valve while the hydraulic power source is off or disengaged. Other times, fittings must be loosened slightly to relieve pressure.

A stability test must be performed on the unit after it is mounted. This should be done before anyone operates the lift from the bucket.

After servicing any portion of the hydraulic system, extend and retract the hydraulic cylinders several times to force any trapped air from the system. Do not operate the lift from the bucket until this is done.

Safety decals are an important part of the versa lift. If they are defaced, illegible or lost, they should be replaced.

**Danger: You must not operate this machine unless you are qualified by training and experience in its safe operation. Training includes complete knowledge of your employer's work rules, all governmental regulations, and**

**this operator's manual. Untrained or careless operators subject themselves and others to death or serious injury.**

The two main hazards associated with operating this equipment are:

- Electrocution when operating near power lines.
- Injuries caused by falling due to equipment failure or unstable operation.

It is the responsibility of the operator to see that the equipment is not operated unless it is maintained in safe condition. Maintenance and service procedures are outlined on the following pages of this manual, as are the details of operation.

No manual can cover every situation that might arise. Therefore, the most important factor in the prevention of accidents is good judgment and common sense on the part of the service personnel and operator.

## **Operation**

### **Parking**

Park the truck on firm level ground.

**Caution:** Never operate lift with truck parked on a slope exceeding 5 degrees.

If this condition is exceeded, the truck may become unstable and tip over. Additionally, excessive loads are induced in the rotation system. If it is necessary to work on a slight incline, it is recommended that the truck be backed down the incline to the work position.

Before leaving the cab, set the parking brake and the brake lock is so equipped. Put the truck transmission into neutral and turn on flashing signal lights if equipped. For PTO equipped units depress the clutch and engage the PTO.

Place chocks under wheels. If the truck is equipped with spring lockouts, insert the lockout pins into the holes in the tube on both sides of the truck bed to prevent the truck from leaning while operating the lift.

**Caution: Never operate lift without vehicle stabilizers engaged, if so equipped.**

### **Lift controls**

The movement of the lift may be controlled from the bucket or at the pedestal.

The bucket controls consist of three toggle switches located on the control panel at the upper end of the telescoping boom, within easy reach of the operator. These switches are oriented so that a movement of a switch results in a corresponding movement of the bucket. They are spring loaded in the neutral or off position. Moving the switch handle in the direction of an arrow causes the

bucket to move in a corresponding direction. When the switch handle is released, it springs back to the neutral position, and lift movement stops.

The switch marked RAISE and LOWER controls the up and down movement of the boom. The switches marked EXTEND and RETRACT controls the action of the upper telescoping section of the boom. The switch marked CCW and CW controls the rotation of the boom.

**Caution:** Never change direction of rotation by immediate reversal of control. Allow rotation to stop then resume in opposite direction.

The rotation system is equipped with a limit switch that prevents more than 360 degrees of rotation. When the boom is rotated so that the limit switch is reached, the rotation will stop. Simply reverse the control and rotate in the opposite direction to position the bucket in the desired location. Both upper and lower booms have a mechanical stop to limit their travel. When this stop is reached, release the control switch to prevent overheating of the hydraulic oil and short pump life. On DC powered models, actuation of a control switch automatically starts the DC pump-motor, so that this pump-motor runs only when required, conserving battery life.

Two or three controls may be actuated simultaneously, depending on the bucket load and which functions are operated. If the bucket is heavily loaded and two switches are operated simultaneously that each require high pressure (for example, EXTEND and RAISE) the total system pressure may exceed the setting of the relief valve. This causes some of the oil to bypass through the relief valve. While this is not detrimental to the lift, it results in noise and reduced operating speed and should be avoided. Generally, rotation (which is a low pressure function) may be operated in conjunction with any other function. Also, RETRACT, LOWER, and ROTATION (as would be used in returning the boom to the stowed position from a working position) may usually be operated simultaneously.

Using the six buttons at the pedestal may also operate the lift. The function of each button is shown on the operational nameplate adjacent to each button.

**Caution: When boom is rotated from pedestal, the electrical limit switch will not prevent over rotation. Do not rotate more than 180 degrees from stored position.**

### **Engine start/stop**

Engine start and stop buttons are located on the control panel at the upper end of the telescoping boom. The small black button labeled ENGINE START activates the engine starter. The truck engine ignition must be on before this button can be used to start the truck. The large red button labeled ENGINE STOP breaks the ignition circuit and kills the engine. It must be held depressed until the engine has completely stopped.

**Caution:** Make sure the truck transmission is in neutral before activating starter from bucket.

### **Bucket lock**

Versa lifts with gravity leveling are equipped with a positive bucket locking pin that prevents swinging of the bucket after it has been placed in a working position. This locking mechanism is located on the upper telescoping section of the boom just above the bucket pivot point. As a safety feature, it is spring loaded in the locked position to prevent accidental release. To lock the bucket, turn the locking knob to the left until the internal spring pulls it in. It may be necessary to slightly swing the bucket from side to side until the locking pin engages a hole in the bucket shaft. To release the bucket lock, pull the knob straight out and rotate to the right to hold out.

### **Shut down**

After the boom has been stored in the boom cradle, swing the bucket up and hook to boom. Remove chocks and disengage spring lockouts and PTO if so equipped.

**Caution:** Do not drive truck unless boom is stored.

### **Emergency procedures**

In the event the unit is damaged while a man is in the air, or an emergency arises after he has gone aloft, immediately rotate the bucket away from any dangerous obstruction into a clear line of descent when the booms are lowered. The machine should be operated through the shortest cycle possible to get the bucket on the ground; then operated from the pedestal control to finish storing the boom. Possible conditions and suggested procedures.

**Bucket control switch failure:** Should any control movement not stop when the switch is released, immediately push the ENGINE STOP switch (on PTO, generator and belt driven models). Hold the opposite control before attempting to restart engine to see if control is cleared.

**Engine will not start but will crank:** (PTO, generator and belt driven models): Boom may be stowed by activating the appropriate control toggle switch while cranking the engine with the engine start button. Crank intermittently at intervals of 30 seconds to conserve battery.

**Hydraulic line failure:** If partial failure is experienced and holding valves do not lock, use controls in short intervals to store booms. Should a complete line failure occur, the holding valves will lock and must be released.

**Power or pump failure:** If boom is extended over the side, the hex extension on the gearbox input shaft may be rotated to manually align booms with cradle. Store bottom boom by releasing holding valve and activating controls to allow oil to pass through valve and back to reservoir from cylinder, lowering the boom. To

retract the upper telescoping section, release its holding valve, activate the retract control, then manually push the upper section fully in.

**Man disabled or unconscious in bucket:** Turn bucket override switch to BUCKET OVERRIDE. Using the controls at the pedestal, rotate boom clear of obstructions, retract upper boom and lower to ground.

**Bucket leveling system malfunction:** (Hydraulic leveling option); If, with operator in the bucket, the bucket starts to stow or a malfunction occurs in the bucket leveling system activate the ENGINE STOP button to kill the engine and stop the pump.

From the pedestal controls activating the BUCKET OVERRIDE to OVERRIDE should shut the pump down.

Turning off the truck engine with the key switch will also shut the pump down.

## **MOBILE AIR COMPRESSOR**

### **Safety**

Never operate unit without first observing all safety warnings and carefully reading the operation and maintenance manual shipped from the factory with this machine.

Air discharged from this machine may contain carbon monoxide or other contaminants, which will cause severe injury or death. Do not breathe this air either directly or indirectly in a confined space.

Never operate the engine of this machine inside a building without adequate ventilation. Avoid breathing exhaust fumes when working on or near the machine.

No smoking, sparks, or open flame near fuel.

A battery contains sulfuric acid and can give off gases, which are corrosive and potentially explosive. Avoid contact with skin, eyes and clothing. In case of contact, flush area immediately with water.

Exercise extreme caution when using booster battery. To jump battery, connect ends of one booster cable to the positive terminal of each battery. Connect one end of the cable to the negative terminal of the booster battery and other end to a ground connection away from dead battery (to avoid a spark occurring near any explosive gases that may be present). After starting unit, always disconnect cables in reverse order.

This machine produces loud noise with the doors open or service valve vented. Extended exposure to loud noise can cause hearing loss. Always wear hearing protection when doors are open or service valve is vented.

This machine contains high-pressure air, which can cause severe injury or death from hot oil and flying parts. Always relieve pressure before removing caps, plugs, covers or other parts from the pressurized air system.

Air pressure can remain trapped in an air supply line, which can result in serious injury or death. Always vent air supply line at tool or vent valve before performing any service.

Unrestricted air flow through a hose end will result in a whipping action which can cause severe injury or death. Always attach a safety flow restrictor to each hose "At the source of supply or branch line" in accordance with OSHA reg. 29cfr sect. 1926.302 (b).

Never inspect or service unit without first disconnecting battery cable(s) to prevent accidental starting.

Use extreme care when removing a pressure cap from a liquid cooling system for the engine. The sudden release of pressure from a heated cooling system can result in a loss of coolant and severe personal injury.

Towing this vehicle at excessive speeds or with underrated tow vehicle can result in loss of driving control and greater stopping distances. Always determine the maximum safe towing speed and tow vehicle rating before towing.

Do not store hazardous (combustible, etc.) material in or on this unit.

Thoroughly clean up any fuel spills occurring inside this unit.

Never run unit with guards, covers or screens removed. Keep hands, hair, clothing, tools, blow gun tips, etc. Well away from moving parts.

Do not use petroleum products (solvents or fuels) under high pressure as this can penetrate the skin and result in serious illness. Wear eye protection while cleaning unit with compressed air to prevent debris from injuring eye(s).

Always make sure wheels, tires and tow bar connectors are in safe operating condition and tow bar is properly connected before towing.

Do not suspend this machine with other equipment hanging from running gear.

**Caution:** Use extreme care to avoid contacting hot surfaces (engine exhaust manifold and piping, air receiver and air discharge piping, etc.)

Do not connect the air discharge on this unit onto a common header with any other unit of any description, or any other source of compressed air, without first making sure a check-valve is used between the header and the unit. If this unit is

connected in parallel with another unit of higher discharge pressure and capacity, a safety hazard could occur in a back-flow condition.

Ether is an extremely volatile, highly flammable gas. Use sparingly! If too much is injected, the uncontrolled explosion may result in costly damage to the engine.

Never allow the unit to sit stopped with pressure in the receiver-separator system. As a precaution, open the manual blow down valve.

## **Operating Procedures**

### **Before starting**

Open the manual blow down valve to ensure pressure is relieved in receiver-separator system. Close valve in order to build up full air pressure and ensure proper oil circulation.

Check battery for proper connections and condition.

Check the compressor lubricating oil level. The proper oil level is mid-way on the sight gauge. Add oil if the level falls to the bottom of the sight gauge when the unit is not running. Do not overfill.

Check the engine lubricating oil level. Add oil if low on dip-stick.

### **Liquid cooled engine**

**Warning:** Do not remove the pressure cap from a hot radiator. Allow radiator to cool down before removing pressure cap.

Check the engine coolant level in the coolant reservoir beside the radiator. If needed, add coolant at the reservoir.

**Notice:** If the appropriate mixture of antifreeze is not used during freezing temperatures, failure to drain the engine may cause costly damage.

**Warning:** No smoking, sparks, or open flame near fuel.

Check the fuel level. This can be done visually or, if equipped with a fuel gauge, by rotating the master switch to “on”.

**Notice:** To minimize condensation (water) in the fuel tank, fill the tank at the end of each day.

**Warning:** This machine produces loud noise with doors open. Extended exposure to loud noise can cause hearing loss. Wear hearing protection when doors or valve(s) are open.

Close the side doors to maintain a cooling air path and to avoid recirculation of hot air. This will maximize the life of the engine and compressor and protect the hearing of surrounding personnel.

### **Starting gasoline engine**

Pull the choke knob all the way out. In hot weather or on restarts, less choke may be adequate.

The SERVICE-AIR button (2-way or run-start valve) should be extended.

**Notice:** Normally the manual blow down valve should be closed but in extremely cold weather, opening this valve partially will allow the engine to crank faster and start at a reduced load. Once the engine is running, close the valve slowly to ensure lubrication of the compressor.

**Caution:** Ether is an extremely volatile, highly flammable gas. Use sparingly! If too much is injected, the uncontrolled explosion may result in costly damage to the engine.

If equipped with the optional cold starting aid (ether), operate the valve once or twice **ONLY** while the engine is cranking.

Rotate the master switch to “on”.

**Notice:** The low engine oil pressure and alternator not charging lamps should be lit. If these are not lit, find and correct the problem.

**Warning:** Exercise extreme caution when using a booster battery to start. To jump-start, connect the ends of one booster cable to the positive terminals of each battery. Then connect one end of the other cable to the negative terminal of the booster battery and the other end to the engine block.

After starting reduce engine speed to idle.

Disconnect negative cable from engine block; then from booster battery.

Disconnect positive cable from both batteries.

Rotate the master switch to the “start” position. The starter motor should crank the engine.

**Notice:** Do not operate the starter motor for more than 10 seconds without allowing at least 30 seconds cooling time between start attempts.

Release the master switch when the engine starts and sustains running.

Allow the engine to warm up for 3 to 5 minutes.

**Notice:** In ambient temperatures below 32 degrees the regulator system can become inoperative due to frozen condensate. This will result in “popping” the safety valve or the unit unloading unexpectedly.

Should the safety valve “pop”, open the manual blow down valve prior to pushing the SERVICE AIR button. The engine speed and discharge pressure should rise. Slowly close the manual blow down valve while watching the pressure gauge to ensure that it does not exceed 130 psi (900 kPa). If the discharge pressure reaches 130 psi, stop closing the manual blow down valve until the regulation system can thaw. Proceed to slowly close the manual blow down valve completely.

Should the unit unload unexpectedly, it is advisable to apply heat to the regulation orifice.

Push the SERVICE-AIR button. The discharge pressure should rise to approximately 120 psi. If there is no air being consumed the compressor will unload (the inlet valve will close automatically and the engine speed drop).

**Notice:** None of the panel lamps should be glowing. If they are, shut unit down.

The compressor is now ready to furnish air when the service valve is opened.

Monitor the air discharge pressure. This should not drop below 70 psi for adequate compressor lubrication. Also do not exceed the CFM capacity of this unit with the total air requirements of attached tools and equipment.

### **Stopping**

Close all service valves.

Allow the unit to run at idle for 3 to 5 minutes to reduce the engine temperatures.

Rotate the master switch to “off”.

**Notice:** Once the engine stops, the automatic blow down valve will begin to relieve all pressure from the receiver-separator system.

**Caution:** Never allow the unit to sit stopped with pressure in the receiver-separator system. As a precaution, open the manual blow down valve.

**Notice:** The factory-installed “y” service valves include provisions to vent any attached service airline and tool(s) when the “y” valves are closed.

## **VIBRATORY ROLLER**

### **Safety**

Always wear seat belt.

Do not carry other persons while in operation.

Do not stand in operator's blind spots.

Due to loud noise of the machine use the proper (PPE) when necessary.

## **Operation**

### **Starting the machine**

Close the choke.

Check, whether the travel lever is locked to the right in braking position.

Shift the throttle lever to position "min".

Check, whether the emergency stop switch is unlocked.

Turn the ignition key to position "1".

**Caution:** Do not attempt to start for longer than 20 seconds without interruption, but interrupt the starting process for a minute.

If the engine has not started after two attempts perform troubleshooting.

Turn the ignition key to position "2", the starter will crank the engine.

As soon as the engine ignites return the ignition key to position "1".

If the vibration starts to run after starting the engine, press the vibration push button immediately to switch the vibration off.

Open the choke slowly.

### **Driving The Machine**

**Danger:** Wet and loose soils considerably reduce the ground adhesion of the machine on inclinations and slopes.

Soil conditions and weather influences impair the grad ability of the machine.

Do not drive up and down inclinations exceeding the maximum grad ability of the machine.

Never drive without fastening your seat belt.

Always give way to loaded transport vehicles.

Before starting to drive, make sure that the drive range is free of dangers.

Drive and operate the machine only from the driver's seat.

Shift the throttle lever to position "max".

Unlock the travel lever by shifting it to the left out of braking position and move it slowly to the desired travel direction.

### **Operating the parking brake and stopping the machine**

Move the travel lever to position "0". The machine is automatically braked by the hydrostatic drive.

Push the travel lever to the right into parking brake position.

### **Switching the vibration on or off**

Move the travel lever slowly to the desired travel direction.

Actuate the vibration push button on top of the travel direction.

To turn off simply push the button again.

### **Switching the gravity sprinkler system on or off**

To turn on put cock valve in forward position.

To turn off put cock valve in reverse position.

### **Stopping the engine/machine**

Move the travel lever to position "0". The machine is automatically braked by the hydrostatic drive.

Push the travel lever to the right into parking brake position.

Shift the throttle lever back to position "MIN"

Turn the ignition key to "0" to shut the engine down.

## **MOBILE PAINT SPRAYER**

### **Safety**

Watch for over spray.

Use the proper PPE when handling hazardous chemicals.

## **Spray Techniques**

Use water rather than paint to practice spraying technique and positioning guns.

Be sure the tip guard is always parallel to the ground and the wings of the spray tip guard face the front and back of the unit.

Use the lowest pressure necessary for good atomization. High pressure may cause excessive paint build up and over spray.

Start moving the machine before triggering the guns to prevent a build up of paint at the beginning of the line. Release the trigger a second before stopping the machine. Always move at an even rate of speed.

Always check your gun adjustments on cardboard or paper before starting each job.

Keep in mind that many factors affect the straightness of a line, including uneven surfaces, potholes, rocks and other debris and a clogged or worn spray tip.

To minimize the effect of bumps on the spray pattern, keep the spray tip close to the front wheel axis.

The spray tip size and the rate at which you move the unit affect the coating thickness. Generally, the faster you move the unit, the larger the spray tip orifice should be. The fan width of the spray tip indicates approximately how wide the line will be.

Position the guns to suit your requirements.

Traffic paints may be formulated for air spray, airless spray or have no formulation description. Generally, air spray formulas are pre-thinned, and will work well with airless units, but there may be more over spray. Non-air spray formulas tend to deliver more lineal feet of line per gallon with less over spray, since they are less easily absorbed into the pavement.

If you use fast-drying traffic paint on a hot day, float compatible solvent on top of the paint will prevent it from forming a skin on top.

Always flush the machine thoroughly after each use.

## **Start up and prepare to paint**

Fill the paint tank(s) with desired color of paint.

Make sure the paint pump switches located in the cab are off.

Open the air relief valve located beneath the air holding tank.

Start the auxiliary engine. Allow the engine to warm up for at least two minutes.

Close the air relief valve on the air holding tank.

Open the paint recirculation valve. Make sure the valve from the solvent tank is closed.

Open the main paint tank valve located on the paint pump and turn the paint pump switch on to begin the pump stroke.

Set the hydraulic relief valve located on top the hydraulic pump, to desired setting.

Allow the paint to circulate back into the tank for a minute to assure proper agitation of the paint.

Close the recirculation valve to allow the pump to build pressure in the lines. NOTE: For machines with pulsation chambers, this may take a minute for the paint to fill all cavities before building pressure.

Upon pressurizing, set the hydraulic pressure to 800-1000 PSI on the gauge located on the paint pump. NOTE: Hydraulic pressure lines create heat during use. It is suggested that gloves be worn at all times when working with airless hydraulic systems.

Open the ball valve to the strainer assembly to allow paint to the manifold assemblies located beside the paint pump.

Open ball valves to desired spray gun(s).

Turn the power switch to the ON position on the skip line control box. NOTE: Always reset the unit upon starting.

Test the spray guns to assure accurate line width and output.

Begin striping.

### **Line width adjustment**

Several factors affect line width: Vertical distance of the spray tip to the spraying surface, spray tip fan pattern, using one or more guns, paint pressure, and a worn or clogged spray tip.

The typical conditions for a 4 in. wide line are: 321 size tip, the gun positioned one inch from the lowest vertical position, and just enough pressure to atomize the paint.

To decrease line width, lower the gun (if possible) or use a tip with a narrower fan pattern.

To increase line width, raise the gun, or use a tip with a wider fan pattern, or use multiple guns.

### **When to flush**

Flush a new machine to remove any contaminants in the line.

NOTE: Before using water base paint, use compatible solvent, then soapy water, and then clean water.

Before using oil base paint, use compatible solvent. Flush until clear.

Changing colors. Use a compatible solvent. Flush until clear.

Changing from water base to oil base paint. Use warm, soapy water, and then a compatible solvent.

Changing from oil base paint to water base paint. Use a compatible solvent, then warm, soapy water, and then clean water.

Storage, After the compatible solvent flush, relieve pressure, but do not drain the compatible solvent.

Start up after storage. Before using water base paint, flush out the compatible solvent with soapy water, and then with clean water.

When using oil base paint, flush out the compatible solvent with the paint to be sprayed.

### **How to flush**

Relieve the paint line pressure by opening the recirculation valve. This will allow the paint to flow directly back into the paint tank.

Remove the filter bowl and screen. Install the filter bowl and support, without the screen, to flush it. Clean the screen separately.

Close the recirculation valve to allow flow to the gun(s).

Remove the spray tips from the guns to prevent splashing.

Follow the start up procedures as though you were preparing to paint.

Allow the solvent to flush through the spray guns until solvent is running clear.

NOTE: If a considerable amount of paint is still in the paint tank, drain all the paint possible by pumping into a bucket or drum. When using water base paints,

a wet type shop vacuum may be used to completely remove all excess paint from the tank.

Replace the cleaned or a new screen in the filter housing.

NOTE: Flushing or cleaning high-pressure spray equipment with coating or flushing fluids containing flammable solvents:

The flushing or cleaning operation for high-pressure equipment must be performed in a well-ventilated area. Other electrical equipment must not be operated during the flushing. If the flushing is done in a spray booth, the exhaust fan must be operating.

Stop the pump and relieve pressure by slowly turning the pressure relief valve.

Remove the nozzle tip from the gun.

Ground the waste receptacle. Use an open metallic receptacle only.

Bond the spray gun to the waste container with a grounding wire.

Be sure the pump is grounded. Never operate the pump while it is on a non-grounded platform such as a wood pallet, in a station wagon, or on a truck.

Operate the pump at the lowest possible pressure and direct the stream into the waste container. Flush until the solvent runs clear.

## **COCUT PROFESSIONAL/SIGN MAKING MACHINE**

**For information on this machine refer to the manufacturer's operation manual.**

## **CAMERA VAN**

**For information on this machine refer to the manufacturer's equipment/maintenance manual.**

## **CHAINSAWS**

### **Safety**

Working in a tree requires the use of special cutting and working techniques, which must be observed in order to reduce the increased risk of personal injury. Never work in a tree unless you have received specific, professional training for such work, including training in the use of the safety and other climbing

equipment, such as harnesses, ropes, belts, climbing irons, snap hooks, carabineers, etc.

The use of any chainsaw may be hazardous. The saw chain has many sharp cutters. If the cutters contact your flesh, they will cut you, even if the chain is not moving. At full throttle, the chain speed can reach 45 (MPH).

It is important that you read, fully understand and observe the following safety precautions and warnings.

Reactive forces, including kickback, can be dangerous. Careless or improper use of any chainsaw may cause serious or fatal injury. Pay special attention to the section on reactive forces.

All safety precautions that are generally observed when working with an axe or a handsaw also apply to the operation of chainsaws. However, because a chainsaw is a high-speed, fast-cutting power tool, special safety precautions must be observed to reduce the risk of personal injury.

Minors should never be allowed to use a chainsaw. Bystanders, especially children, and animals should not be allowed in the area where a chainsaw is in use. Never let the saw run unattended.

Do not operate a chainsaw when you are fatigued. Be alert. If you get tired while operating your chainsaw, take a break. Tiredness may result in loss of control. Working with any chainsaw can be strenuous. If you have any condition that might be aggravated by strenuous work, check with your doctor before operating a chainsaw.

**Warning:** Prolonged use of chainsaws exposing the operator to vibrations may produce white finger disease or carpal tunnel syndrome.

These conditions reduce the hand's ability to feel and regulate temperature, produce numbness and burning sensations and may cause nerve and circulation damage and tissue necrosis.

All factors which contribute to white finger disease are not known, but cold weather, smoking and diseases or physical conditions that affect blood vessels and blood transport, as well as high vibration levels and long periods of exposure to vibration are mentioned as factors in the development of white finger disease. In order to reduce the risk of white finger disease and carpal tunnel syndrome, please note the following.

Many models are available with an anti-vibration system designed to reduce the transmission of vibrations created by the engine and cutting attachment to the operator's hands. An AV system is recommended for those people using chainsaws on a regular or sustained basis.

Wear gloves and keep your hands warm. Heated handles, which are available on most power heads, are recommended for cold weather use.

Keep the saw chain sharp and the saw, including the AV system, well maintained. A dull chain will increase cutting time, and pressing a dull chain through wood will increase the vibrations transmitted to your hands. A saw with loose components or with damaged or worn AV buffers will also tend to have higher vibration levels.

Maintain a firm grip at all times, but do not squeeze the handles with constant, excessive pressures, take frequent breaks.

All the above mentioned precautions do not guarantee that you will not sustain white finger disease or carpal tunnel syndrome. Therefore, continual and regular users should monitor closely the condition of their hands and fingers.

**Warning:** The ignition system of your unit produces an electromagnetic field of a very low intensity. This field may interfere with some pacemakers. To reduce the risk of serious or fatal injury, persons with pacemaker should consult their physician and the pacemaker manufacturer before operating this tool.

Clothing must be sturdy and snug fitting, but allow complete freedom of movement. Avoid loose fitting jackets, scarves, neckties, jewelry, flared or cuffed pants, unconfined long hair or anything that could become entangled with the saw or brush. Wear overalls or jeans with reinforced cut retardant inserts or cut retardant chaps.

Protect your hands with gloves when handling saw and saw chain. Heavy-duty, non-slip gloves improve your grip and protect your hands.

Good footing is most important in chainsaw work. Wear sturdy boots with non-slip soles. Steel-toed safety boots suitable for climbing in trees are recommended. To reduce the risk of injury to your eyes never operate a chainsaw unless wearing goggles or properly fitted safety glasses with adequate top and side protection.

Wear an approved safety hard hat to protect your head. Chainsaw noise may damage your hearing.

Always wear sound barriers (ear plugs or ear muffs) to protect your hearing. Continual and regular users should have their hearing checked regularly. Any crew member in the cutting area should also wear proper protective clothing, especially hard hats, to protect their heads.

### **Starting/stopping the engine**

Push hand guard forward: The chain is now locked.

Press throttle trigger interlock and set master control lever to: Choke for cold start and run for warm start.

Place your saw on the ground. Make sure you have a firm footing. Check that the chain is not touching any object or the ground.

Hold the saw firmly on the ground with your right hand on the top handle and your right knee resting on the carburetor box cover.

Pull the starter grip slowly with your right hand until you feel it engage, and then give it a brisk strong pull and push down the front handle at the same time.

Do not pull out starter rope to its full length. It might otherwise break.

Do not let the starter grip snap back. Guide it slowly and vertically into the housing so that the starter rope can rewind properly.

### **When engine begins to fire**

Move master control lever to the run position and continue cranking. As soon as engine runs, immediately blip the throttle trigger. The master control lever will move to the on position and the engine will settle down to idling speed.

As the chain brake is still engaged, the engine must be returned to idling speed immediately or the engine and chain brake might otherwise be damaged.

Pull the hand guard back toward the top handle. The chain brake is now disengaged and your saw is ready for operation.

Always disengage chain brake before accelerating engine. High revs with the chain brake engaged will quickly damage the power head and chain drive.

## **Concrete/asphalt grinder**

### **Safety**

Avoid the danger of explosions and fire.

Never use the machine in an area where there is the threat of explosions.

Do not remove protection equipment.

Only operate the machine if all operating protection equipment has been attached and is in working order.

Never leave machine unsecured.

Before you leave the machine, turn off the motor!

Secure the machine with the standing brake.

Interrupt the ignition contacts or pull out the plug leading to the power supply

Keep other people at a distance!

Do not allow other people to touch the machine.

Keep people who are not wearing protective clothing, protective goggles and earplugs away from the area in which you are working.

**Warning:** Check your machine for damage.

Check that all moveable parts are functioning correctly. Check that they do not jam and those parts are not damaged.

To guarantee the machine's perfect operation, all parts must be assembled correctly and all requirements must be fulfilled.

Damaged protection appliances and parts must be expertly repaired or replaced at by a mechanic.

Maintain order in the area in which you are working.

Use the machine only on horizontal surfaces.

The surface treatment machine may only be used on horizontal surfaces.

Make sure that all the wheels are standing firm on the surface to be treated.

Wear suitable protective clothing.

The machine operator must wear earplugs and safety shoes that do not slip.

When doing work, which causes dust, wear a dust mask.

Keep the spread of dust at a minimum when treating surfaces.

Whenever possible, attach an efficient industrial vacuum cleaner onto the machine.

Cover the surface with some water, in case it proves impossible to use a vacuum cleaner.

Make sure that the surface treatment machine is always ready for action.

Service and clean your machine regularly.

Follow the service regulations and the instructions for the change of tools.

Keep handles free from oil and grease.

Take care when refueling or transferring fuel.

Only refuel in the open air. Never empty the machine of fuel in enclosed areas or an area with bad ventilation.

Never refuel if the motor is running or is still hot.

Do not refuel in the vicinity of bare flames.

Do not smoke while refueling or emptying the machine of fuel.

Never work with machines powered by internal combustion motors in an enclosed space.

Avoid poisoning caused by carbon monoxide fumes.

Do not burn yourself on the hot motor.

Allow the motor to cool down before doing any maintenance work.

### **Machine Operation**

Start up the internal combustion motor.

Wait until the motor reaches the necessary operating number of revolutions and the operating performance.

Grip the machine tightly by the steering strap.

Lower the positioning handle.

Move the machine forwards or backwards at a constant speed.

Maneuver the machine by either pressing the drawbar down or lifting it up.

## **PROPANE TORCH**

### **Safety**

**Warning:** The tank contains hazardous gases than can be explosive.

Make sure to check that there are no leaks coming from the propane tank.

Make sure that the service line in not chaffed, split or cracked.

Gloves should be worn when using this equipment.

**Caution:** The piece of equipment produces high temperature flames, and if misused can cause serious injuries.

### **Operation:**

Open the valve counter-clockwise at the top of the tank.

Create an ignition source at the front of the wand.

**Caution:** An initial flame will flare, and may cause burns.

After pilot flame is created use the trigger to allow more gas to the tip of the wand.

When done with the torch turn the valve clockwise to close.

## **FILLING PROPANE TANKS**

### **Safety**

**Warning:** Propane is an explosive gas.

Make sure there are no open flames within 25 ft. of propane tanks.

Absolutely no smoking in the propane filling area.

Use the proper PPE (personal protective equipment) for filling tanks i.e. gloves, goggles, and coveralls.

Make sure that there are no leaks on the fuel supply tank, service tanks, or hoses.

### **Operation**

Connect the filling adapter to service tank.

Connect the hose from the fuel supply tank to the service tank.

Open valve on the service tank all the way.

Open valve on the fuel supply tank.

Open vent screw on the side of the service tank approximately ¼ turn.

Let the service tank fill until there is fuel discharge from the vent screw.

**After the tank is full**

First close the vent screw.

Close both the fuel supply valve and the service tank valves.

Open ventilation valve to release any excess gas in the fuel supply line.

Disconnect all connections.

## **TACK MACHINE**

### **Safety**

**Warning:** Make sure that the supply hose and wand are secure during transport.

Propane tanks contain extremely flammable fuel.

Do not smoke in the vicinity of propane tank.

Check propane supply line for chaffing, tears, and cracks.

This machine produces hot asphalt emulsion, and can cause injuries if contacted with the skin.

### **Operation**

Open propane supply valve.

Turn ignition switch to the “ON” position.

When the temperature reaches 150 degrees open both circulation valves.

After desired temperature is reached and both valves are open, start pump.

To start pump place the choke to the “ON” position and pull cord. After pump has started turn choke “OFF” and let pump run.

Let the tack circulate to soften hardened material left in pipes.

To supply tack to the wand, close the top circulation valve, and open the supply valve to the wand.

Circulate through the wand by opening hand valve on the wand.

### **Shutting down the machine**

Close both circulation valves.

Open diesel supply valve.

Flush supply pump until diesel fuel comes through the wand.

Close diesel supply valve (and all other valves).

Turn motor off / close propane supply valve.

## **GAS POWERED POLE SAW**

### **Safety**

Do not cut directly underneath the limbs while cutting.

Use the proper PPE (personal protective equipment) i.e. gloves, helmet.

**Caution:** Cutting chain is extremely sharp and can cause injuries.

Using a pole saw can quickly cause fatigue. Take regular breaks.

### **Operation**

#### **Starting the engine**

Turn the choke to the “ON” position.

Pull the start cord until the engine begins to start.

Turn choke to the “OFF” position.

Pull the start cord until engine runs.

## **HAND HELD CUTTING SAW**

### **Safety**

**Caution:** Never operate without safety guards in place.

Use both hands while operating.

Use the proper PPE (personal protective equipment)

Keep hands away from blade while operating.

**Warning:** This machine emits sparks and may cause fires.

## **Operation**

Turn the START/STOP switch to the start position.

Place the throttle trigger to full and lock into position.

Pull choke out.

Pull the start cord until engine runs.

Pull throttle to release locking device.

## **SMOKE BLOWER**

### **Safety**

**Warning:** Internal combustion engines create heat.

Use the proper PPE (personal protective equipment) i.e. gloves.

Inhaling smoke/exhaust fumes can cause injuries.

Use the proper procedures when lifting. (Use your legs to do the lifting).

### **Operation**

To start engine place the ON/OFF switch to the “ON” position.

Turn the throttle to CHOKE.

Pull the start cord until engine starts.

Turn CHOKE off.

With engine running light a smoke charge, hook to chain and drop into the manhole.

Place boom underneath the plate assembly of the smoker around the rim of the manhole to contain smoke.

## **GAS POWERED SIGN DRIVER**

### **Safety**

**Warning:** Excessive use of this machine can cause carpal tunnel syndrome.

Keep hands on handles at all times when operating.

Use the proper PPE (personal protective equipment) i.e. hearing protection.

Make sure to watch for pinch points between the sign leg, and the driver bit.

### **Operation**

This machine uses mixed gas only!

To start the engine turn START/CHOKE knob to the CHOKE position.

Pull the start cord until engine starts.

With the engine running turn START/CHOKE to START.

## **WEED EATERS**

### **Safety**

Use the proper PPE (personal protective equipment) i.e. hearing protection, goggles, gloves, and steel toed shoes/boots.

Keep hands away from weed eater head while running.

**Caution:** Improper use of this machine can cause injuries, such as loss of limbs.

Only use mixed gas!

Do not use machine if fatigued.

Exhaust fumes can hazardous, or even fatal if inhaled. Use caution.

### **Operation**

To start the engine, place the START/CHOKE lever to the CHOKE position.

Press the fuel prime button 3 to 4 times.

Pull the start cord until engine starts.

Place the START/CHOKE lever to the START position.

## **HOSE RAMPS**

## **Safety**

**Caution:** Sharp points on the bottom of ramps may cut, and cause injury.

Use the proper PPE (personal protective equipment) i.e. gloves.

When connecting watch for pinch points. May injure fingers.

## **Operation**

Place out ramps out in a straight line.

Using steel flanges connect the sections of the ramp and secure with cotter pins.

Lay across roadway.

# **COMPACT POWER UNIT**

## **Safety**

Do not attempt to locate hydraulic leaks by feeling around hoses and fittings with bare hands. "Pin-hole" leaks can penetrate the skin.

Never operate the power unit in a closed space. Inhalation of engine exhaust can be fatal.

Make sure hoses and fittings are undamaged and tight before starting the power unit.

Keep clear of hot engine exhaust.

Never use flammable solvents around the power unit engine.

Clean up oil and fuel spills immediately. Do not overfill fluids.

Always shutdown the power unit engine before performing any maintenance or adjustments on the power unit unless otherwise specified.

Always wear appropriate safety equipment such as goggles, ear protection and toe guards.

Make sure all hoses are connected for correct flow direction to and from the tool being used.

Unauthorized modifications to the power unit may impair the function and/or safety and impair machine life. Use only approved service parts and accessories.

Do not operate the power unit if gasoline odor is present. Check for spilled fuel. Check for fuel leaks.

Keep the power unit at least 3.3ft/1 m away from buildings, obstructions and flammable objects. Do not aim engine exhaust at materials that could catch fire.

Allow the engine to cool before storing the power unit in an enclosure.

Operating the power unit engine at excessive speeds increases the danger of personal injury. Do not change governor setting or tamper with governor components, which may increase the governed engine speed.

When servicing the power unit engine always remove a spark plug wire to prevent accidental starting.

Keep all fasteners tight to be sure the power unit is in a safe working condition.

## **Operation**

### **Wheeling the machine**

The power unit is equipped with retractable handle bars so the power unit can be easily wheeled at the job site.

The bars should be pushed into the stowed position during operation so the dash panel is fully accessible.

To wheel the power unit, pull each bar straight out until the bar locking mechanism engages. This locks the bar in the extended position.

### **Throttle control**

The throttle control permits the operator to select one of three operating modes while the engine is running and after it has warmed up.

The throttle control permits the operator to select one of three operating modes while the engine is running and after it has warmed up.

- **Auto.** Engine speed varies with hydraulic circuit pressure to maintain a constant 8gpm/30 lpm flow for operating H.T.M.A type 2 tools. At circuit high pressure “TOOL ON”, engine speed increases and at circuit low pressure “TOOL OFF” engine speed returns to idle.
- **Hold 5 gpm.** Engine speed holds constant, whether or not circuit pressure is low, to produce a steady 5gpm/19 lpm flow for operating H.T.M.A type 1 tools and prevent tool overflow/over speed.
- **Hold 8 gpm.** Engine speed holds constant to produce a steady 8gpm/30lpm flow for operating H.T.M.A type 2 tools. Used where full flow to the tool is required even though pressure demand is low.

Typical conditions requiring the hold 8 gpm/30 lpm mode are:

- When operating alternator, fluid flow must be constant at 8 gpm/30 lpm to produce the required voltage and frequency, even when load requirements are light.
- When operating small drills or during light grinding operations, tool RPM must be maintained, even though load requirements are light.
- When using a pump, the power required drops when the water is removed from the sump and the pump is just maintaining the water level.

## **Startup**

Place the hydraulic circuit control lever in the “TOOL OFF” position.

**Important:** Always return the throttle control to “AUTO” or disconnect position to allow the automatic throttle to control engine speed during startup. The control link engaged in the hold 8 or 5 gpm position when starting the engine increases engine speed too soon before warm-up; this can cause engine and hydraulic pump damage.

Select the “AUTO” throttle operating mode by positioning the governor lever so the guide hole aligns with the appropriate hole in the cylinder lever, then insert the faspin.

**Important:** Do not start the engine with the throttle control set at 8 gpm.

Place the ENGINE ON/OFF switch in the “ON” position.

Place the hydraulic circuit control lever in the “START” position. Engage the choke, if necessary, to start the engine.

When the engine starts, release the hydraulic circuit control lever to the “TOOL OFF” position. Allow the engine to warm up until it runs smoothly with the choke released.

Once the engine has warmed up, select a mode of operation:

- **Auto.** This is the normal mode of operation for most tools used.
- **Hold 8/5 gpm.** Remove the faspin and position the governor lever so the 8 or 5 hole aligns with the corresponding hole in the stop bracket, then insert the faspin.

**Important:** “TOOL OFF” position before connecting or disconnecting hoses at the tool. Tools used with the power unit must be designed for operation with open center systems.

Connect the hoses to the tool. Make sure all hoses are tightened securely to the fittings at the tool and power unit.

With the engine running smoothly without the choke, move the control lever to the “TOOL ON” position.

When the tool trigger is pressed hydraulic pressure increases and the automatic throttle increases speed to a level that produces an 8 gpm/30 lpm flow for operating H.T.M.A type 2 tools.

When the tool trigger is released hydraulic pressure decreases and the automatic throttle lowers the engine speed to reduce noise and save fuel.

### **Shutdown**

**Important:** Always remove the faspin from the hold 8 or 5 position before shutting down the engine. Stopping the engine with a hold control engaged can cause the exhaust system to load with gasoline during COAST DOWN. This can cause damaging exhaust BACKFIRE. If the engine is cold, rapid THROTTLE UP pump cavitations may damage the pump.

Position and pin the throttle control linkage in the “AUTO” position.

Place the hydraulic circuit control lever in the “TOOL OFF” position.

Place the ENGINE ON/OFF switch in the “OFF” position.

## **STAND UP VACUUM CLEANER**

### **Safety**

The vacuum cleaner must not be used in a corrosive or explosive environment.

Keep the vacuum cleaner free from external elements such as wastes, oil, tools and other objects that could damage its function and cause personal injury.

Avoid use of toxic or inflammable solvents and their vapors. Avoid using near open flames or heat sources; ensure adequate ventilation.

Never use the vacuum cleaner without the filter.

Do not breathe petroleum products or inflammable liquids in general.

Ensure that all protection equipment and guards are in place and that all safety devices are present and operating.

Do not use the vacuum cleaner on non-level or inclined surfaces.

Do not wear loose or flowing apparel such as ties, scarves or torn clothing that could become hung or caught up by the vacuum cleaner.

Do not open the waste collection container while the vacuum cleaner is in use.

Never move the vacuum cleaner by pulling it by the electrical supply cord.

Do not climb on the vacuum cleaner.

Do not touch electrical wires, switches, buttons, etc. with wet hands.

Before connecting to the electrical power current ensure that the voltage and supply frequency are those indicated on the machine's plate.

Connect the electrical supply to an adequately grounded line.

Periodically check the condition of the power supply cord. If the cord shows signs of usage it will be necessary to replace it immediately. An electrical technician must only perform this task.

If an extension cord is used, make sure that it is in perfect condition, is EEC marked and the cable diameter is adequate for the electrical power consumption of the vacuum cleaner.

During clean-up after use the employees in charge must check that the vacuum cleaner has been returned to its usual safe working condition, particularly with regard to the safety devices and protection guards pertinent to use.

Use of the vacuum cleaner is restricted to adults.

Never insert hands between the waste container and the vacuum cleaner during the locking phase. Perform the locking procedure using the special lever and BOTH HANDS.

During use, always stabilize the vacuum cleaner using the special brake located on the turning wheel.

## **Operation**

Check that the power supply plug is correctly inserted in the socket.

Check that the flexible tube is correctly inserted and locked into the suction mouthpiece.

Check that the waste collection container is in place and locked onto the vacuum cleaner.

Check that the power supply cable and extension cord (if used) are intact and in perfect working order.

Stabilize the vacuum cleaner using the lever found on the turning wheel.

Attach the hose vacuum accessory to the end of the flexible tube.

Push the button that starts the first motor.

The second and third motor may be started, for more suction power.

Push the above-mentioned buttons again to stop the vacuum cleaner.

When the work is finished, disconnect the vacuum cleaner from the socket.

### **Cleaning the filter**

Stop the vacuum cleaner by pushing the START/STOP button(s) of the motors in use.

Lower the lever locking the push rod.

Quickly raise and lower the knob repeatedly to shake the filter inside.

Lock the push rod again by lifting the special lever and then return to vacuuming.

### **Emptying the waste container**

Depending on the quantity and type of material being vacuumed, the inside of the waste container must be frequently checked to avoid overflow.

To empty the container:

Stop the vacuum cleaner using the START/STOP buttons of the motors in use.

Stabilize the vacuum cleaner using the special brake located on the turning wheel.

Unlock the container by raising the special lever.

Remove the waste container from the vacuum cleaner using the special handle.

Empty the waste inside the container into an appropriate container for waste disposal according to the laws in vigor of the country where the vacuum cleaner is being used.

### **Inserting and locking the waste container**

Insert the waste container inside the vacuum cleaner.

Lower the container's locking lever completely, using both hands.

The studs located on both sides, must be aligned with the grooves.

# **WATER PUMPS**

## **Safety**

To prevent fire hazards and to provide adequate ventilation, keep the pump at least 3ft away from buildings and other equipment during operation.

Do not place flammable objects such as gasoline, matches, etc., close to the pump while it is running.

Refuel in a well-ventilated area with the pump stopped. Gasoline is flammable and explosive under certain conditions.

Do not overfill the tank. There should be no fuel in the filler neck. Make sure that the filler cap is closed securely.

If any fuel is spilled, clean it up completely before starting the engine.

Do not smoke or allow flames or sparks where the pump is refueled or where gasoline is stored.

Exhaust contains poisonous carbon monoxide gas. Avoid inhalation of exhaust gases. Never run the pump in a closed garage or confined area.

Operate the pump on a level surface. If the engine is tilted, fuel spillage may result.

Nothing should be placed on the engine. It will cause fire hazards.

A spark arrester is provided as an optional part for this pump. It is illegal in some areas to operate an engine without a spark arrester. Check local laws and regulations before operating.

Know how to stop the pump quickly and understand operation of all the controls. Never permit anyone to operate the pump without proper instructions.

Keep children and pets away from the pump when it is in operation.

Keep away from rotating parts while the pump is running.

## **Operation**

### **Starting the engine**

Turn the fuel valve ON.

Close the choke lever.

**Note:** If the engine is warm or the ambient temperature is high, open the choke lever as soon as the engine starts.

Turn the engine switch to the ON position.

Move the throttle lever slightly to the right.

Pull the starter grip lightly until resistance is felt, then pull it briskly.

**Caution:** Do not allow the starter grip to snap back against the engine. Return it gently to prevent damage to the starter.

As the engine warms up, gradually open the choke

Set the throttle at the desired speed.

### **Stopping the engine**

**Note:** In an emergency, turn the engine switch to the OFF position immediately.

Move the throttle lever fully to the left.

Turn the engine switch to the OFF position.

Turn the fuel valve OFF.

## **GAS POWERED GENERATOR**

### **Safety**

Place the generator at least 3ft away from buildings or other equipment during operation.

Operate the generator on a level surface. If the generator is tilted, fuel spillage may report.

Exhaust gas contains poisonous carbon monoxide. Never run the generator in an enclosed area.

Be sure to provide adequate ventilation.

Know how to stop the generator quickly and understand operation of all the controls. Never permit anyone to operate the generator without proper instructions.

Keep children and pets away from the generator when it is in operation.

Keep away from rotating parts while the generator is running.

The generator is a potential source of electrical shocks when misused; do not operate with wet hands.

Do not operate the generator in rain or snow and do not let it get wet.

Connections for standby power to a building's electrical system must be made by a qualified electrician and must comply with all applicable laws and electrical codes. Improper connections can allow electrical current from the generator to back feed into the utility lines. Such back feed may electrocute utility company workers or others who contact the lines during a power outage, and when utility power is restored, the generator may explode, burn, or cause fires in the building's electrical system.

When charging a battery:

Battery electrolyte contains sulfuric acid. Protect your eyes, skin and clothing. In case of contact, flush thoroughly with water and get prompt medical attention, especially if your eyes are affected.

Batteries generate hydrogen gas, which can be highly explosive. Do not smoke or allow flames or sparks near a battery, especially during charging.

### **Starting engine**

Disconnect any load from the DC terminals and make sure that the AC circuit breaker is in the OFF position.

Turn on the fuel valve.

Turn on the engine switch

Move the choke lever to the CLOSED position.

Pull the starter rope lightly until resistance is felt, then pull briskly.

**Caution:** Do not allow the starter grip to snap back. Return it slowly by hand.

**Note:** Make sure the pilot lamp comes on. If not, check the bulb filament.

Move the choke lever to the OPEN position as the engine warms up.

### **Oil alert**

Before the oil level in the crankcase can fall below a safe limit, the oil alert system will automatically shut off the engine. The oil alert lamp will light when the recoil starter grip is pulled.

To restart, add enough recommended engine oil to bring the oil level to the upper level mark on the dipstick.

**Note:** The engine switch will remain in the ON position if the engine is stopped by the oil alert system.

### **Generator use**

**Warning:** To prevent electrical shock from faulty appliances, the generator should be grounded. Connect a length of heavy wire between the generator's ground terminal and an external ground source.

Connections for standby power to a building's electrical system must be made by a qualified electrician and must comply with all applicable laws and electrical codes. Improper connections can allow electrical current from the generator to back feed into the utility lines. Such back feed may electrocute utility company workers or others who contact the lines during a power outage, and when utility power is restored, the generator may explode, burn, or cause fires in the building's electrical system.

**Caution:** Limit operation requiring maximum power.

### **AC applications**

Start the engine and make sure the pilot lamp comes on. If not, check the filament.

Switch on the AC circuit breaker.

**Note:** Although voltage adjustment is usually not required, fine adjustments may be made by turning the voltage adjustment knob. Use the generator at the specified voltage (120V).

Plug in the appliance and always three-pronged plugs.

**Caution:** Be sure that appliances do not exceed the generators rated load capacity for more than 30 minutes and that they never exceed the maximum load capacity. Substantial overloading will switch off the circuit breaker. Marginal overloading may not switch off the circuit breaker, but it will shorten the service life of the generator.

Be sure that all appliances are in good working order before connecting them to the generator. If an appliance begins to operate abnormally, becomes sluggish, or stops suddenly, turn off the circuit breaker and the generator engine switch immediately. Then disconnect the appliance and examine it for signs of malfunction.

**Note:** If an overloaded circuit causes the AC circuit breaker to switch off, reduce the electrical and on the circuit and wait a few minutes before resetting the circuit breaker.

### **DC applications**

The DC terminals may be used for charging 12 volt automotive-type batteries only.

**Warning:** Batteries produce explosive gases. Keep sparks, flames, and cigarettes away. To prevent the possibility of creating a spark near the battery, connect charging cables first to the battery, then to the generator, and disconnect cables at the generator first.

**Caution:** Do not attempt to start an automobile engine while the generator is still connected to the battery. The generator may be damaged.

Connect the positive battery terminal to the positive generator terminal. Do not reverse the charging cables, or serious damage to the generator and/or battery may occur.

**Note:** The DC terminals may be used while the AC power is in use.

An overloaded DC circuit will trip the DC circuit protector. If this happens, wait a few minutes before pushing in the circuit protector to resume operation.

### **Stopping the engine**

Turn off the AC circuit breaker and disconnect any charging leads at the DC terminals.

Turn the engine switch to the OFF position.

Turn the fuel valve to the OFF position.

## **GAS POWERED HEDGE TRIMMER**

### **Safety**

Because a hedge trimmer is a high-speed, fast-cutting power tool, special safety precautions must be observed to reduce the risk of personal injury.

**Warning:** The use of any hedge trimmer may be hazardous. If the cutting tool comes in contact with your body, it will cut you.

Striking solid foreign objects such as stones, fence wire or metal could damage the cutting attachment and may cause blades to crack, chip or break.

**Warning:** The operator is responsible for avoiding injury of third parties and damage to their property.

Never let the hedge trimmer run unattended.

Safe use of a hedge trimmer involves

1. The operator
2. The hedge trimmer
3. The use of the hedge trimmer

Prolonged use of a hedge trimmer exposing the operator to vibrations may produce white finger disease or carpal tunnel syndrome. These conditions reduce the hand's ability to feel and regulate temperature, produce numbness and burning sensations and may cause nerve and circulation damage and tissue necrosis.

All factors which contribute to white finger disease are not known, but cold weather, smoking and diseases or physical conditions that affect blood vessels and blood transport, as well as high vibration levels and long periods of exposure to vibration are mentioned as factors in the development of white finger disease. In order to reduce the risk of white finger disease and carpal tunnel syndrome, please note the following.

- Wear gloves and keep your hands warm.
- Maintain firm grip at all times, but do not squeeze the handles with constant, excessive pressures, take frequent breaks.

All the above mentioned precautions do not guarantee that you will not sustain white finger disease or carpal tunnel syndrome. Therefore continual and regular users should monitor closely the condition of their hands and fingers. If any of the above symptoms appear, seek medical advice immediately.

**Warning:** The ignition system of your unit produces an electromagnetic field of a very low intensity. This field may interfere with some pacemakers. To reduce the risk of serious or fatal injury, persons with pacemaker should consult their physician.

### **Proper clothing**

Hedge trimmer operation can cause serious injury to eyes, ears and person. Therefore, to reduce the risk of injury to your eyes never operate a hedge trimmer unless wearing goggles or properly fitted safety glasses with adequate top and side protection.

**Warning:** Hedge trimmer noise may damage your hearing. Wear sound barriers to protect your hearing. Continual and regular users should have their hearing checked regularly.

Wear proper protective clothing. Clothing must be sturdy and snug-fitting, but allow complete freedom of movement. Avoid loose-fitting jackets, scarfs, neckties, jewelry, flared or cuffed pants, unconfined long hair or anything that could become caught on branches, brush or moving parts of the unit. Wear long pants made of heavy material to protect your legs. Do not wear shorts.

Protect your hands with gloves when handling the hedge trimmer and the cutting too. Heavy-duty, non-slip gloves improve your grip and help to protect your hands.

Good footing is most important in hedge trimmer work. Wear sturdy boots with non-slip soles. Steel toed safety boots are recommended.

Wear an approved safety hard hat to reduce the risk of injury to your head when there is a danger of head injuries.

**Warning:** Never modify a hedge trimmer in any way. Use on manufacturer's attachments.

## **Operation**

**Warning:** To reduce the risk of injury from blade contact, do not attempt to "drop start" the trimmer.

Place the hedge trimmer on firm ground or other solid surface in an open area. Maintain a good balance and secure footing. To reduce the risk of injury from blade contact or loss of control always engage the starting lock before starting. When the engine starts at starting-throttle, engine speed will be fast enough for the clutch to engage and move the cutting tool. When you pull the starter grip, don't wrap the starter rope around your hand. Do not allow the grip to snap back, but guide the starter rope to rewind properly. Failure to follow this procedure may result in injury to hand or fingers and may damage the starter mechanism.

To reduce the risk of injury from inhalation of poisonous fumes, operate and start the hedge trimmer only outdoors in ventilated area. Hold the hedge trimmer in such a way that you do not breathe in the exhaust fumes. Operate the hedge trimmer under good visibility and daylight conditions only. Work carefully. Take particular care in slippery conditions and on slopes. Be careful on uneven ground. Watch out for stumps, roots, ditches or holes, which could cause you to trip or stumble. Before you start work, examine the hedge area for stones, fence wire, metal or other solid objects, which could damage the cutter blades.

## **WEED SPRAYER**

### **Safety**

Keep this sprayer, and all compounds used in it, out of reach of children.

Do not point the gun at anyone or at any part of the body. Fluids under pressure can penetrate the skin and serious injury could result.

Make sure that you have proper ventilation when using any sprayer in a confined area. If necessary, wear breathing protection or assistance devices. Consult spray solution supplier for product cautions.

Safety clothing and face protection should be worn when using the sprayer. Consult spray solution supplier for product cautions.

Read spray solution manufacturer's labels twice when purchasing and before using. Observe all warnings carefully. Failure to do so could result in exposure to toxic chemicals. Dispose of empty container per label instructions.

Before disconnecting spray tip from gun or gun from hose, turn off the sprayer and relieve the pressure in the line.

Never use your mouth to blow out nozzle tips.

Do not pull the spray unit by its hose. Protect the hose from vehicular traffic and sharp objects. Do not use hose if damaged.

If you are using hose and accessories equipped with quick couplers, be certain coupler has locked before applying pressure.

Do not spray solution near electrical components of sprayer or electrical fixtures on buildings or other equipment in area as electric shock may result.

Spraying solution temperature must not exceed 130 degrees.

Do not spray flammable liquids with the sprayer.

Do not alter equipment in any manner. If repairs are necessary, use only genuine factory repair parts supplied by a local component supplier.

Do not operate the shut-off gun if there are any leaks from the packings, fittings, hoses, etc.

If you must leave the sprayer unattended, shut off the unit, disconnect from power source, relieve pressure in system and position trigger lock in "locked" position.

**Warning:** Do not exceed maximum pressure and temperature of lowest rated accessory used on the sprayer.

## **Operation**

Before using sprayer, be certain all threaded connections are tight. Check that the shut-off gun trigger lock works properly. Check that drain plugs are in place and tight. If quick couplers are used on any fittings, be certain they are locked.

If you are uncertain what spraying solution was previously used, whether the unit was drained and cleaned, or if the sprayer has been freeze protected, clean the tank and all accessories before using.

If you will be spraying a solution that must be diluted or mixed with other compounds, premix the spraying solution in a suitable container before filling the tank.

Fill the solution tank with the spraying solution.

Replace vented lid and hand tighten.

Press power rocker switch to “ON”.

Spray. (Rotate barrel of cone jet tip to desired spray setting.)

**Note:** Many spraying solutions require application at specified rates for specified results. Over application may expose operator and environment to chemical hazards.

When you have emptied the solution tank or are moving to a new location, press rocker switch to “OFF” and relieve all pressure in the system.

### **Shutdown**

Press power rocker switch to “OFF”.

Trigger shut-off the gun to relieve all pressure in the system.

If not all of the spraying solution was used up drain remainder into suitable container by removing drain plug from either end of the tank. Follow supplier’s recommendations for disposal. If you will be cleaning the sprayer, choose a location that will not endanger animals, people, or the environment.

Spray inside of solution tank with clean water from a garden hose and let it drain into a suitable container. Replace drain plug. Properly dispose and rinse with water.

Add clean water to solution tank and press power rocker switch to “ON”. Run sprayer to clean pump, hose and gun or accessory. Cease when water comes out clear. Press rocker switch to “OFF”. Relieve pressure in the system.

Remove, clean and replace inline filter.

Wash exterior of the sprayer with soap and water, rinsing thoroughly. Also rinse hose, gun and accessories.

### **General spraying techniques**

Please note that most insecticides are sensitive to “alkaline hydrosis”, which means that they break down more rapidly in water, which is more basic than neutral. Most formulations have an acidifying agent, which will enable the material to buffer moderately alkaline water. Check you water PH periodically

and experiment with acidifying agents if your PH consistently measures greater than 8.0. Or use water treated by water softener.

Under certain circumstances, such as light level and direction and matter being sprayed, the operator may be unable to tell where he just sprayed. The result is a wasteful overlap or an annoying miss.

## **PLATE WACKER**

### **Safety**

Do not use equipment in applications for which it is not intended.

Do not use improperly trained personnel to operate equipment.

Always read and understand instruction book procedures before operating equipment.

Always operate with safety devices in place and in working order.

Always be sure operator is familiar with safety and operating procedures before using equipment.

Do not smoke while operating machine.

Do not leave running machine unattended.

Always be sure machine will not tip over, roll, slide, or fall while unattended.

Always turn engine "OFF" when leaving machine unattended.

Do not refuel hot or running engine.

Do not spill fuel when refueling.

Do not smoke when refueling.

Do not refuel near open flame.

Always replace safety devices removed during service or repair before operating.

Always replace safety devices removed during service or repair before operating.

Always wear protective clothing called for when operating.

Always keep hand, feet, and clothing clear of moving parts.

### **Operation**

**Before starting**

Check engine oil.

Check air cleaner.

Check Fuel level.

**To start**

Open the fuel valve.

Close the choke.

Turn engine switch to “ON”.

Move throttle slightly to the left.

Pull starter rope.

Open choke as engine warms.

Open throttle fully to operate.

**To stop**

Move throttle fully to the right.

Turn engine switch to “OFF”.

Close the fuel valve.

## **WALK BEHIND PAINT MACHINE**

**Safety**

Always use the proper PPE (Personal Protective Equipment) i.e. gloves, eye, and ear protection.

Do not use this equipment in a confined space.

Make sure that there is adequate ventilation in your work area.

This machine produces paint and exhaust fumes. If inhaled for long periods of time it may cause injury or even death.

**Caution:** When using the cleaning solvent to flush the system, make sure that you read the MSDS before use.

Keep open flames, or heat sources away from the machine, and cleaning solvents.

### **Starting the engine**

Place the RUN/STOP switch in the RUN position.

Prime the engine by pushing the prime button 3-5 times.

Place the choke in the ON position.

Pull the start cord.

When the engine starts let it run for 5 seconds before turning the choke off.

### **Operation**

Place the suction tube in the top of the paint can.

Align the machine by pulling the lever on the left handle, unlocking the front tire pin.

When aligned pull the right lever halfway open for a single spray gun

Pull the lever to the full position for the double spray gun.

### **Cleaning the machine**

When painting is complete replace the paint can with a can of solvent.

Place the suction tube in the top of the can.

Flush the system that was in use i.e. single gun, double guns.

Only flush in a designated chemical disposal area.

## **MAINTENANCE OPERATING PROCEDURES**

### **Traffic Operations**

**Stop/Street sign installation and maintenance**

Sign installations is coordinated through engineering, street foreman is responsible for scheduling installation. Street division will install all STOP signs to meet or exceed MUTCD and Engineering standards.

During new development it shall be the responsibility of the developer to provide all signs that are required per the plans and engineering standards **except** for street signs. Developer is responsible for delivering signs and hardware to street division. Street foreman will schedule and have signs installed.

Street division will **bill developer for the cost of the material fabrication and installation material only** for street signs. Street division is not to provide any hardware for sign installation except for mounting brackets for street signs at the expense of the contractor

At anytime a stop sign has been reported or noticed to have damage street crew will correct problem immediately.

All stop signs are checked annually for the following:

- Reflectivity
- Visibility
- Condition
- Clear view issues

All repairs or new installations shall be added to the inventory database by the street foreman.

### **Stop Line Pavement Markings**

Follow Section 3B.16 in the MUTCD and Engineering Standards. Although pavement markings are not required at all stop sign location, for further traffic safety precautions the City has decided to install pavement marking at all stop signs.

All stop line pavement markings are painted on an annual basis.  
All fog line pavement markings are painted on an annual basis.

### **Alley Stop Signs**

In General, the right of way at alley intersections is given to the through streets. Vehicles entering roadway from an alley must yield to vehicles in the roadway. The need for stop or yield signs will be evaluated based on the MUTCD guidelines and engineering judgment.

### **Signal Outages**

Report any signal interruptions to WASHDOT. Placement of temporary STOP signs should only be considered when it is determined that flashing mode cannot

be restored within 24 hours. The street department will be responsible for placing the signs if needed.

### **Street Lights**

Report any street light outages to PSE

### **Alley Maintenance**

Alleys are graded or cut when needed. Materials used on alley are 5/8 crushed quarry, 1-1/4" crushed quarry, and asphalt grindings. When needed vegetation in alleys are trimmed back out of the city right of way. Alleys are inspected annually for the following

- Potholes
- Overgrowth of vegetation
- Debris

### **Street Maintenance**

Potholes are filled with cold mix when reported to or noticed by street division. During spring and summer street division shall place hot mix in problem areas. During dry dusty months city will provide dust control measures to gravel streets **AT CURENT TIME NO DUST CONTROL MEASURES WILL BE TAKEN ON GRAVEL ALLEYS.**

### **Sidewalk Maintenance**

Street division is responsible for spraying of vegetation growing in and around sidewalks and curbs. Street division will grind trip hazards found or reported to minimize cost. If grinding sidewalk does not eliminate problem if possible city will pull area of concern and replace. In the event of a trip accident street foremen shall make a complete report of the incident and pass on to the Operation Secretary.

### **Sidewalk Replacement Installation Policy**

- **Existing Sidewalk**  
When there is an existing sidewalk in need of repair, the City will remove. Form up and pour a new sidewalk. City will provide the labor and the homeowner will pay for the materials.
- **Existing Curb and No sidewalk**  
When there is an existing curb and no sidewalk, the City will provide labor install a new sidewalk, the homeowner will pay for the materials.

- **No Existing Curb or Sidewalk**  
When there is no existing curb or sidewalk, the City **will not** provide labor to install sidewalks.

## **Guardrail Operations & Maintenance**

### **Construction:**

Coordinated through engineering, construction will be by Skagit County or through contracted effort.

### **Maintenance:**

The Street Division will be responsible for guardrail maintenance. Guardrails are to be inspected annually for the following:

- Missing bolts
- Rail damage
- Post damage/deterioration
- Visibility
- Any defect
- Vegetation overgrowth

All inspection notes are to be logged into the street database.

### **Repairs:**

Any repairs found from the annual inspection are prioritized by the street foreman and scheduled for repair. Any repairs that can not be performed by the maintenance staff will be contracted through a contractor or Skagit County.

### **New Guardrail:**

An engineering study shall precede installation of any new guardrail. New guardrails shall be added to the inventory by the street foremen and inspected annually.

## **Sewer/Storm Maintenance**

### **Existing Infrastructure:**

- Video inspection crew will clean and inspect all sewer/storm lines in an orderly fashion.
- Supervisor will be responsible for scheduling assigned routes to be inspected or cleaned.

- Problem areas will be monitored until repairs are made.
- Small repairs will be made crew. Larger repairs with assistance from the engineering department will be contracted out.
- Video request are handled in the form of a service request (service request must have district and manhole numbers from point to point).
- Supervisor schedules video inspections.
- Video inspection crews are to report all findings to supervisor.
- Supervisor is to report all findings to requestor.

Video Inspection of New Installations for Sewer & Storm:

- Contractor gets a video inspection request form from the City Inspector.
- Form needs to be filled out completely and signed by the City Inspector.
- Form is to be delivered to the City Operations Office located at 2201 37<sup>th</sup> St.
- Completed form is forwarded to the Street Dept Supervisor.
- The supervisor makes contact with the contractor to schedule the video inspection.
- Supervisor assigns/schedules inspection to video crew.
- Inspection crew does a pre-walk through of jobsite prior to initial inspection (to insure adequate access for equipment).
- If jobsite is satisfactory and safe video inspection crew will begin inspection process.
- Upon completion inspection crew is to report all findings to supervisor.
- Supervisor informs project manager of findings.
- All hard copies of reports are to be forwarded to the project manager.