



OPERATOR MANUAL

MODELS/MANUAL: TR24, TR34

MODELS/REMOTE: TR24, TR34



BULLDOG TRENCH ROLLER

A 100% employee-owned American manufacturer

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Bulldog®

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FOREWORD

These instructions include:

- Safety regulations
- Operating instructions
- Maintenance instructions

These instructions have been prepared for operation on the construction site and for the maintenance engineer.

These instructions are intended to simplify operation of the machine and to avoid malfunctions through improper operation.

Observing the maintenance instructions will increase the reliability and service life of the machine when used on the construction site and reduce repair costs and downtimes.

Always keep these instructions at the place of use of the machine.

Only operate the machine as instructed and follow these instructions.

Observe the safety regulations as well as the guidelines of the civil engineering trade association. Observe the safety rules for the operation of road rollers and compactors and the pertinent regulations for the prevention of accidents.

Stone Construction Equipment, Inc. is not liable for the function of the machine when used in an improper manner or for other than the intended purpose.

Operating errors, improper maintenance and the use of incorrect operating materials are not covered by the warranty.

The above information does not extend the warranty and liability conditions of business of Stone Construction Equipment, Inc.

Warranty Information

Please enter the following data. This will help expedite any service or warranty work.

1. Machine Type: _____

Machine S/N: _____

2. Engine Type: _____

Engine S/N: _____

3. VIN: _____

4. Purchase Date: _____

5. Dealer/Distributor Information:

Name: _____

Address: _____

Phone #: _____

Fax #: _____

Location of above information:

1. Information on S/N tag.
2. Information on engine tag.
3. Information on S/N tag - if applicable.
4. Date you purchased machine.
5. Dealer machine was purchased from.

Stone Construction Equipment, Inc.
P.O. Box 150, Honeoye, New York 14471
Phone: (800) 888-9926
Fax: (716) 229-2363

Limited Warranty

The Manufacturer warrants that products manufactured shall be free from defects in material and workmanship that develop under normal use for a period of 90 days for concrete vibrators and electric pumps, one year for Rhino®, Bulldog®, Wolfpac Rollers™, trowels, Stompers®, saws, forward plates, engine powered pumps, and 6 months for all other products from the date of shipment. The foregoing shall be the exclusive remedy of the buyer and the exclusive liability of the Manufacturer. Our warranty excludes normal replaceable wear items, i.e. gaskets, wear plates, seals, O-rings, V-belts, drive chains, clutches, etc. Any equipment, part or product which is furnished by the Manufacturer but manufactured by another, bears only the warranty given by such other manufacturer. (The Manufacturer extends the warranty period to "Lifetime" for the drum bearings and seals for the mortar mixers, and agrees to furnish, free of charge, the bearings and seals only upon receipt of the defective parts. The warranty is two years for eccentric bearings on the forward plate compactors, mortar and plaster mixer drums, trowel gearboxes and five years on the Bulldog trench roller eccentric bearings.) A Warranty Evaluation Form must accompany all defective parts. Warranty is voided by product abuse, alterations, and use of equipment in applications for which it was not intended, use of non-manufacturer parts, or failure to follow documented service instructions. The foregoing warranty is exclusive of all other warranties whether written or oral, expressed or implied. No warranty of merchantability or fitness for a particular purpose shall apply. The agents, dealer and employees of Manufacturer are not authorized to make modification to this warranty, or additional warranties binding on Manufacturer. Therefore, additional statements, whether oral or written, do not constitute warranty and should not be relied upon.

The Manufacturer's sole responsibility for any breach of the foregoing provision of this contract, with respect to any product or part not conforming to the Warranty or the description herein contained, is at its option (a) to repair, replace or refund such product or parts upon the prepaid return thereof to location designated specifically by the Manufacturer. Product returns not shipped prepaid or on an economical transportation basis will be refused (b) as an alternative to the foregoing modes of settlement - the Manufacturer's dealer to repair defective units with reimbursement for expenses, except labor, and be reviewed with the Manufacturer prior to repair. A Warranty Evaluation Form must accompany all warranty claims.

Except as set forth hereinabove and without limitation of the above, there are no warranties or other affirmations which extends beyond the description of the products and the fact hereof, or as to operational efficiency, product reliability or maintainability or compatibility with products furnished by others. In no event whether as a result of breach of contract or warranty or alleged negligence, shall the Manufacturer be liable for special or consequential damages including but not limited to: Loss of profits or revenues, loss of use of the product or any associated product, cost of capital, cost of substitute products, facilities or services or claims of customers.

No claim will be allowed for products lost or damaged in transit. Such claims should be filed with the carrier within fifteen days.

Effective April 1, 1998.



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www.stone-equip.com • e-mail: sceny@mcimail.com

1. TECHNICAL DATA

1. TECHNICAL DATA

Bulldog®



1.1 - Stone Bulldog® - Specifications

Model Type	TR24	TR34
Operating Weight lbs (kg)	2,900 lbs (1318 kg)	3,100 lbs (1406 kg)
L x W x H in (cm)	66 x 34 x 46.4 in (167.7 x 86 x 119 cm)	66 x 34 x 46.4 in (167.7 x 86 x 118 cm)
Drum Diameter in (cm)	19.7 in (50 cm)	19.7 in (50 cm)
Drum Width in (cm)	24 in (61 cm)	34 in (86.4 cm)
Engine hp (kw)	20 hp Hatz (15 kw)	20 hp Hatz (15 kw)
Operating Speed RPM (Hz)	Up to 2,800 RPM (46.6 Hz)	Up to 2,800 RPM (46.6 Hz)
Driving & Steering	Hydrostatic	Hydrostatic
Hydraulic Reservoir gal (l)	13 gal (49 l)	13 gal (49 l)
Fuel Tank Capacity gal (l)	3 gal (11.5 l)	3 gal (11.5 l)
Vib Frequency vpm (Hz)	2,000 vpm (33.3 Hz)	2,000 vpm (33.3 Hz)
Centrifugal Force lbs (kN)	15,709 lbs (69.87 kN)	15,709 lbs (69.87 kN)
Total Applied Force lbs (kN)	18,609 lbs (82.7 kN)	18,809 lbs (83.7 kN)
Static Linear Pressure PSI (N/cm)	60.4 PSI (105 N/cm)	48 PSI (85 N/cm)
Dynamic Linear Pressure PSI (N/cm)	327 PSI (572 N/cm)	247 PSI (432 N/cm)
Total Applied Linear Pressure PSI (N/cm)	387.7 PSI (677 N/cm)	295 PSI (516 N/cm)
Static Padfoot Pressure PSI (N/cm)	136.8 PSI (94.34 N/cm)	73.06 PSI (516 N/cm)
Dynamic Padfoot Pressure PSI (N/cm)	740 PSI (510 N/cm)	370 PSI (127.85 N/cm)
Total Applied Padfoot Pressure PSI (N/cm)	876.8 PSI (604.7 N/cm)	443.30 PSI (647.5 N/cm)
Gradeability:	With Vib On With Vib Off	45% 55%
Travel Speed:	Hi Without Vib Low With Vib	136 ft/min (41.5 m/min) 68 ft/min (20.7 m/min)
Maximum Lift in (cm)	27 in (10.62 cm)	27 in (68.6 cm)
Tip Angle	42°	43°
Productivity sq ft/hr (sq m/hr)	8,160 sq ft/hr (758 sq m/hr)	10,798.47 sq ft/hr (1,003.5 sq m/hr)

Standard Features Include: internal and external drum scrapers, drum covers, lift eye, dry element air filter, hydraulic oil sight gauge, electric start, zero-turning radius, zero edge clearance, Snap-Tek™ electronic connection system.

Optional Features: Snap-Tek™ radio-frequency remote control kit, test port gauge kit.

1. TECHNICAL DATA

Machine Data & Machine Sound Level Values

1.2 ENGINE SPECIFICATIONS

Engine Type	2-cylinder, 4-cycle, air-cooled, diesel
Engine Make	Hatz
Engine Model	2G40
Power @ 3000 RPM	20 HP (15 kW)
Operating Speed	2800 RPM
Alternator	12 Volt 15 Amp
Battery	12 Volt System Battery BCI Group 55
Air Cleaner	2-stage centrifugal - Donaldson
Fuel Filter	Water separator type - Hatz
Fuel Type	No. 2 diesel fuel
Fuel Tank Capacity	3 gallons (11.5 liters)
Fuel Consumption	.375 lbs./HPH @ 2850 RPM

1.3 LUBRICATION SPECIFICATIONS

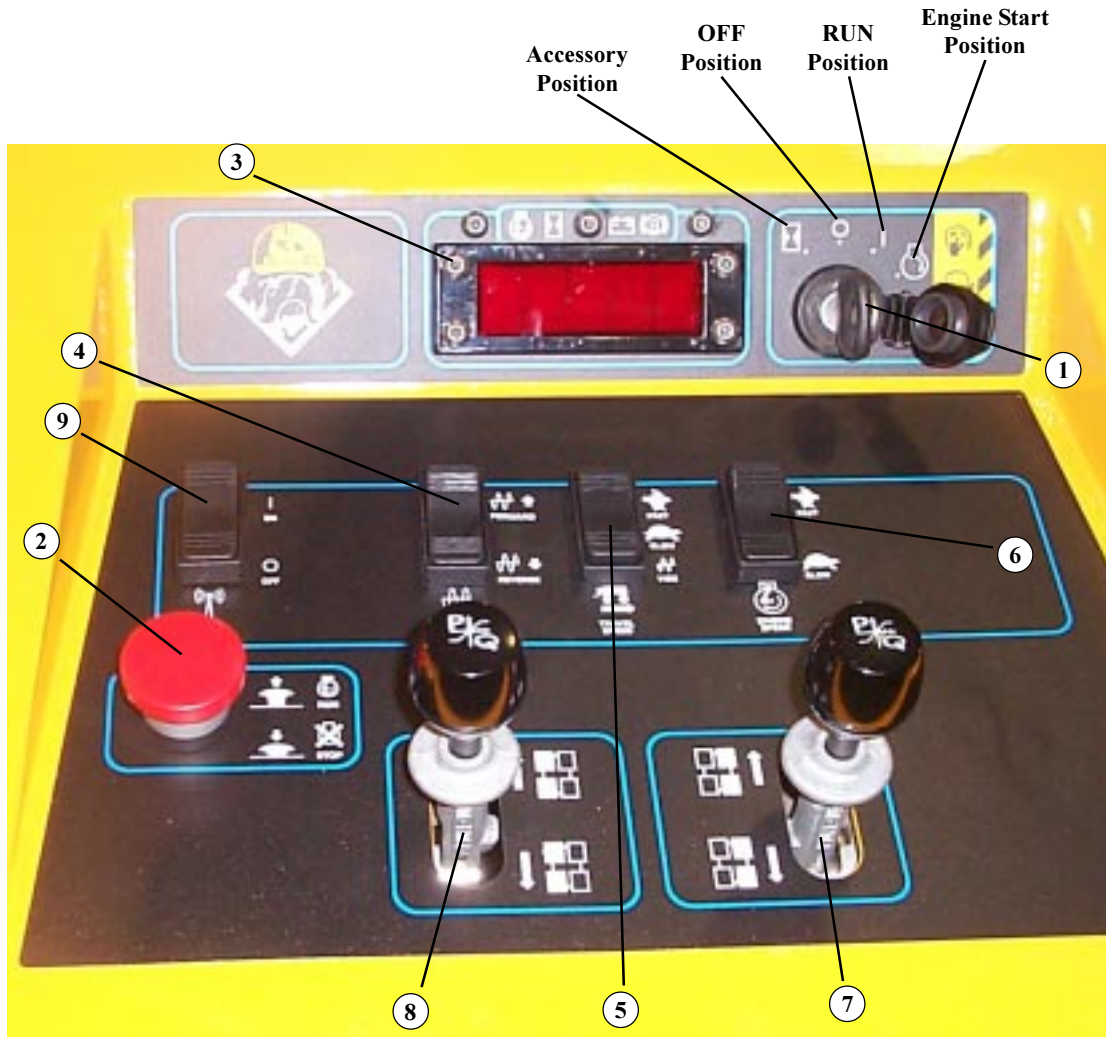
	Type	Quantity
Engine Crankcase	SAE 15W40 API-CD, CE Super Diesel (See Hatz instruction book for proper viscosity that matches the ambient temperature)	Approximately 2 quarts (1.9 liters)
Hydraulic System	Mobil 424 SUS255 55CST ISO VG55	13 gallons (49 liters)
Eccentric Oil	SAE 30W	16 ounces (473 milliliters)

1.4 MACHINE SOUND LEVEL TEST

Machine Type:	Bulldog Trench Compaction Roller
Sound Level Meter Calibration Date:	February 15, 2000
Meter Type:	Simpson Model 886-2 Type 2
Test Date:	February 15, 2000
Test Conditions	
Temperature:	31 degrees Fahrenheit / 1 degree Celsius
Ambient Sound:	dba fast mode
Soil Condition:	Silts and clays
Moisture Limit:	Approximately equal to 50%
Engine speed:	2800 rpm / 46.6 Hz
Frequency:	2000 vpm / 33.3 Hz
Test Site:	Honeoye, New York USA
Sound Level at Operator Position:	90 dba without vibrate 93 dba with vibrate

1. TECHNICAL DATA

1.5 MANUAL OPERATOR CONTROLS



1. Keyswitch - Keyswitch positions noted above.
2. E-Stop Button - Emergency stop.
3. Led Display - Message display/hour meter.
4. Vibe Direction Button - Vibration shaft direction.
5. Vibe On/Hi Speed Button - Vibration on, high travel speed or low travel speed.
6. Engine Throttle Button - Idle speed (turtle) or run speed (rabbit).
7. Right Side Forward/Reverse Control - Controls drum operation on the right side.
8. Left Side Forward/Reverse Control - Controls drum operation on the left side.
9. Radio Remote On/Off Switch.

1. TECHNICAL DATA

1.6 REMOTE OPERATOR CONTROLS



1. Power ON Indicator - Shows transmitter is on.
2. ON/Start Button - Starts machine/engine.
3. Stop Button - Stops machine/engine.
4. Right Side Forward/Reverse Button - Controls drum operation on the right side.
5. Left Side Forward/Reverse Button - Controls drum operation on the left side.
6. High/Low Speed Button - Controls machine speed high or low. Also shuts off vibration.
7. Vibe ON/Direction Button - Turns ON and controls direction of vibration.

2. HEALTH & SAFETY

SAFETY USE

These machines are designed to carry out the function of compacting material of the cohesive, bituminous and granular varieties.

If used correctly they will provide an effective and safe means of compaction and meet the appropriate performance standards.

It is essential that the driver/operator of the machine is adequately trained in its safe operation, be authorized to drive it, and have sufficient knowledge of the machine to ensure that it is in full working order before being put to use.

2. HEALTH & SAFETY

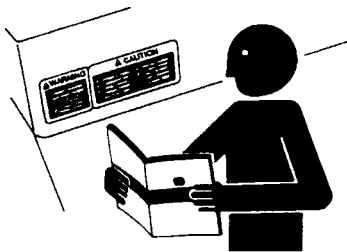
Safety Precautions

SAFETY PRECAUTIONS

Before using this equipment, study this entire manual to become familiar with its operation. Do not allow untrained or unauthorized personnel, especially children, to operate this equipment. Use only factory authorized parts for service.

When warning decals are destroyed or missing, contact the Manufacturer immediately at 1-800-888-9926 for replacement. For the safety of yourself and others, it is imperative that the following rules are observed. Failure to do so may result in serious injury or death.

FOLLOW SAFETY INSTRUCTIONS



- Carefully read all safety messages and decals in this manual and on your machine safety signs. Keep decals in good condition. Replace missing or damaged decals. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs and decals are available through your dealer.
- Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.
- Keep your machine in proper working condition. Unauthorized modifications to the machine may impair the function and/or safety and affect machine life.
- If you do not understand any part of this manual and need assistance, contact your dealer.

UNDERSTAND SIGNAL WORDS

▲ DANGER

▲ WARNING

▲ CAUTION

- A signal word – DANGER, WARNING, or CAUTION – is used with the safety-alert symbol. DANGER identifies the most serious hazards.
- DANGER or WARNING safety signs are located near specific hazards.
- General precautions are listed on CAUTION safety signs. CAUTION also calls attention to safety messages in this manual.



- This notation appears before warnings in the text. It means that the step which follows must be carried out to avoid the possibility of personal injury or death. These warnings are intended to help the technician avoid any potential hazards encountered in the normal service procedures. We strongly recommend that the reader takes advantage of the information provided to prevent personal injury or injury to others.

2. HEALTH & SAFETY

Safety Precautions



- Qualified personnel only. No untrained operators. Serious injury may occur.
- Users must be trained to operator this roller. Read the Operator's Manual. Learn to operate this roller safely.
- Do not operate across the sides of hills, roller may tip over.
- Do not operate at the edge of trenches or roads, roller may tip over.

USE COMMON SENSE WHEN HANDLING FUELS



- Transport and handle fuel only when contained in approved safety container.
- Do not smoke when refueling or during any other fuel handling operation.
- Do not refuel while the engine is running or while it is still hot.
- If fuel is spilled during refueling, wipe it off from the engine immediately and discard the rag in a safe place.
- Do not operate the equipment if fuel or oil leaks exist - repair immediately.
- Never operate this equipment in an explosive atmosphere.
- **EXPLOSION WARNING!** Cigarettes, flames, or sparks could cause battery to explode. Always shield eyes and face from battery. Do not charge or use booster cables or adjust post connections without proper instruction and training. **KEEP VENT CAPS TIGHT AND LEVEL.**
- **POISON WARNING!** Battery contains sulfuric acid. Avoid contact with skin, eyes, and clothing. In event of an accident, flush with water and call a physician immediately. **KEEP OUT OF THE REACH OF CHILDREN.**



- Ear protection required when operating this equipment.



- Never operate unit in a poorly ventilated or enclosed area.
- Avoid prolonged breathing of exhaust gases.

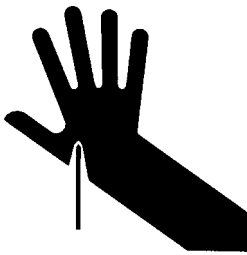
2. HEALTH & SAFETY

Safety Precautions

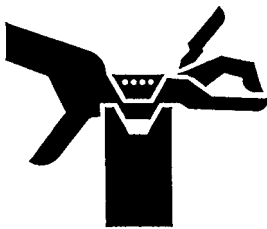


HOT SURFACES

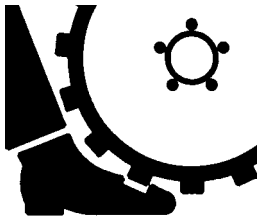
- Avoid contact with hot exhaust systems and engines.
- Allow all components in the engine compartment to cool before performing any service work.



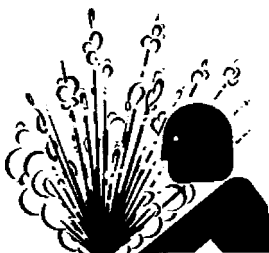
- Hydraulic system produces high pressures - incorrect hose replacement can cause serious personal injury. When performing service, refer to Service/Parts Manual for hose identification and connections.
- Caution: Escaping hydraulic fluid under pressure can have sufficient force to penetrate the skin, causing serious personal injury.
- Hydraulic fluid escaping under pressure from a very small hole can be almost invisible. Use a piece of cardboard or wood to search for possible leaks.
- Never use your hands to detect pressure leaks.
- Hydraulic tank temperature can reach 180 degrees F maximum.



- Never perform any work on the roller while it is running. Before working on the roller, stop the engine and remove the ignition key to prevent accidental starting, block drums to prevent rolling.
- Keep engine cover closed during the operation.
- Keep hands, clothing, and jewelry away from all moving parts.
- Keep all guards in place.



- Keep feet clear of all drums.
- Keep work area free of bystanders
- For foot protection, wear steel toe shoes or toe pads.

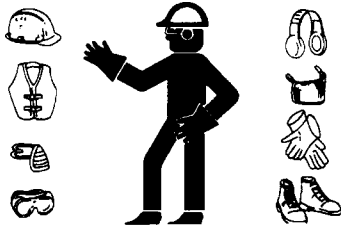


- Pressurized release of fluids from the hydraulic system can cause serious burns.
- Shut off engine. Only remove filler cap when cool enough to touch with bare hands. Slowly loosen cap to first stop to relieve pressure before removing completely.

2. HEALTH & SAFETY

Safety Precautions

WEAR PROTECTIVE CLOTHING



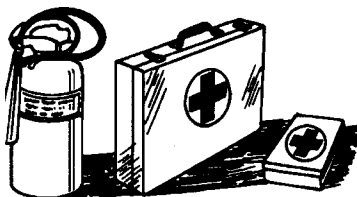
- Wear close fitting clothing and safety equipment appropriate to the job.
- Prolonged exposure to loud noise can cause impairment or loss of hearing.
- Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.
- Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating machine.

PRACTICE SAFE MAINTENANCE



- Understand service procedure before doing work. Keep area clean and dry.
- Never lubricate, service or adjust machine while it is moving. Keep hands, feet, and clothing from power-driven parts. Disengage all power and operate controls to relieve pressure. Lower equipment to the ground. Stop the engine. Remove the key. Allow machine to cool.
- Securely support any machine elements that must be raised for service work.
- Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts. Remove any buildup of grease, oil, or debris.
- Disconnect battery ground cable (-) before making adjustments on electrical systems or welding on machine.

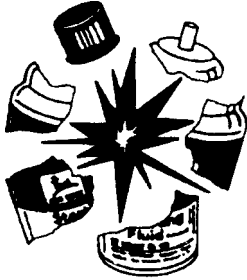
PREPARE FOR EMERGENCIES



- Be prepared if a fire starts.
- Keep a first aid kit and fire extinguisher handy.
- Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.

2. HEALTH & SAFETY

Safety Precautions



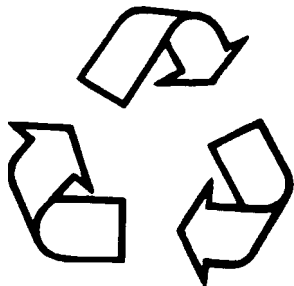
- Starting fluid (ether) is highly flammable, do not use or an explosion or fire may result.



PREVENT BYPASS STARTING

- Avoid possible injury or death from engine runaway.
- Do not start engine by shorting across starter terminal.
- Engine will start with PTO engaged if normal circuitry is bypassed.

DISPOSE OF WASTE PROPERLY



- Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with equipment include such items as oil, fuel, coolant, brake fluid, filters, and batteries.
- Use leakproof containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them.
- Do not pour waste onto the ground, down a drain, or into any water source.
- Air conditioning refrigerants escaping into the air can damage the Earth's atmosphere. Government regulations may require a certified air conditioning service center to recover and recycle used air conditioning refrigerants.
- Inquire on the proper way to recycle or dispose of waste from your local environmental or recycling center.

3. OPERATION

3. OPERATION

Bulldog®

3.1 INTRODUCTION

Congratulations on your purchase of a Stone BULLDOG®! You've made an excellent choice! Bulldog has been specifically designed as the ideal machine for delivering relentless compacting power over a wide variety of soils.

Bulldog's quad-roll design delivers serious performance. Some of the features you'll benefit from include: zero edge clearance, truly comfortable controls that are at the right height, the right angle, and for safety--automatically return to neutral when released. There is an anti-crush safety bar that stops the machine when pressure is applied, side and vandal proof shields, electric start, and central lifting eye as well as convenient tie-down points. These are just a few of the features that will make your life easier.

Bulldog's heavy duty shock mount system provides exceptional vibration isolation for engine, hydraulic pump and operator controls. The battery is double isolated and foam padded from vibration for extended life.

Stone offers two different machine widths, 24 inch (607 mm) and 34 inch (864 mm). Each drum is equipped with scraper bars to insure proper cleaning.

Upon receipt of your BULLDOG, CAREFULLY CHECK FOR ANY FREIGHT DAMAGE. Any damage should be immediately reported to the carrier and a claim registered.

Bulldog is manufactured to the strictest specifications and inspection procedures. If any material or manufacturing defects are found, return the tag on the machine with assembler's signature and your findings to the manufacturer. We want to know when a product is less than perfect. We also welcome any and all input on how the product may serve you better.

The following instructions were compiled to provide you information on how to obtain long and trouble free use of the unit. Periodic maintenance of this unit is essential. Read the manual in its entirety and

follow the instructions carefully. Failure to do so may injure yourself or a bystander.

3.2 MACHINE CONFIGURATION DESCRIPTION

The Stone Bulldog is supplied in two configurations:

1. Manual operation only.
2. Manual/remote operation.

Throughout this book the instructions will address operation for both manual and remote versions. Refer to the Technical Data Section to familiarize yourself with machine controls and components.

3.2.1 Manual Operation Only

A machine configured for manual operation only is started with the keyswitch. To stop use either the keyswitch or the red e-stop button. The operation is controlled through the switches found on the console. Switch functions are described in Section 3 under Operation.

Manual starting and control - The machine is started with the keyswitch. Control is accomplished through manipulation of hand switches found on the console. **Note:** Radio remote on/off switch should be in the "off" position.

3.2.2 Manual/Remote Operation

A machine configured for manual or remote operation will have the addition of the radio set on the machine.

Remote starting and control - All machine operations are controlled by the transmitter. To start, press the "on" button. To stop, press the "stop" button. Control is accomplished through manipulation of the switches found on the transmitter.

Notes:

1. If the keyswitch is used to start the machine, all control of the machine is accomplished at

3. OPERATION

Bulldog®

the operator switches. The remote functions are disabled.

2. The radio remote on/off switch must be in the “on” position to operate in remote.
3. If the “on” button located on the transmitter is used to start the machine, all control of the machine is accomplished at the transmitter. The manual functions are disabled.
4. The emergency stop button can be used to shut off the machine in either manual or remote operation.

3.3 BEFORE STARTING

Review the following information. Specific information regarding these items can be found in the Technical Data Section # 3 or located from the Table of Contents.

3.3.1 Warnings

Fuel is highly flammable, handle with care. Do not refuel the engine while smoking or when near an open flame or sparks. Always stop engine before refueling. Clean up spilled fuel before starting. Avoid fires by keeping engine clean of accumulated grease and debris.

Diesel fuel stored in galvanized containers reacts chemically with the zinc coating on the container. The chemical reaction creates powdery flakes of zinc sulfide. If water is present in the fuel, a zinc hydroxide gel will form.

Do not run unit in an enclosed, unventilated area. Avoid prolonged breathing of exhaust gases.

3.3.2 Pre-Start Checklist

1. Check engine oil level.
2. Check engine air cleaner.
3. Check engine fuel level. Note: Always use clean diesel fuel to prevent damage to the

fuel injection components.

4. Check hydraulic fluid level.
5. Check hardware for looseness. If loose, tighten according to torque chart.
6. Check hoses for looseness or leaking.
7. Visually check safety devices:
 - E-Stop Button - check that button is not damaged and that it moves properly.
 - Anti-Crush Bar - check that bar switch and actuation components are not damaged and that all parts move and work properly.

3.4 STARTING THE MACHINE

This machine can be started two different ways dependent upon the mode of operation.

3.4.1 Manual Mode (Item 1, Section 1.5)

Starting of the machine is accomplished by inserting the key and turning the keyswitch clockwise to the start position. After engine catches, release the key to the run position. At this time all switches on the operator control panel are operational. The engine will run at idle speed. All transmitter/radio functions are disabled.

Notes: The radio remote on/off switch should be in the “off” position. The radio remote on/off switch is located on the operator control panel.

3.4.2 Activating The Remote Control System

1. Turn radio remote switch to the “on” position (located on the operator control panel, see Section 1.5, Item 9).

3.4.3 Remote Mode (Items 1 & 2, Sections 1.5 & 1.6)

Starting the machine is accomplished by pressing the

3. OPERATION

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radio remote on/off switch located on the operator control panel to the “on” position. Then press the on/start button located on the transmitter. The engine will crank over. Run at idle speed for one second and then automatically switch to run speed. At this time, all switches on the transmitter are operational. All switches on the control panel, with the exception of the e-stop button, are disabled.

Note: Take care to store the transmitter in a safe, dry place (there is a storage area under the operator hood) to prevent accidental start or theft.

3.5 SHUTTING THE MACHINE OFF

This section describes shutting the machine off under normal circumstances.

3.5.1 Manual Mode (Items 1 and 6, Section 1.5)

To shut the machine off in this mode of operation, do the following:

1. Push engine throttle switch (Item 6) to idle speed position (Turtle Icon).
2. Turn keyswitch (Item 1) counterclockwise to the off position.

Note: Make sure the radio remote on/off switch is in the “off” position (located on the operator control panel, see Item 9, Section 1.5).

3.5.2 Remote Mode (Item 3, Section 1.6)

To shut the machine off in this mode of operation, do the following:

1. Press the red stop button located on the transmitter.
2. Turn off radio remote on/off switch (located on the operator control panel, see Item 9, Section 1.5).

3.6 EMERGENCY STOP (Item 2, Section 1.5)

This is an emergency stop button to be used in a situation where an immediate stop of the machine is desired. Pressing this button will shut the machine off immediately.

This button, red in color, is located on the operator control panel. It is operational in either manual or remote mode.

To restart the machine after depressing the e-stop button, rotate the top part of the button in the direction indicated by the arrows on the button (clockwise). This will release the button and cause it to lift up slightly, thereby resetting the circuit.

3.7 PARKING THE MACHINE

Always use care when parking the machine. Do not park on unstable ground or in an unsafe position. Observe the following cautions:

Never park the Bulldog on an incline. Bulldog may creep forward or reverse even when engine is off. Tipping may occur resulting in personal injury or engine damage.

Never operate Bulldog in a tip angle position for a long period of time. Engine damage will occur due to the lack of lubrication.

3.7.1 Parking Brake

To engage parking brake: Pull the brake handle and rotate approximately 90° or until the plunger is released. The proper position for the engaged parking brake would be the plunger resting against the drum between the drum pads.

To disengage parking brake: Pull the brake handle and rotate approximately 90° or until it snaps into the locked position. The plunger position for the disengaged parking brake would be the plunger in the locked position (approximately 1/2” above the drum pads).

⚠ WARNING DO NOT operate this machine with the parking brake engaged. Failure to

3. OPERATION

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disengage the parking brake may cause damage to the parking brake and/or to the machine.

▲WARNING ALWAYS fully apply the parking brake when leaving the machine. Failure to apply the parking brake could cause damage or injury.

3.8 ENGINE SPEED/THROTTLE CONTROL

The engine speed is controlled through an electric two-speed solenoid. Manipulation of the solenoid will cause the engine to change between idle and run speed.

3.8.1 Manual Mode (Item 6 Section 1.5)

This switch will cause the engine speed to change from idle to run and vice versa. The Turtle Icon is idle speed. The Rabbit Icon is run speed. For best results start engine at idle speed. Always run machine operations at run speed.

3.8.2 Remote Mode

Switching from engine idle to run speed is accomplished automatically through the microprocessor. When engine is started using the transmitter, it will always start at idle speed. After one second, it will automatically move to run speed.

3.9 MACHINE VEHICLE SPEED

Once the engine is at run speed, the vehicle speed is controlled through the hydraulic valves which manipulate pump flow. Switches control valve operation.

3.9.1 Manual Mode (Item 5 Section 1.5)

This switch located on the control panel has three functions:

1. High Travel Speed-Switch pushed fully forward will give maximum vehicle speed for travel. *Note:* Vibration is inoperative in high speed.

2. Low Travel Speed-Switch pushed to the center position will give slow speed with no vibration. This speed is used for loading on trailers or in trenches.
3. Vibe On-Switch pushed fully backward will turn the vibration on. Machine will travel at low speed with vibration.

3.9.2 Remote Mode (Item 6 Section 1.6)

This switch located on the transmitter has three functions:

1. High Travel Speed-Button on the transmitter pressed backward (towards Rabbit Icon) will initiate high travel speed.
2. Low Travel Speed-Button on the transmitter pressed forward (towards Turtle Icon) will initiate low travel speed.
3. Vibe Off Button - pressing this button in either high or low position will turn off vibration if it has been activated.

3.10 DIRECTION AND STEERING CONTROL

This machine's steering operates on a skid steering type principle. Steering and directional control are accomplished through the operation of switches that actuate hydraulic valves thereby manipulating pump flow.

3.10.1 Manual Mode (Items 7 and 8, Section 1.5)

Forward direction: Place the palm of your hands on the control levers and move the levers to their forward position (push). Machine motion will stop if lever is released.

Reverse direction: Pull the control levers back by grasping the knobs of the controls (pull). Machine motion will stop if lever is released.

Turning is accomplished by counter-rotating the drums. For example:

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To make a left turn: Pull the left control lever down to the reverse position while pushing the right control lever up to the forward position.

To make a right turn: Push the left control lever up to the forward position while pulling the right control lever down to the reverse position.

3.10.2 Remote Mode (Items 4 and 5 Section 1.6)

Forward direction: Push buttons located on transmitter down and forward in the direction indicated by arrows. Buttons must be held down to keep machine moving. Machine motion will stop if button is released.

Reverse Direction: Push buttons located on transmitter, down and backward in the direction indicated by arrows. Buttons must be held down to keep machine moving. Machine motion will stop if button is released.

Turning is accomplished by counter-rotating the drums. For example:

To make a left turn: Push the left control button down to the reverse position while pushing the right control button up to the forward position.

To make a right turn: Push the left control button up to the forward position while pushing the right control button down to the reverse position.

3.11 VIBRATION CONTROL

Machine vibration is accomplished by directing the pump flow to the hydraulic motor on the eccentric shaft. Manipulation of hydraulic valves determine the vibratory mode and direction. Hydraulic valves are switch-controlled.

3.11.1 Manual Mode (Items 4 and 5 Section 1.5)

To start vibration: Push switch (Item 5) fully backward to initiate vibration on.

To stop vibration: Push switch (item 5) either fully

forward (high travel speed mode) or to center position (low travel speed mode) to turn vibration off.

Vibration forward direction: Push switch (item 4) fully forward to rotate the eccentric shaft towards the engine side of machine.

Vibration reverse direction: Push switch (Item 4) fully backward to rotate the eccentric shaft towards the operator side of machine.

3.11.2 Remote Mode (Items 6 and 7 Section 1.6)

To start vibration: Push switch (item 7) either forward or reverse to initiate vibration on.

Note: This button does not have to be held on.

To stop vibration: Push switch (Item 6) either forward (low travel speed) or reverse (high travel speed) to turn vibration off.

Vibration forward direction: Push switch (Item 7) towards the arrow pointing to the top of the transmitter. This rotates the eccentric shaft towards the engine side of the machine.

Vibration reverse direction: Push switch (Item 7) towards the arrow pointing to the bottom of the transmitter. This rotates the eccentric shaft towards the operator side of the machine.

3.12 SAFETY ANTI-CRUSH BAR

3.12.1 Purpose And Location

A safety bar is mounted at the rear of the machine below the operator panel. The purpose of the bar is to stop reverse motion of the machine in the event that an operator becomes entrapped behind it.

3.12.2 Operation

When the bar is depressed, it will open a switch. This switch is located in the circuit that controls the hydraulic valve operation giving reverse motion. If the switch opens it will open the reverse motion

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circuit causing the machine to stop moving in reverse. The engine will remain running. Move the machine directional controls to forward motion to clear any entrapment.

3.12.3 Inspection

Always inspect that this device is attached and operating properly. Visually inspect bar, linkage, springs and switch. Test circuit with machine operating to ensure that it is working properly.

3.13 OPERATION ON SLOPES

Never operate the machine in violation of tip angle. Refer to Technical Section for tip angle and gradeability. Running the machine in excess of tip angle will cause machine to be unstable. The result could be operator injury, engine or machine damage.

4. LED DISPLAY

4. LED DISPLAY (ITEM 3, SECTION 1.5)

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4.1 LOCATION AND OPERATION

The LED display is located on the control panel. This display is embedded into the electronic control ignition block and is controlled through the microprocessor. The display's main function is to provide machine-operating information to the operator or the mechanic. Different types of messages and information that are displayed are defined in the following sections.

4.2 DISPLAY DURING START-UP - VOLTAGE

During engine start-up, the battery voltage level is shown in the display. This is shown while the keyswitch is in the START position.

4.3 DISPLAY DURING RUN - RPM

When the engine is running, the engine RPM is shown in the display. This is shown while the keyswitch is in the RUN position.

4.4 HOUR METER

To review the number of hours that the machine has been run, move the keyswitch to the accessory (counterclockwise from off position) position. In the accessory position the display will show three different pieces of information:

1. Hour meter - monitors run time of the machine.
2. Fault message - shows last fault that occurred. See next section.
3. Software revision level - Shows the revision level of the software that is controlling the microprocessor.

Note:

This information is stored in non-volatile memory. In the event that electrical power is lost, this information will stay intact. Upon electrical re-connect, this information will be available to be displayed.

4.5 FAULT MESSAGES

Fault messages are defined as situations that cause the machine/engine to shut down or to not start. These can be engine protect circuits or machine protect devices. These messages will be shown on the display and will indicate what is happening with the machine. They will be very useful for troubleshooting or performing preventive maintenance. There are five in total and they are defined as follows:

1. Low Oil or No Oil - This message will be displayed if proper oil pressure cannot be achieved or maintained (monitored by the oil pressure switch).
2. Cylinder Temperature - This message will be displayed if the cylinder heads exceed safe operating temperatures (monitored by the head temperature switch).
3. Tilt - This message will be displayed if the machine tip angle is exceeded (monitored by the tip switch).
4. E-Stop - This message will be displayed if the e-stop button is depressed and has not been reset (monitored by the E-stop button).
5. RPM Low - This message will be displayed if the engine speed drops below a minimum speed (monitored by the alternator output).

Note:

To view these fault messages, should they occur, move the keyswitch to the accessory position. There is always a fault message in the display. This will be the last fault that occurred. This memory location always requires input, therefore the last message will be displayed even after the fault has been corrected. These messages are also stored in non-volatile memory.

4. LED DISPLAY (ITEM 3, SECTION 1.5)

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4.6 WARNINGS

Warnings are defined as messages that indicate the electrical system is not charging properly. These messages will be flashed in the display when the machine is running in the manual mode. There are two in total and are defined as follows:

1. V Reg L - Voltage regulator low indicates that the system is not charging properly.
2. Bat Low - Battery low indicates that the voltage level of the battery is low. This will display at 10 volts.

5. RADIO SET

5. RADIO SET

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5.1 OPERATING PRINCIPLE

When operating this machine in the remote mode the machine functions are being manipulated through radio frequency (RF) control. Information is being transmitted from the transmitter (handset) to the receiver. This information is decoded and is used to manipulate relays and switches which control engine and machine functions.

5.2 IDENTIFICATION NUMBERS

The address codes and the radio frequency of the transmitter and the receiver must match for the machine to work properly. This is done to assure that only one transmitter can control one receiver and that multiple machines can be used on a job site without any interference. The ID numbers for each component can be found as follows:

Transmitter - Located in two places:

1. Decal on the back of the case.
2. Decal on the circuit board inside the case.

Receiver - Located in two places:

1. Decal outside cover of the receiver enclosure.
2. Decal on circuit board inside enclosure.

5.3 COMPONENTS

The radio set is comprised of three essential components:

1. Transmitter - Handset used to control machine operations by sending information to the receiver.
2. Antenna - Machine mounted device which receives and directs the transmitter signal to the receiver.

3. Receiver - Machine mounted enclosure which receives instructions from transmitter and transforms this information into switch manipulation causing the machine to operate as instructed

5.4 OPERATING INSTRUCTIONS

Instructions that describe how controls function can be found in the Operations section of this manual, (Section 3) and on the decal which is affixed to the back of the transmitter. (Remove the transmitter from the case)

5.5 POWER

The transmitter and receiver are both battery powered.

Transmitter Battery - The transmitter is powered by two AA 1.5 volt Alkaline batteries. These can be inserted by unfastening the four screws located on the back of the transmitter case and removing the cover. Note the direction of polarity and snap batteries into place.

Expected battery life is 100 hours. *Note:* Take care that contaminants do not enter the case during battery installation. Take care that wires are not pinched when placing the cover back onto the transmitter case.

Receiver Battery - The receiver is powered by the 12-volt machine battery.

5.6 SIGNAL TRANSMISSION

The signal transmission can be checked at the transmitter and at the receiver independently.

Transmitter - The LED window located on the face of the transmitter indicates if the unit is functioning properly. Refer to Item 1, Section 1.6. When the window is lit, glowing red in color and pulsing slowly, this is an indication that the transmitter is on and functioning. When control buttons are depressed the pulse rate should quicken. If the window color is amber, this is an indication that the battery power is

5. RADIO SET

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low and the batteries should be replaced. If the window fails to light, it is an indication that the batteries are depleted and should be replaced.

Receiver - Inside the cover of the enclosure the circuit boards are located. There is a series of LED lamps located on the circuit board. These lamps will light up when the receiver receives a signal from the transmitter to perform a function. Failure of lamps to light is an indication that the set is not functioning properly. In this event, call the Technical Services Department of Stone Construction Equipment for assistance.

5.7 RADIO SET CARE

Always take care to keep these electrical components dry and away from moisture. Do not pressure wash either of these components. If components appear damaged in any way notify the Technical Services Department for assistance.

6. MAINTENANCE

6. MAINTENANCE

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6.1 PERIODIC MAINTENANCE SCHEDULE

<u>Description</u>	<u>Interval</u>	<u>Part Number</u>
Engine Oil and Filter	Check oil level daily. Replace oil and filter at 25 hours, then every 100 hours.	P/N 39061
Air Filter	Check/clean daily.	
Diesel	Replace air filter element every 40 hours.	P/N 36559 Primary P/N 36561 Safety
Fuel Filter/Lines/Tank		
Separator	Replace water separator filter every 100 hours.	P/N 30345
Fuel Lines	Inspect weekly. Replace every 2 years.	P/N 46186
Tank/Strainer	Drain/clean every year.	P/N 39056
Injectors	Clean/set injectors every 250 hours.	P/N 38505
Engine RPM	Check every 100 hours.	
Battery/Charging System	Check/clean battery and connections every month. Check charging system every month.	P/N 36768 (12v 1000CCA 24-72P) 13-14 volts at full RPM
Valve Clearances	Service every 250 hours.	
Hardware/Engine Bolts	Check/tighten all hardware every 250 hours. Torque engine mounting bolts 33 ft. lbs.	
Hydraulic System	Check oil daily. Replace every 800 hours or yearly.	Mobile 424
Filter	Replace filter at 5 hours then every 100 hours.	P/N 39993
Strainers	Replace strainers every 800 hours or yearly.	P/N 47514
Breather	Check daily. Replace every 800 hours or yearly.	P/N 46934
Strainer Basket	Check weekly.	P/N 46951
Eccentric Housing Oil	Replace after 500 hours or yearly.	SAE 30W
Anti-Crush Bar	Check daily for proper operation. Check parts bi-monthly for excessive wear or stress.	
Scrapers	Clean and check daily.	

6. MAINTENANCE

Bulldog®

6.2 MAINTENANCE/LUBRICATION CHECKS

Never work on Bulldog with engine running. Severe personal injury may occur.

Disconnect battery to avoid accidental ignition of engine. Severe personal injury may occur.

6.3 ENGINE MAINTENANCE

Refer to the engine Owner's Manual provided with Bulldog prior to operating equipment.

6.4 HYDRAULIC OIL - MOBIL 424

Check hydraulic oil level daily using the sight gauge located on hydraulic tank. A 1/2" air bubble will be seen at the top of the gauge. Warning--never overfill the hydraulic tank. Replace hydraulic fluid every 800 hours or yearly.

6.5 HYDRAULIC OIL FILTER

Change hydraulic oil filter at 5 hours then every 100 hours.

CAUTION: The oil filter should be changed after a new unit has run 5 hours. This is to rid the system of any trapped contamination from the wear-in of parts. A filter has been provided for this purpose.

6.6 ENGINE OIL & FILTER

Replace engine oil filter at 25 hours then every 100 hours.

6.7 ENGINE AIR FILTER

Check daily, change every 40 hours P/N 36387.

Failure to clean and change the air filter regularly will result in engine damage.

6.8 FUEL FILTER/WATER SEPARATOR

Replace engine fuel filter every 100 hours or monthly.

6.9 HYDRAULIC OIL BREATHER

Check daily. Replace the hydraulic oil breather every 800 hours or yearly.

CAUTION: This breather is designed to pressurize the reservoir to 5 PSI (34.5). Loosen cap slowly to avoid injury whenever adding fluid or working on the hydraulic system.

6.10 CHARGE SYSTEM

Charge system should be checked every month. With the engine running at full speed, voltage should be 13-14 volts.

Always connect grounded cable last. Clean and securely connect each cable to the battery terminal of the same polarity. The battery should be securely fastened with properly installed hold-downs.

6.11 BATTERY

EXPLOSION WARNING! Cigarettes, flames or sparks could cause battery to explode. Always shield eyes and face from battery. Do not charge or use booster cables or adjust post connections without proper instruction and training. **KEEP VENT CAPS TIGHT AND LEVEL.**

POISON WARNING! Contains sulfuric acid. Avoid contact with skin, eyes or clothing. In event of accident, flush with water and call a physician immediately. **KEEP OUT OF REACH OF CHILDREN.**

Periodic battery maintenance is necessary to keep your unit reliable. Once a month check for proper battery charge, 12.5 volts. Make sure the cables are clean and tight. Keep the top of the battery clean and dry. Remove and clean battery posts and terminals every 6 months.

Note: Battery is maintenance free type, do not add water.

6. MAINTENANCE

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6.12 BATTERY POLICY

Battery warranty begins when a roller is sold from Stone Construction Equipment, Inc. or a Stone dealer to a customer.

Battery warranty claims must include the unit's purchase receipt with date. Claims without purchase receipt will be based on the battery identification numbers.

Battery returns and/or adjustments are made through battery distributors.

For nearest Exide distributor call:
1-800-782-7848.

Parts Master warranty: 50 month, 12 month free replacement. Thereafter, replacements will be based on an adjustment.

6.13 ECCENTRIC HOUSING OIL

The eccentric housing oil should be changed after 500 hours usage or yearly.

⚠ WARNING Danger of scalding from hot oil. Trap the old oil and dispose of it in accordance with local legislation.

The fill plug is located in the center of the housing cap. The drain plug is located on the bottom of the housing cap (opposite side from the fill cap).

To drain, remove the drain plug and remove the fill plug. Allow the oil to drain out completely. Replace the drain plug. Refer to the Lubrication Specifications Section for proper oil and quantity. Replace fill plug.

6.14 VALVE-TAPPET CLEARANCE

Check every 250 hours.

6.15 FUEL INJECTORS

Check and clean fuel injectors every 250 hours.

We recommend that you consult a HATZ SERVICE STATION or a specialist workshop for repair and adjusting operations to the injector.

Keep your hands away from the injector jets. The jet produced by a functioning injector can cause blood poisoning.

6.16 COOLING FINS - ENGINE

Clean dirt or debris from air intake. Clean engine cooling fins daily and more frequently when operating in dusty conditions.

6.17 HARDWARE/HOSES

Due to the nature of vibration equipment, periodically check all hardware and hoses for tightness.

6.18 TRANSMITTER BATTERY

New batteries received from Stone Construction Equipment, Inc. should be charged.

To set the battery life between charging, run the battery until it no longer works the first time you use it.

If battery replacement is required, remove four (4) screws from back of transmitter. Transmitter requires two (2) AA Alkaline Batteries.

For Remote Transmitter battery information, see section.

6.19 CLEANING MACHINE

When cleaning machine, caution should be used around regulator area of the engine. Excessive water pressure may loosen worn terminals or start terminals corroding. After each cleaning, these terminals should be dried and connections should be checked for proper seating. Failure to do so could cause future regulator failure or other electrical problems.

6. MAINTENANCE

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6.20 STORAGE

If Bulldog is taken out of operation for the Winter Season, maintenance overhaul must be carried out to prevent corrosion damage.

1. Clean engine's exterior surfaces thoroughly.
2. Drain lube oil and refill with special anticorrosion oil.
3. Drain fuel tank, add fuel stabilizer.
4. Disconnect battery - store in a warm dry area.

6.21 SPRING START-UP

1. Flush anticorrosion and replace with correct fluids. See fluid maintenance section.

Never use ether or other starting fluids to start diesel engine. Engine failure will result.

2. Add diesel fuel.
3. Reacquaint yourself with Operations and Owner's Manual.

6. MAINTENANCE

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6.22 TROUBLESHOOTING

PROBLEM	CAUSE	REMEDY
Engine lacks power	Injection pump drawing in air.	Clean or replace
	Fuel line plugged.	Clean or replace
	Dirty fuel filter.	Clean or replace
	Air filter dirty.	Clean or replace
	Worn cylinder & piston rings.	Replace
	Too much oil in crankcase.	Drain
Oil consumption	Worn valve guides.	Replace
	Worn cylinder & piston rings.	Replace
	Too much oil in crankcase.	Drain
	Loose oil filter or sending unit.	Tighten
	Loose bolts on oil pan.	Tighten
Blue smoke	Worn valves/valve guides.	Replace
	Worn cylinder & piston rings.	Replace
	Too much oil in crankcase.	Drain
	Oil seat at intake valve defective.	Replace
	Oil level in oil bath air filter too high.	Drain
Does not start	Empty fuel tank.	Fill tank
	Weak or dead battery.	Charge or replace
	Poor ground connection.	Tighten/clean terminals
	Dirty fuel injectors.	Replace/clean
	Loose wire connection in wire harness.	Tighten

6. MAINTENANCE

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6.22 TROUBLESHOOTING cont'd.

PROBLEM	CAUSE	REMEDY
Overheated	Defective injector.	Replace
	Crankcase oil level low.	Fill to proper level
	Restricted exhaust.	Clean or replace
	Cooling air restricted from dirt.	Clean
Roller won't move forward or reverse	Lever not fully engaged.	Engage lever
	Rocks or foreign material wedged in area.	Clean
	Control valve damaged.	Replace or repair
	Low hydraulic oil.	Check oil level, add if req.
	Faulty hydraulic pump or drive.	a) Replace pump if pressure is not in specified range in hydraulic motor drive circuit. b) Replace drive motor if measured pressure is correct.
Unit lacks power	Engine not properly warmed up.	Idle before operating to achieve operating temperature. Approximately five (5) minutes.
	Low hydraulic oil level.	Add fluid
	Plugged hydraulic filter/strainer.	Replace
	Fuel restriction.	Change water separator
	Faulty manifold.	Replace
No vibration	Bearing seized.	Replace bearing & cap
	Faulty eccentric motor.	Repair or replace
Drums rotate at different RPM's	Faulty check valve.	Replace
No high speed	Faulty check valve.	Replace
	Check valve positioned incorrectly.	Place check valve in correct position
	Faulty manifold.	Replace

6. MAINTENANCE

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6.22 TROUBLESHOOTING cont'd.

PROBLEM	CAUSE	REMEDY
Low oil alert light on ignition switch	Low oil in crankcase.	Fill crankcase
Unit won't run manually or in remote mode	No power in receiver.	Connect receiver power cord
	Blown fuse on receiver.	Replace
	Bulldog has a dead battery.	Replace/recharge
	Broken wire.	Check all wires and repair
Battery light on ignition switch	Circuit breaker tripped. circuit breaker.	Remote ignition box and reset
	Faulty electric system.	Short circuited wire
Unit runs manually, not in remote mode	Dead battery.	Burned out voltage regulator/alternator
	Radio switch not in "on" position	Put switch in "on" position
	No power in transmitter.	Connect transmitter power cord and turn on ON/OFF switch
	Low battery.	Replace battery
	Ignition switch in ON position.	Remove key
Suddenly stopped in remote	Wrong transmitter.	Check transmitter ID. Should match receiver. Maximum 85 frequencies.
	Out of remote range.	Walk toward unit
	Unit has dead battery.	Replace/recharge battery
	Blown fuse on receiver.	Replace
Not all functions work	Broken wire.	Check all wires and repair
	Possible chip failure in receiver box.	Change receiver box

**CALIFORNIA PROPOSITION 65 WARNING:
Operation of this equipment and/or engine exhaust
from this product contains chemicals known to the
State of California to cause cancer, birth defects,
or other reproductive harm.**



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The Way It Ought To Be.*

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