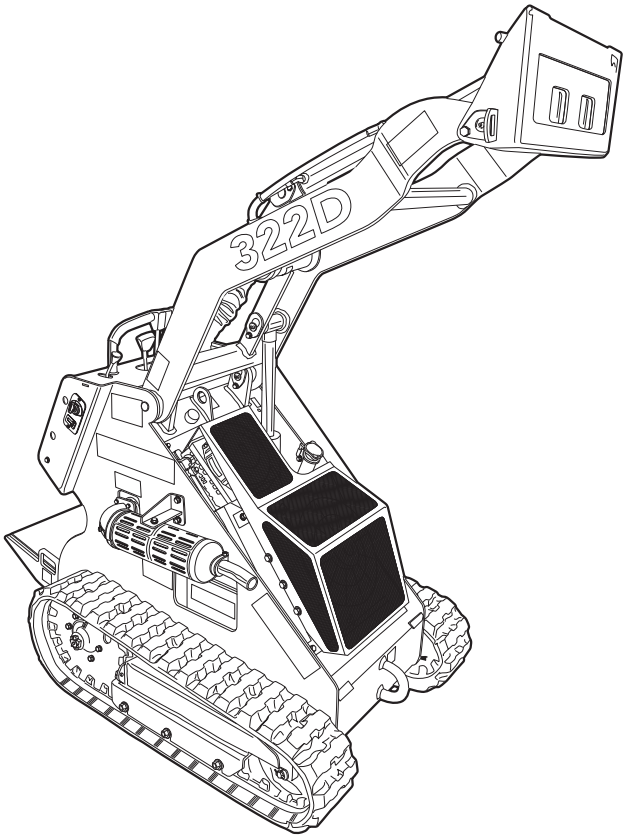
MERTZ MANUFACTURING, LLC

BOXER

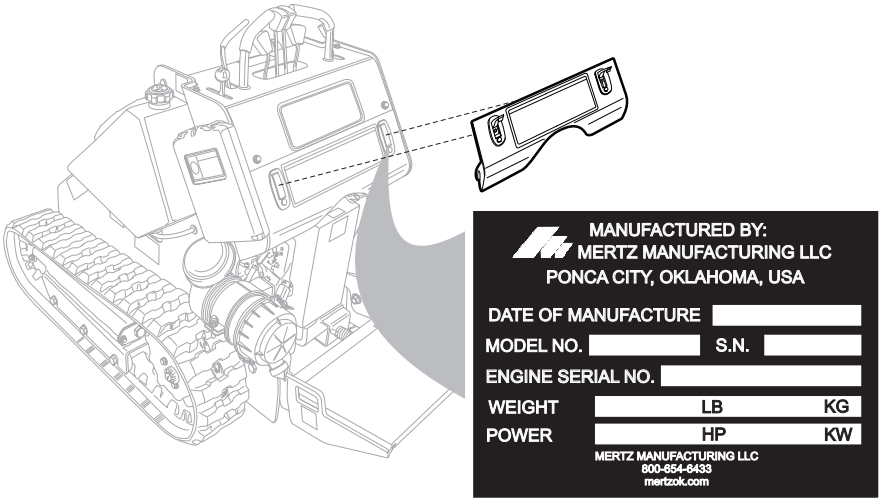
BIG POWER IN ALL PLACES

Part No. 999-825
Serial No.s 2793 and Higher



Boxer 322D Safety and Operator's Manual

Write your machines Serial Number in the space below for future reference. The serial number is located on the metal tag on the right side of the machine. Remove the service access panel to locate the Serial Number plate.



Record SERIAL Number here

Boxer Product Warranty

WARRANTY AND LIABILITY LIMITATIONS

Mertz Manufacturing, LLC warrants each new Compact Utility Loader manufactured (hereinafter referred to as the equipment) by us to be free from defects in materials and workmanship, for a period of one (1) year or 1000 operational hours, whichever occurs first from the date of delivery. This warranty is effective provided that the equipment warranted hereunder is operated by the purchaser in accordance with generally approved practices, is properly maintained in accordance with the instructions contained in this owner's manual, and is operated within the manufacturer's rated capacity limitations.

Any parts of the equipment found to be defective within the warranty period shall be repaired or replaced, at Mertz Manufacturing, LLC's sole option. Repairs must be performed at Mertz Manufacturing, LLC facilities or at an authorized dealer facility. Any part or parts proving defective within the above specified time will be repaired or replacement parts furnished, F.O.B. Ponca City, Oklahoma, providing such parts are returned, transportation prepaid, and found to be defective by the manufacturer.

The purchaser is responsible to keep maintenance records to substantiate proper maintenance. If a defect becomes apparent, it is the purchaser's responsibility to notify Mertz Manufacturing, LLC or an authorized dealer of said defect. The purchaser agrees to return the defective equipment or parts to Mertz Manufacturing, LLC or to an authorized dealer facility, freight prepaid, within fifteen (15) days after the defective condition is discovered.

All warranties, if any, extended to Mertz Manufacturing, LLC by manufacturers and suppliers of component parts, accessories, or other goods included in the manufacturing of Mertz Manufacturing, LLC products will be assigned, if contractually permitted, to the purchaser. Specific component warranty details will be provided to the purchaser upon request.

This warranty excludes the following: maintenance items including, but not limited to, seals, track grousers, roller bearings, filters and spark plugs, equipment that has been repaired, replaced, or altered by someone other than Mertz Manufacturing, LLC or an authorized service facility without prior approval from Mertz Manufacturing, LLC unless, however; if Mertz Manufacturing, LLC, in its sole opinion, determines that the defective condition of the equipment was in no way caused by or was attributable to said repairs, replacements, or alternatives.

Mertz Manufacturing, LLC and the purchaser agree that, in consideration of the above expressed warranty, all other warranties other than title, either expressed or implied, whether arising under law or equity including warranties of merchant ability and fitness for a particular purpose are excluded from this contract, further, the foregoing warranty is made solely to the first purchaser and may not be transferred in any form.

The sole liability of Mertz Manufacturing, LLC and the exclusive remedy of the purchaser arising out of the manufacture, sale, or use of the equipment provided hereunder, on warranties or otherwise, shall be limited to the cost of repair or replacement of defective parts as herein specified. Further Mertz Manufacturing, LLC's maximum liability hereunder arising from any cause whatsoever, including but not limited to, breach of contract or tort (including negligence), shall not exceed the contract price of the equipment furnished hereunder. Mertz Manufacturing, LLC shall not be responsible for work done, equipment or parts furnished, or for parts or repairs made by others unless the work is specifically ordered by Mertz Manufacturing, LLC. In no event shall Mertz Manufacturing, LLC be liable for removing defective parts or for reinstalling said parts when repaired or replaced by anyone other than Mertz Manufacturing, LLC or an authorized service facility or for any costs incurred with such removal or reinstallation.

CONSEQUENTIAL DAMAGES

Notwithstanding any other provision of this agreement, in no event shall Mertz Manufacturing, LLC be liable, whether arising under contract, tort (including negligence) or otherwise, for loss of anticipated profits, loss of use of capital or revenue, non-operational expenses, increased expense of operation cost of purchased or replacement equipment, damage to loads or contents of the equipment, transportation expenses due to repairs, claims of customers, cost of money, or for any special, incidental or consequential loss or damage of any nature arising at any time or from any cause whatsoever.

This Warranty Agreement shall be governed by, and construed and enforced in accordance with the laws of the State of Oklahoma. Any litigation under this warranty will be held in Kay County in accordance with the laws of Oklahoma.

Mertz Manufacturing, LLC P.O. Box 150 Ponca City, OK 74602

PO BOX 150 (74602) / 1701 N WAVERLY / PONCA CITY, OK 74601
PHONE: (580) 762-5646 / FAX: (580) 767-8411 / NT FAX: (580) 765-3934
www.boxerok.com

TRACK LIMITED PRORATED WARRANTY POLICY STATEMENT

Mertz Manufacturing LLC provides a limited warranty to the original purchaser that the original tracks used on consumer products manufactured and sold by Mertz Manufacturing LLC or its authorized Distributor/Dealer, will be free from defects in material and workmanship for a period of one (1) year after the date of purchase or 400 hours of use, whichever occurs first. Mertz Manufacturing LLC or its authorized Distributor/Dealer will replace any track found to be defective in either material or workmanship, using the below described prorated discount structure, and subject to the conditions, limitations, and exclusions set forth herein.

The one year or 400 hours of use duration of this warranty applies only if the product is put to ordinary and reasonable use. Genuine manufacturer supplied replacement track(s) not purchased with the original product purchase, but which are later purchased and used with that product, are warranted to be free from defects in material and workmanship for a period of sixty (60) days after the date of the "parts" purchase or 100 hours of use. The purchaser of these replacement tracks must be able to document the time frame and hours of use for the replacement tracks. Mertz Manufacturing LLC or its authorized Distributor/Dealer will repair or replace any such track free of charge during that period.

Prorated discount structure:

If the original track becomes unserviceable within the first 100 hours of use, Mertz Manufacturing LLC or its authorized Distributor/Dealer will replace that track at no cost including replacement labor. If the original track becomes unserviceable within the first 200 hours of use, Mertz Manufacturing LLC or its authorized Distributor/ Dealer will replace the track with a prorated discount from the cost of the track and no charge for the replacement labor. If the track becomes unserviceable within the first 400 hours of use, Mertz Manufacturing LLC or its authorized Distributor/Dealer will replace the track with a prorated discount from the cost of the track with no replacement labor paid.

This warranty is subject to the following conditions, limitations, and exclusions:

This warranty is valid only if the following conditions are met:

The warranty registration card must be completed and returned to manufacturer of the product.
The purchaser must perform maintenance and minor adjustments explained in the owner's manual.
The purchaser must promptly notify Mertz Manufacturing LLC or its authorized Distributor/Dealer service representative of the need for warranty service.

This warranty is subject to the following limitations:

Parts that are not genuine original manufacturer service parts are not covered by this warranty.

Products which are damaged and sold as salvage units or in an "as is" condition are not covered by this warranty.

Any defect which is the result of misuse, alteration, improper assembly, improper adjustment, neglect, accident, or damage caused by natural calamity beyond human control such as fire, flood, etc. is not covered by this warranty.

EXAMPLE OF THE 'PRORATED' COMPUTATIONS OF THIS TRACK LIMITED WARRANTY:

First, divide the number of hours on the original tracks, the hours on the unit, by 400 to determine the "wear percentage factor." Next, subtract the result from 1 to determine the "prorated discount" to be applied to the cost of the track. If a unit has 150 hours and requires a new track; divide 150 by 400 which equals **.38**, the "wear percentage factor." Subtract that number from 1 which equals **.62**, **or 62%**, the "prorated discount." In this case, the dealer will receive a warranty credit in the amount of his cost for the track less 62%. If the hours are less that 200 on the original track, a labor allowance of ½ hour will also be credited. No replacement labor will be paid if hours are over 200.

LIMITATION OF REMEDY AND DAMAGES

Mertz Manufacturing LLC's liability under this warranty, and under any implied warranty that may exist, is limited to repair of any defect in workmanship, and repair or replacement of any defective part. Mertz Manufacturing LLC shall not be liable for incidental, special, or consequential damages (including lost profits). Some states do not allow the exclusion of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

DISCLAIMER OF FURTHER WARRANTY

Mertz Manufacturing LLC makes no warranty, express or implied, other than what is expressly made in this warranty. If the law of your state provides that an implied warranty of merchantability, or an implied warranty of fitness for particular purpose, or any other implied warranty, applies to Mertz Manufacturing LLC, then any such implied warranty is limited to the duration of this warranty. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Boxer Warranty Registration

Dear Customer,

Mertz Manufacturing, LLC wishes to thank you for your purchase. We are committed to providing our customers with the finest products and product support available in any market today. To do this, we need to update our database with some specific information. Currently, the warranty start date is listed as the date the Boxer Compact Utility Loader left Mertz Manufacturing, LLC. This may be several months before you ever received the product. Mertz Manufacturing, LLC will restart the warranty date if you will complete the information below and return this form to us. We will continue to use the date the Boxer Compact Utility Loader left the factory as the warranty start date of record until we are told differently through receipt of this form. Not returning the form could result in your being denied some of your warranty entitlements.

To have Mertz Manufacturing, LLC reset the warranty start date, please complete the form below and mail or fax it back to: Mertz Manufacturing, LLC, P.O. Box 150, Ponca City, OK 74602, Fax: 580-767-8411.

Please take the time to complete and return this warranty form.

Fold

Name: _____

Address:_____

City: _____ State: Zip: _____

Telephone No. _____

Location Purchased: _____

Date Purchased: _____ Salesman: _____

____ I have received a copy of the Owners Manual for my engine.

____ I need a copy of the Owners Manual for my engine.

Signed: _____

Model No. _____ Serial No. _____

Affix
Stamp
Here

Mertz Manufacturing, LLC
P.O. Box 150
Ponca City, OK 74602

Safety Introduction

Be Prepared - Get to Know All Operating and Safety Instructions

This is the Safety Alert Symbol.

Wherever it appears, either in this manual or on safety signs on the machine, you should be alert to the potential for personal injury or accidents. Always observe safety precautions and follow recommended procedures.

Learn the Signal Words Used with the Safety Alert Symbol

The words **“DANGER”**, **“WARNING”**, and **“CAUTION”** are used throughout this manual and on labels on the machine indicate hazards or unsafe practices. All three statements indicate that safety is involved. Observe the precautions indicated whenever you see the Safety Alert symbol no matter which signal word appears next to the Safety Alert symbol.

DANGER

INDICATES A HAZARDOUS SITUATION THAT, IF NOT AVOIDED, IS VERY LIKELY TO CAUSE DEATH OR EXTREMELY SERIOUS INJURY. IT MAY ALSO BE USED TO ALERT AGAINST EQUIPMENT THAT MAY EXPLODE OR DETONATE IF HANDLED OR TREATED CARELESSLY.

WARNING

Indicates a hazardous situation that, if not avoided, could result in serious injury or death. It may also be used to alert against a highly unsafe practice.

CAUTION

Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury. It may also be used to alert against a generally unsafe practice.

NOTICE

This type of statement is used to draw attention to a procedure that needs to be followed to prevent machine damage.

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Section 1 – Safety Precautions

Since Mertz Manufacturing has no direct control over machine application or operation, following the proper safety practices is the responsibility of the owner and/or operator. Remember that this unit is only as safe as those who operate it. Safety tips shown throughout this Operator's Manual must be followed at all times.

GENERAL SAFETY

- Never operate the Boxer without first completely reading and understanding this Owner's Manual.
- Only authorized, qualified, and trained personnel are allowed to operate this machine.
- Never operate the machine under the influence of alcohol, awareness altering drugs, or medications that would affect your ability to operate safely.
- KEEP CHILDREN CLEAR FROM THE WORK SITE AREA AT ALL TIMES!
- NEVER ALLOW A CHILD TO OPERATE OR RIDE ON THE MACHINE
- Serious injury or death involving children can occur. Stay ALERT and be aware of your surroundings at all times. Stop operations if children wander onto the job site. Resume work only when the operating area is clear.
- Keep all non-operating personnel away from the machine during operation.
- Passengers must never be allowed to ride on the machine or any attachment.
- Wearing protective clothing and gear, such as hard hats, safety glasses, safety shoes, hearing protection, breathing protection, and long pants and shirts is highly recommended. Do not operate in clothing or shoes which will expose skin or feet to possible flying debris.
- Clothing should be relatively close fitting. Loose clothing, rings, and other jewelry should be avoided because of the danger of catching them on machine parts or controls or on any rotating parts, either on the machine or any attachment.
- Keep hands/fingers clear from all rotating parts.
- Never touch engine parts or machine components while they are hot.
- Always perform the "Standard Shut Down Procedure" shown in this manual, if the unit will be left unattended for any length of time.
- Use only original Boxer or approved replacement parts and attachments. Imitation parts may lead to unit damage and/or injury to personnel. The machines' warranty may be voided if unauthorized parts and attachments are used.

OPERATING SAFETY

- Plan ahead and learn as much as possible about your job-site area before beginning any work.
- Know the exact location of overhead power lines or obstructions.
- Have all buried lines such as; gas, electric, water, telephone and cable TV, marked by the proper authorities.
- Prior to use, perform the “Pre-Start Inspection” and Daily Maintenance to make sure that the unit is in safe operating condition.
- Never operate a malfunctioning unit!
- Keep hands, gloves, shoes, control knobs, and operator platform clean. Slippery controls can cause you to lose control, which may result in an accident.
- Always keep a firm grip on the hand rails located at the operator's platform during travel and operation to prevent falling off the unit.
- When working on an unfamiliar construction site, review, understand and follow job site safety rules.
- Keep the work site clear of all non-operating personnel. Should a person enter the work area, stop machine operation until the work area is clear.
- Prior to unloading the unit and starting to work, inspect the path you will travel and work site area for potential hazards. Some of the hazardous conditions you may encounter are:
  - Holes
  - Deep ditches or excavations
  - Drop-offs
  - Soft un-compacted soil
  - Culverts
  - Deep mud / Standing Water
  - Large rocks
  - Slippery surfaces
  - Steep slopes
  - Tall grass, trees, or shrubs

  If any of these conditions exist, correct the hazard or obstruction. If any of these conditions can not be corrected, avoid operating or traveling near them.
- Be extremely cautious traveling through or near trees, brush, shrubs or any obstacles which might obscure your vision. These might hide potential hazards, such as the edge of a steep slope, deep holes, large rocks, etc.
- Never operate near a ditch or embankment where loose or soft ground conditions could cause the surface to give way under the machine causing it to become unstable.
- Never exceed the rated capacity of the machine. When using attachments, know their capacity ratings and unit limitations. Unit specifications can be found in the Operator's Manual

- Never attempt to operate any attachment without first understanding proper installation and operating procedures. The center of gravity, stability, and operating characteristics of the entire machine will change with the use of different attachments.
- Operate all controls slowly and smoothly and never abruptly stop any function. This can cause the machine to become unstable.
- Always look in the direction of travel.
- Come to a complete stop prior to reversing travel directions.
- Reduce speed and proceed with caution when traveling in reverse or turning.
- Never travel with the loader boom or attachment raised. Lower the boom or attachment as soon as possible and travel with the boom at the lowest safe height.
- When traveling with a loaded bucket or forks, the load should be level and the bucket or forks tilted back to reduce spilling or losing the load.
- Approach corners slowly, turning too fast or sharp may cause the machine to tip over.
- Stay alert when operating near traffic or roadways.
- If the unit should begin to tip or become unstable, DO NOT try to stabilize the unit with your legs or arms.
- If the unit is involved in an accident or inadvertently damaged during operation, stop and perform a thorough inspection. Make sure the unit is in safe operating condition prior to resuming work.
- Be alert to any unusual reaction to any of the controls. If anything unusual is noticed, shut the machine down and thoroughly inspect it to determine the cause of the problem. Do not operate the machine until all required repairs have been made.
- If the unit must be left unattended, shut the machine down and make sure that it can not be started by an unauthorized individual.
- Operating on steep slopes can be dangerous and there is a greater risk of the machine tipping over or becoming unstable. The list of rules below must be understood and followed for maximum safety:
  - Avoid excessively steep slopes or unstable surfaces. If travel on a slope is necessary, keep the load low and proceed with extreme caution.
  - DO NOT travel ACROSS excessively steep slopes under any circumstances.
  - Travel straight up and down slopes with the heavy end of the machine pointing up the incline. When the machine has no load, the operator's platform end of the machine is considered the heavy end. When the machine is loaded or has an attachment on the front of the machine, the front is considered the heavy end.
  - Turning on slopes is not a recommended practice, however if you must turn on slopes; reduce travel speed to as slow as possible, and exercise extreme caution. Avoid sharp turns or sudden movements.
  - Wet or slick ground conditions should be avoided as reduced traction could cause the machine to slide down the slope.
  - Do not attempt to install or remove attachments on a slope.
  - Never park the unit on a slope

SERVICE & MAINTENANCE SAFETY

Maintenance work can be hazardous if not done in a careful manner. All personnel should realize the hazards and strictly follow safe maintenance practices. Failure to comply with these safety precautions may result in serious personal injury and/or death.

- Use only Boxer supplied or approved replacement parts and attachments. Imitation parts may lead to unit damage and/or injury to personnel. Warranty may be voided if unauthorized parts and attachments are used.
- Wear the proper protective clothing and personal safety equipment necessary to perform the maintenance or service required.
- Keep the machine free of grass, leaves, or other debris build-up.
- Clean up oil or fuel spillage.

⚠ WARNING

Fuel or oil leaks or spills can create a fire or explosion hazard.

- Prior to performing maintenance or service, park the unit in a level area away from obstructions and/or work site hazards.
- Be sure the area has adequate light and is well ventilated. NEVER operate the machine inside a closed area.
- Clean-up any oil, grease, mud, water, or snow which might cause the floor surface to become slippery.
- If the machine requires maintenance, take the machine out of service and attach a "Do Not Operate" tag at the control panel and remove the ignition key.
- If maintenance or repairs require the boom to be raised, the "Hydraulic Cylinder Lock" must be installed.
- Know where all pinch points and rotating parts on the unit are. These areas must be avoided to prevent serious injury.
- Remove only those guards or covers on the component being serviced and replace them immediately upon completion of the work.
- Never attempt to adjust or service engine or machine components while they are hot.

ELECTRICAL SYSTEM HAZARDS

- Prior to working on the electrical system:
  - Disconnect battery cables, removing the battery ground cable first.
  - When re-connecting the battery, connect the battery ground cable last.
  - Never allow battery cables to contact hydraulic lines or rub against sharp edges.

Battery Hazards

Before working with batteries, the following are important points about battery safety that you should be aware of:

- Batteries are always surrounded by extremely explosive gases. This is especially true when the battery is being charged. To avoid explosion:
  - Do not smoke near batteries.
  - Keep arcs, sparks and open flames away from batteries.
  - Perform battery service work only in a well ventilated area.
- Make sure to dispose of batteries according to local regulations.
- Electrolyte Hazards:

  NOTICE: The batteries on the machine may be either be “wet cell” or gel cell. It is still important to know and follow these warnings and cautions.

  Battery electrolyte in standard “wet cell” batteries contains sulfuric acid which is poisonous and can cause severe chemical burns. To avoid personal injury:
  - Wear a face shield to prevent sulfuric acid contact with your eyes
  - Wear chemical resistant gloves and clothing to keep acid off your skin and clothing.
  - Since wet cell batteries give off explosive gases, use a flashlight to check the electrolyte level, not an open flame such as a match.
  - Never check the battery by placing a metal object across the battery posts. The resulting spark could ignite anything flammable, causing fire or an explosion.
  - If electrolyte is splashed into your eyes, flush them immediately with clean water and seek medical attention.
  - If electrolyte is swallowed, seek medical attention immediately.
  - If electrolyte is splashed onto exposed skin or clothing, flush and clean the area immediately with clean water and seek medical attention if necessary.

Jump Starting/Battery Charging Hazards

Follow the instructions for jump starting or battery charging in the engine owner's manual. You must be at the operator's platform when attempting to start the unit with booster batteries and jumper cables so that you are at the controls when the engine starts.

Here are some general safety rules you must follow for jump starting the machine:

- Make sure to connect the positive jumper cable to the positive (RED) battery terminal.
- Connect the negative cable to the engine, machine chassis or the furthest ground point away from the battery. Never make the final connection at the starter or dead battery. Sparks may ignite the explosive gases surrounding the battery.
- When disconnecting cables after jump starting, remove the negative cable first and then the positive cable.IMPORTANT: DO NOT let the cable clamps touch when disconnecting them. Severe damage can occur to the booster battery or machine.
- Never charge a battery or attempt to jump start a frozen battery. The sudden surge in electrical power could cause the battery to explode.

Hydraulic System Hazards

The hydraulic system is under pressure whenever the engine is running and may hold pressure even after the engine is shut off. Cycle all hydraulic controls after the loader boom is resting on the ground. Some components will retain residual or trapped pressure. Use extreme caution when removing any hydraulic component.

During inspection of the hydraulic system:

- Cycle all hydraulic controls to release residual pressure.
- Wait for the hydraulic fluid to cool down before disconnecting any hydraulic lines. Hot hydraulic fluid can cause severe burns.

⚠ WARNING

Hydraulic oil under pressure can penetrate body tissue causing serious injury and possible death. When troubleshooting a hydraulic system for leaks, always use cardboard or wood as a detector. DO NOT USE YOUR BARE HANDS. If you are injected with hydraulic oil or any other fluids, immediately seek treatment by a doctor trained in the treatment of penetrating fluid injuries.

- Hydraulic fluid can cause permanent eye injury. Wear safety glasses or a full face shield to provide appropriate eye protection.
- When venting or filling the hydraulic system, loosen the filler cap slowly to allow any pressure in the hydraulic tank to be released and remove the cap gradually.

Fueling Hazards

Most fuels are highly flammable. Observe the following precautionary practices to reduce the possibility of a serious accident:

- Always refuel the unit in an open, well ventilated area away from sparks or open flames.

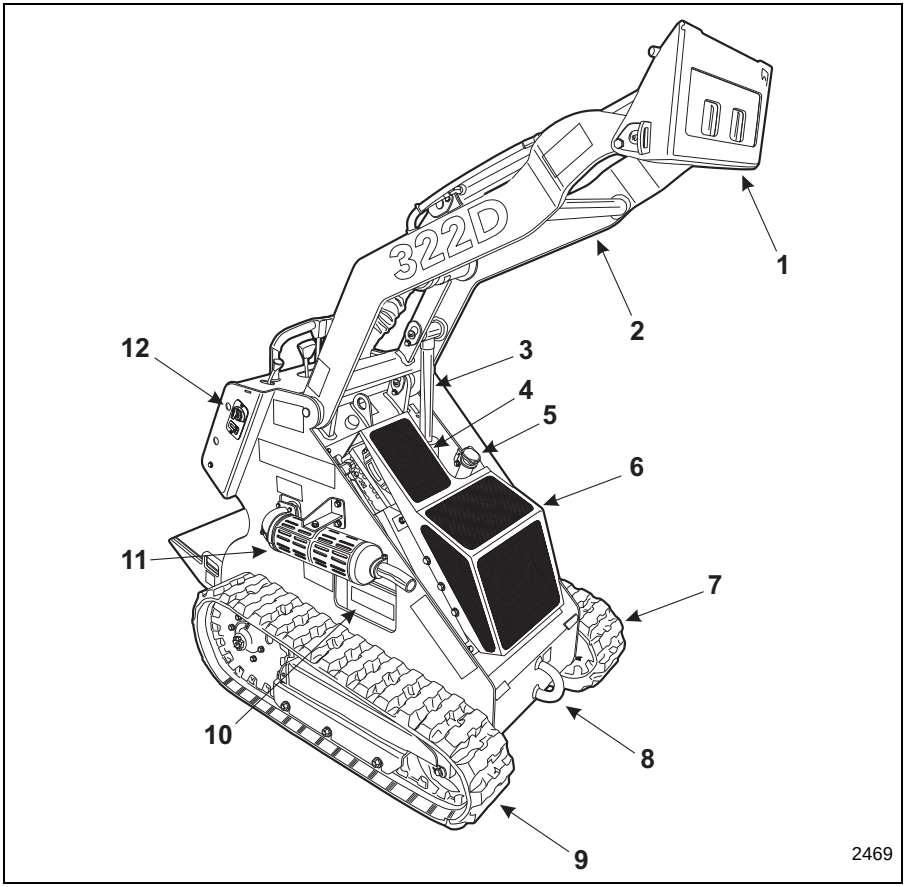
Diesel Engines:

- **Shut the engine off before attempting to fuel the machine. Never refuel a unit while it is running.**
- **Allow engine to cool before re-fueling**
- **Always use a funnel or pour spout when filling the tanks.**
- **Under certain circumstances a static charge can develop and ignite the fuel. Make sure that you are standing on the ground when filling the fuel tanks.**
- **If you are filling the fuel tanks from a service vehicle, make sure to connect the service vehicles ground cable to the machine before beginning the fueling process. Keep the fuel nozzle in constant contact with the rim of the machines fuel tank.**
- **When filling a portable gas container, always place it on the ground. Never fill a portable fuel container while it is inside a vehicle, truck, pick-up bed, or any surface.**
- **To avoid static sparks when using a portable fuel container, only fill the container when it is positioned on the ground and keep the fuel container nozzle in contact with the tank opening during filling.**
- **Make sure to move the unit from the transport truck or trailer and only refuel the unit on the ground, using an approved container.**
- **Keep sparks and flames away from fuel.**
- **Do not smoke while refueling or when handling the fuel container.**
- **Never cut or weld on or near fuel lines, tanks or containers.**
- **Never overfill the tank.**
- **Clean up spilled fuel immediately.**
- **Store fuel in an approved container and keep out of the reach of children.**

Section 2 – Operating Controls

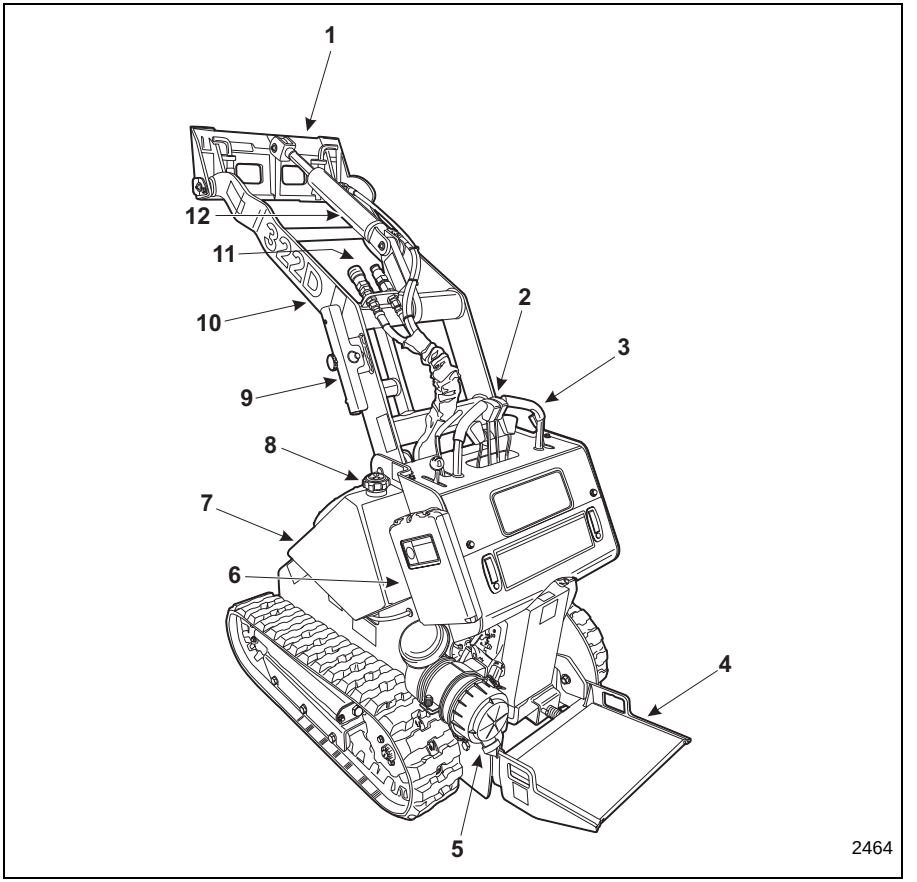
Component Locations

Right Front View



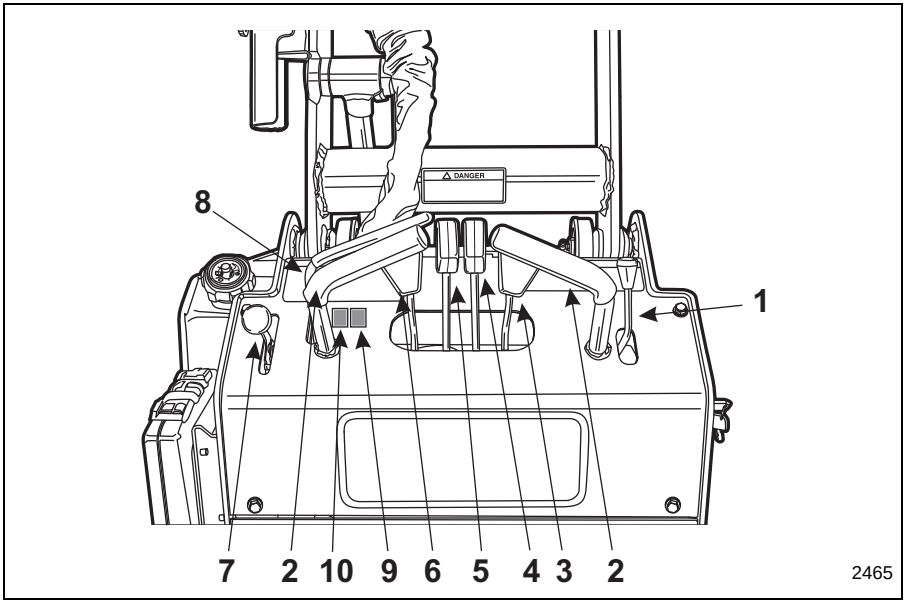
Item No.	Description
1	Attachment mounting plate
2	Loader arms
3	Boom lift cylinder
4	Hydraulic cooler
5	Radiator filler pressure cap
6	Engine radiator
7	Left track assembly
8	Front tie-down ring
9	Right track assembly
10	Battery
11	Muffler
12	Ignition switch and hour meter

Left Rear View



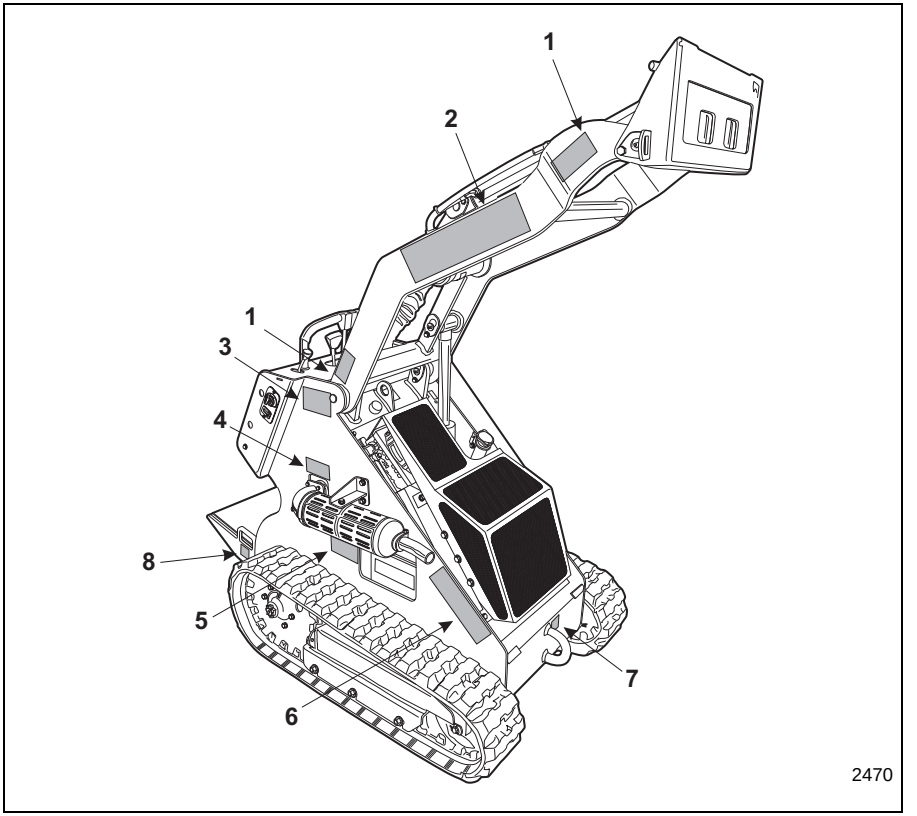
Item No.	Description
1	Attachment mounting plate
2	Operating controls
3	Hand grip
4	Operator's Platform
5	Air cleaner assembly
6	Manual holder
7	Fuel Tank
8	Fuel filler cap/fuel gauge
9	Safety support
10	Loader arms
11	Attachment hydraulic quick connects
12	Tilt cylinder

Operating Controls



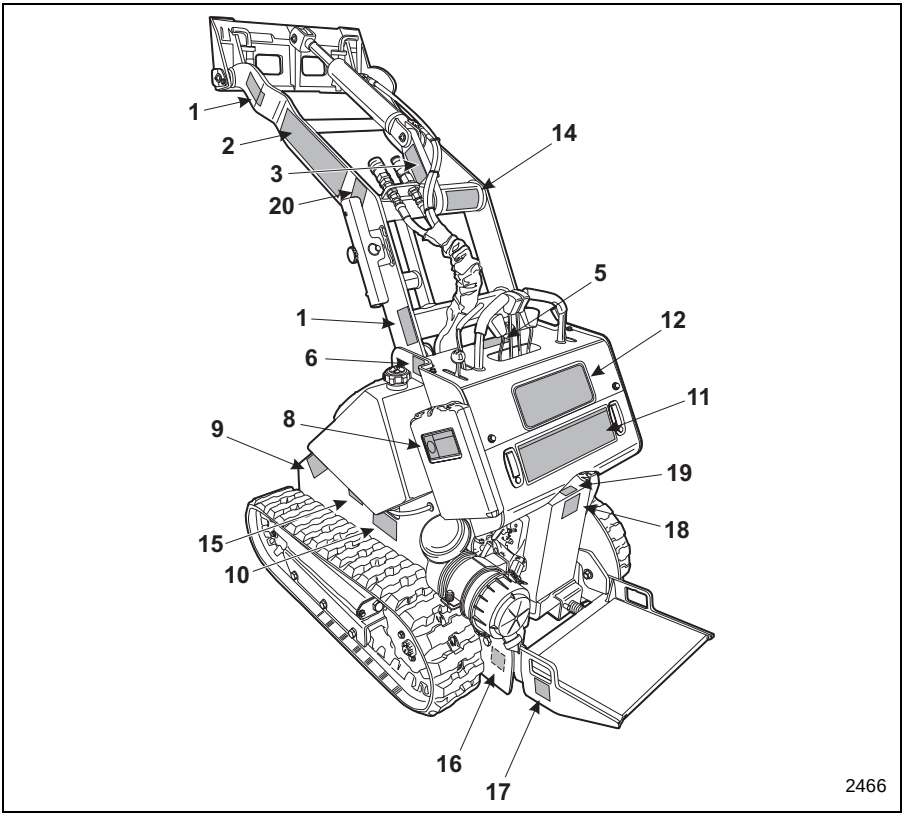
Item No.	Description
1	High/Low selector control
2	Hand grip
3	Attachment tilt control
4	Right travel motor control
5	Left travel motor control
6	Loader arm lift control
7	Engine throttle
8	Auxiliary attachment activation control/Operator presence
9	Engine temperature indicator light
10	Low oil indicator light

Machine Decals – Front View



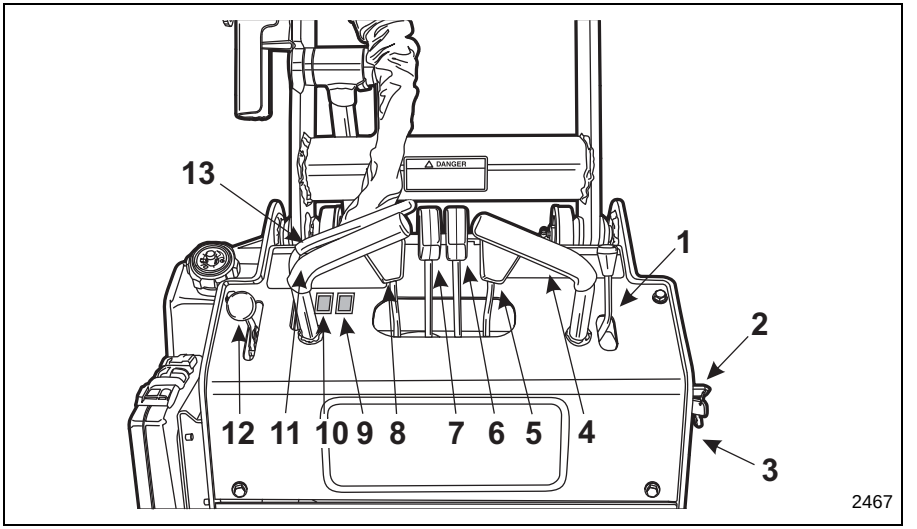
Item No.	Description
1	Crush hazard decal
2	Model number decal
3	Danger zone decal
4	Burn hazard decal
5	Battery explosion hazard decal
6	Boxer decal
7	Front tie down location decal
8	Rear tie down location decal

Machine Decals – Rear View



Item No.	Description
1	Crush hazard decal
2	Model number decal
3	Burn hazard decal
4	Cylinder lock installation decal
5	Auxiliary valve warning decal
6	Diesel fuel decal
7	Allow unit to cool warning decal
8	Read Operator's Manual warning decal
9	Small Boxer decal
10	Danger zone decal
11	Safety instructions decal
12	Operating controls decal
13	Shutdown instruction decal
14	Attachment security decal
15	ISO 46 Hydraulic fluid decal
16	Shut off fuel decal (inside frame at filter)
17	Machine tie down decal
18	California Prop 65 warning decal
19	Do Not Use starting fluid warning decal
20	Cylinder lock installation warning decal

Operating Controls Description



1. **High/Low Selector Lever** – Moving this lever either fully forwards or fully backwards selects the machine function speed. When the lever is in the Low position, all control and travel functions will be in the slower speed range. With the lever in the High position, all control and travel functions will be in the high speed range.
2. **Ignition Switch and Key** – Rotating the key switch one position to the right turns on the engine ignition and the low oil pressure warning. Rotating the key switch fully to the right activates the engine starter.
3. **Engine Hour Meter Gauge**
4. **Hand Grip**
5. **Attachment Tilt** – Pushing the lever forwards tilts the attachment plate forwards, lowering the attachment. Pulling the lever backwards tilts the attachment plate backwards, raising the attachment.
6. **Right Travel Motor Control** – Pushing the lever forward rotates the right side wheels for forward travel. Pulling the lever backwards rotates the right side wheels for reverse travel.
7. **Left Travel Motor Control** – Pushing the lever forward rotates the left side wheels for forward travel. Pulling the lever backwards rotates the left side wheels for reverse travel.
8. **Boom Raise and Lower** – This lever controls the raising and lowering of the boom assembly.
9. **Engine Temperature Indicator** – This light indicates that the engine is in an overheated condition. If the light and sounder turn on while the machine is being operated, immediately stop all machine operations and shut the engine off.
10. **Engine Oil Pressure Indicator** – The light will turn on and a warning sounder will also turn on while the ignition key is in the START position. When the engine starts and the key is released, the light and sounder turn off. If the light and sounder remains on, or turn on during normal operation, immediately turn off the engine and check the engine oil level.

11. **Hand Grip**
12. **Engine Throttle** – Moving the control lever upwards increases engine speed and moving the lever downwards slows the engine to idle speed.
13. **Attachment Activation Lever/Operator Presence Control** – With your left hand, squeeze the AUXILIARY attachment control lever towards the hand hold to activate the attachment in the FORWARD motion.

    NOTE: The lever is spring loaded and when released, will automatically move from the FORWARD motion position to the NEUTRAL position, stopping attachment motion.

    If you want to reverse the operation of the attachment, move the auxiliary control lever to the REVERSE position. The control lever will remain in the REVERSE position detent until it is moved to the NEUTRAL position.

⚠ CAUTION

DO NOT attach an auxiliary hydraulic cylinder to the hydraulic circuit controlled by the Attachment Activation Lever/Operator Presence control. Hydraulic pressure will not be held in the system when this control is returned to the NEUTRAL position.

Section 3 – Pre-Start Inspection and Operation

DANGER

IMPROPER USE OF THE COMPACT UTILITY LOADER COULD CAUSE SERIOUS INJURY OR DEATH. BEFORE OPERATING THE MACHINE, OR PERFORMING MAINTENANCE, THE OPERATOR MUST READ AND UNDERSTAND THE ENTIRE OPERATOR'S MANUAL, REVIEW MACHINE CONTROLS, LOCATE AND REVIEW ALL WARNINGS AND SAFETY PLACARDS AND RELEVANT OPERATOR SAFETY MATERIALS INCLUDING WRITTEN, VISUAL, VIDEO OR VERBAL INSTRUCTIONS.

Pre-Start Inspection

It is very important to do a visual inspection of the machine before beginning operation. This inspection should include:

- Check all decals and warning signs for damage.
- Check engine oil.
- Check and refill fuel tanks.
- Check hydraulic lines and hoses for signs of damage or leaks.
- Inspect the machine for any signs of damage or loose fasteners.
- Check fluid levels and any signs of leaking fluids.
- Do all Daily Service Checks.
- Check machine controls to make sure that they automatically return to the neutral position.

The following information presents details on these inspection points and service checks.

Daily Service Checks

Table 1: Service Cycle Table

Activity	Daily (10 Hours)
Safety Placards	✓ and R
Fuel	✓ and A
Engine Oil	✓ and A
Engine Oil Filter	
Engine Coolant	✓ and A
Engine Radiator	✓**
Air Filter	✓
Fuel Filter/Water Separator	✓
Engine Idle Speed	
Check and Clean Battery Terminals and Battery	
Hydraulics - Hydraulic Filter - Hydraulic Fluid Level - Hydraulic Hoses	 ✓ ✓ and A ✓
Grease	✓***
Tracks	✓
Visual Check for Loose/Missing Fasteners	✓
Check and Adjust Track Tension	✓

Service Cycle - R = Replace ✓ = Check A = Add

***Under very wet, muddy, dusty or dirty working conditions more frequent lubrication may be required.

Do the following pre-start service checks:

1. Check condition of all warning and instructional decals. Replace any damaged decals with genuine Boxer decals.
2. Check engine oil -
   - Make sure that the engine is OFF.
   - Pull out the dipstick (Item 1, Figure 3–1) and look for both the full and add oil lines. The correct level is between those two lines.

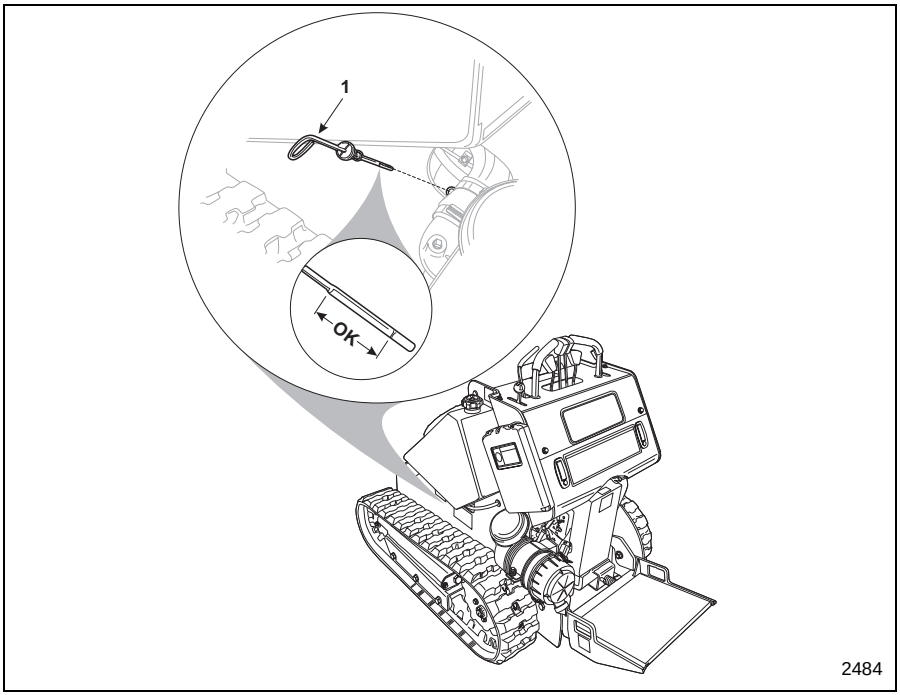


Figure 3–1 Engine Oil Level Check

- If the engine oil level is below the add line, carefully add the proper amount of oil through the engine oil filler (Item 1, Figure 3–2). To reach the oil filler cap, remove the lower locking service panel. It is important to add the correct type of engine oil as stated in the engine manual.

NOTICE: Make sure to reinstall and secure the oil filler cap.

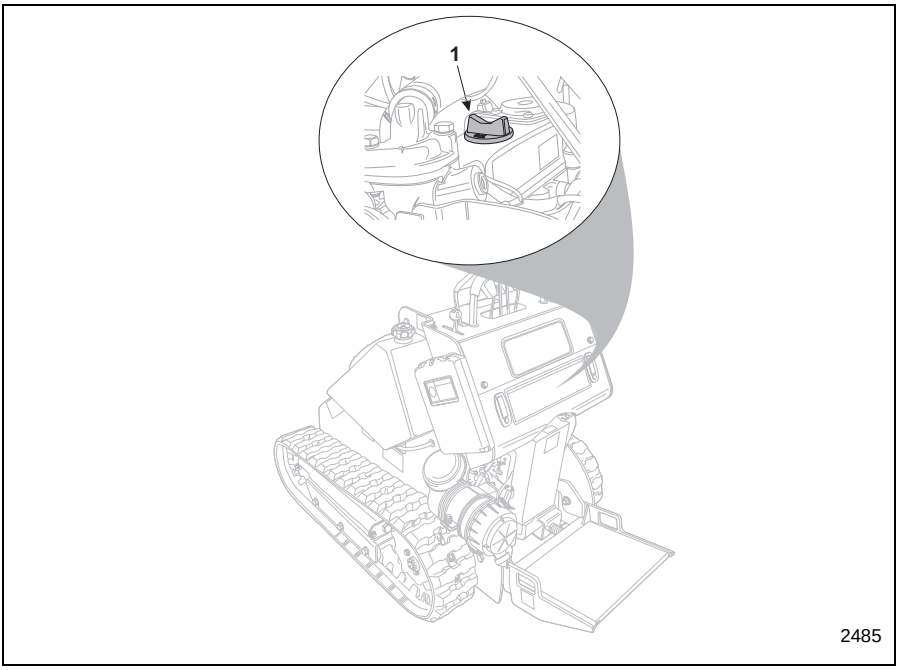


Figure 3–2 Engine Oil Filler Cap

NOTICE: Extremely dusty or dirty working conditions may require more frequent checking, filling and/or changing of engine oil.

- After filling the oil, wait a few minutes and check the oil level again.

NOTICE

Make sure to securely reinstall the dipstick into the dipstick tube before starting the engine.
Check engine fuel and fill as needed - be sure engine is OFF

3. The Boxer has one saddle fuel tank (Item 1, Figure 3–3). The tank has a fuel gauge located in the filler cap (Item 2, Figure 3–3). Remove cap and visually inspect fuel level to make sure that the indicator is showing the proper fuel level. Make sure that the tank has been filled on a daily basis.

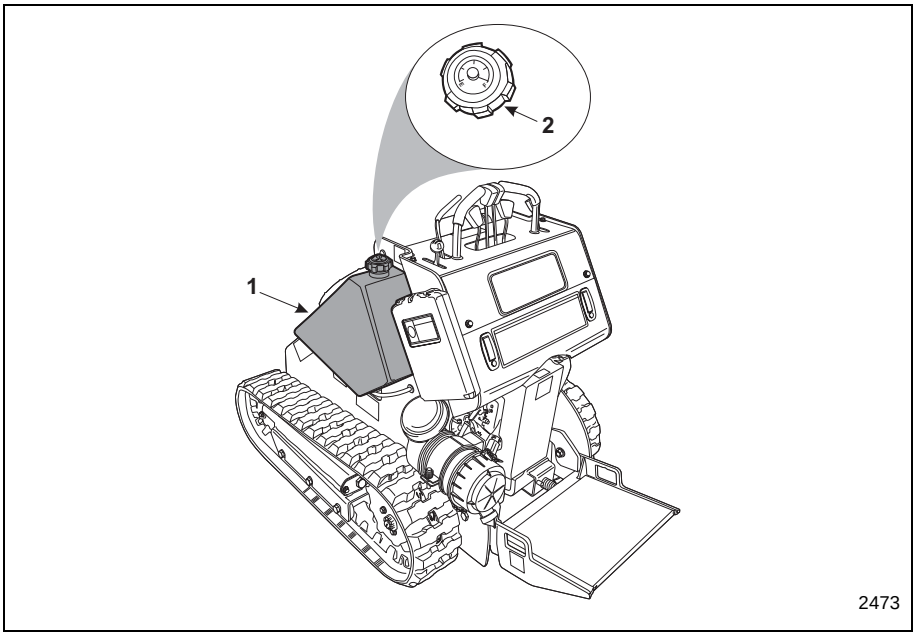


Figure 3–3 Fuel Level Check

- Carefully pour the fuel into the tank, not exceeding the max fill on the fuel gauge.

⚠ CAUTION

- **Allow engine to cool before filling fuel tank.**
- **Do not overfill because fuel could spill onto hot engine parts and ignite or explode.**

4. Check engine coolant level.

⚠ CAUTION

The coolant is hot and under pressure. DO NOT check until the engine radiator is cool to the touch.

- When the radiator is cool to the touch, remove the radiator cap (Item 1, Figure 3–4) and check the radiator fluid level. The proper coolant level is indicated by the Max Fill line on the decal (Item 2, Figure 3–4) located on the radiator filler tube.

NOTICE

- The overflow bottle is a non-pressurized container that is only for any high heat overflow. Do not add coolant to this container. It will not be drawn into the engine.
- If coolant is required, make sure to add the proper coolant as shown in the Engine Manual.

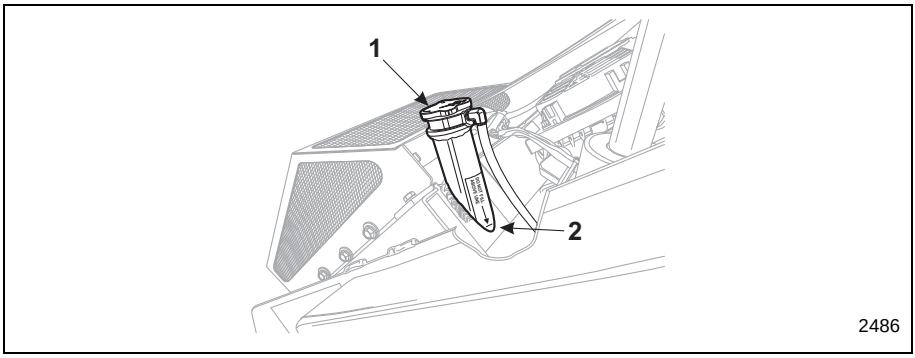


Figure 3–4 Engine Coolant Level Check

5. Inspect the radiator to make sure that the air flow is not blocked. The fan located on top of the unit is a suction fan, which draws air from inside the machine. Check the engine side of the radiator (Item 1, Figure 3–5) to make sure that debris has not been sucked against the radiator blocking air flow.

⚠ CAUTION

DO NOT check until the engine radiator is cool to the touch.

NOTICE: Some items in Figure 3–5 have been removed for clarity.

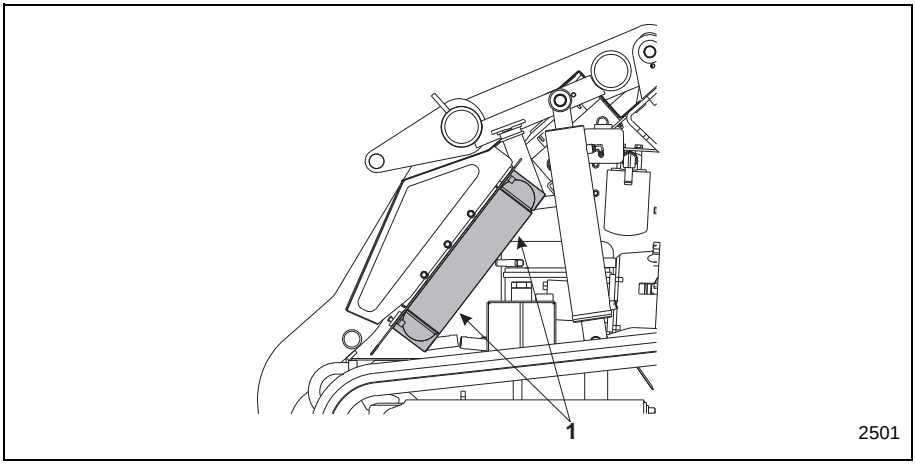


Figure 3–5 Radiator Air Flow Inspection

6. Check the fuel filter/water separator to make sure that there is no water in the filter bowl (Item 1, Figure 3–6).

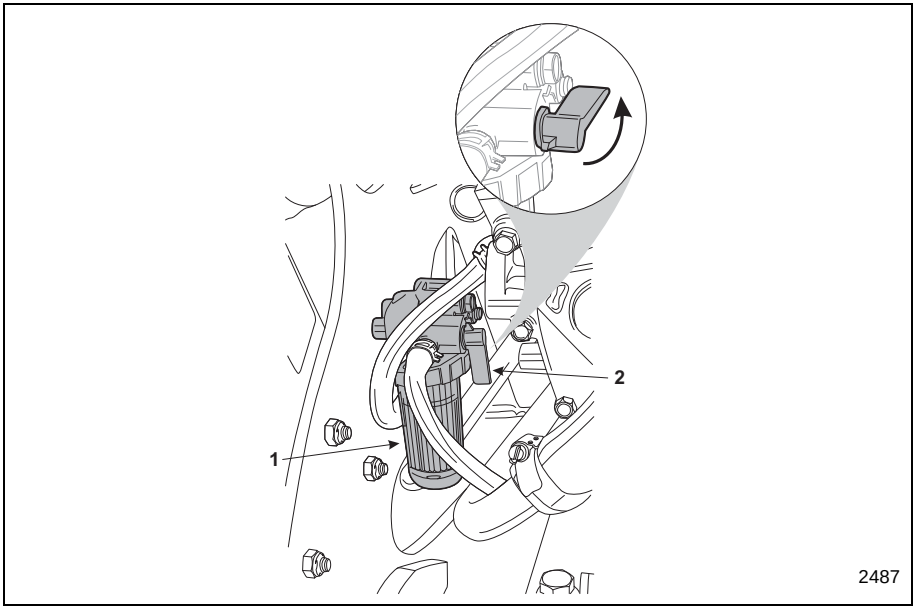


Figure 3–6 Engine Fuel Filter/Water Separator

⚠ CAUTION

- **Allow engine to cool before removing the filter bowl. Spilled fuel can potentially ignite or explode.**
- **Place a container underneath the filter assembly to catch any spilled fuel.**
- **Properly dispose of fuel according to State and Local regulations.**

If water needs to be removed;

1. Rotate the fuel shut off valve (Item 2, Figure 3–6) to stop the fuel flow from the tank.
2. Place a suitable sized container beneath the filter assembly to catch any spilled fuel.
3. Rotate the filter bowl (Item 1, Figure 3–6) and remove it from the filter assembly.
4. Dispose of the fuel and water in the bowl according to State and Local regulations.
5. Reinstall and secure the filter bowl.
6. Reopen the fuel valve.

NOTICE

If the fuel bowl does not fill with fuel, it may be necessary to air bleed the fuel system. See Section 4 – Fuel System Air Bleed instructions.

7. Release dirt from separator tube at the bottom of the air filter by squeezing the rubber dust ejector valve (Item 1, Figure 3–7) underneath the air filter.

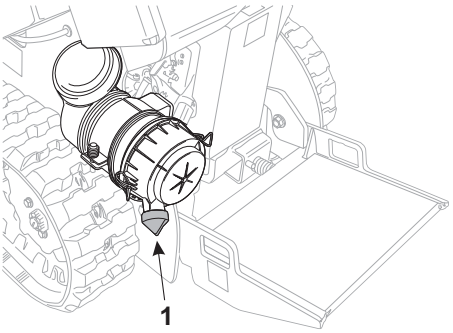


Figure 3–7 Release Dirt from Air Cleaner

8. Check all hydraulic hoses, lines and fittings.

⚠ WARNING

Hydraulic oil under pressure can penetrate body tissue causing serious injury and possible death. When troubleshooting a hydraulic system for leaks, always use cardboard or wood as a detector. DO NOT USE YOUR BARE HANDS. If you are injected with hydraulic oil or any other fluids, immediately seek treatment by a doctor trained in the treatment of penetrating fluid injuries.

- Visually inspect all of the hydraulic hoses, lines and fittings for signs of damage, wear or leaking.
- If any signs of damage are visible, do not operate the machine until repairs have been made.
- Some examples of common hydraulic hose damage are shown in Figure 3–8.

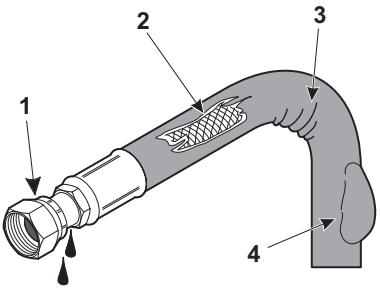


Figure 3–8 Hydraulic Hose Damage

1. End fittings damaged or leaking
2. Outer covering chafed or cut, and wire reinforcing is exposed
3. Hose shows signs of kinking or crushing
4. Outer covering ballooning

9. Check for loose or missing fasteners
   - Inspect for any loose or missing bolts.
   - Tighten or replace any missing bolts immediately.
10. While you are performing the daily maintenance, inspect the machine for any signs of damage, such as missing or damaged components, cracked welds, etc.
11. Check the track assemblies to make sure that:
   - The tracks are in good condition and are not showing any signs of wear.
   - Track tension is properly set.
   - Track drive motors are not leaking oil or hydraulic fluid.
12. Grease pivot shafts with proper type of grease. There are 10 grease points on this machine, see Figure 3–9.

⚠ CAUTION

Before starting the engine:

- **Move all hydraulic control levers forward and release the lever. Make sure that each lever automatically returns to the Neutral position.**
- **Move all hydraulic control levers rearward and release the lever. Make sure that each lever automatically returns to the Neutral position.**
- **The Auxiliary Control Lever will remain in the Reverse position until it is manually moved to the Neutral position.**
- **If any of the levers, other than the Auxiliary Control Lever, does not automatically return to the Neutral position, DO NOT use the machine until repairs have been completed.**

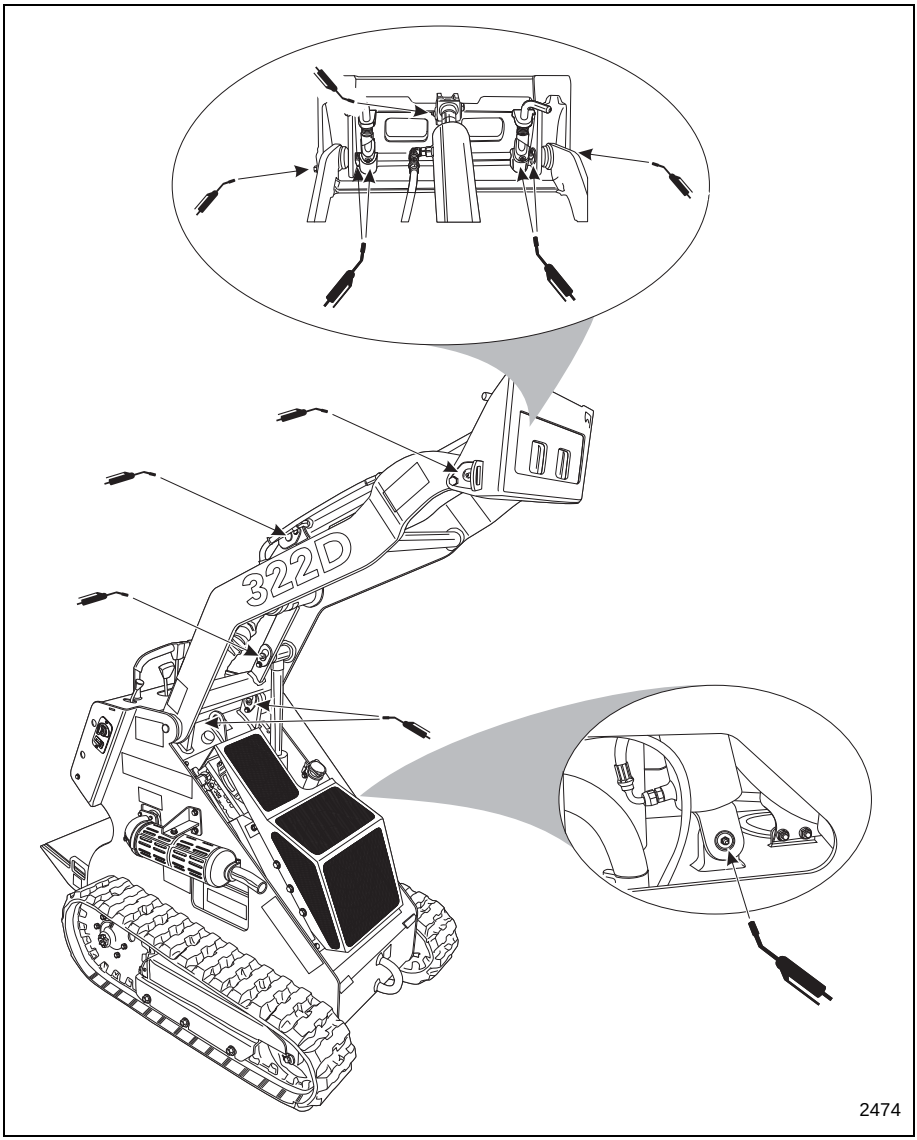


Figure 3–9 Lubrication Points

NOTICE: Extremely dusty or dirty working conditions may require more frequent service/ replacement.

⚠ CAUTION

Make sure to install the cylinder lock before performing any service work underneath the raised loader arm assembly.

Cylinder Lock Installation

1. Start the engine. (See Machine Start-up in this section for engine starting instructions.
2. Fully raise the loader arm.
3. Shut off the engine.
4. Release the cylinder lock from its storage position (Item 1, Figure 3–10) by removing the lock knob (Item 3, Figure 3–10) and pulling the safety lock pin (Item 2, Figure 3–10).
5. Place the cylinder lock (Item 5, Figure 3–10) onto the cylinder rod.
6. Fully reinsert the safety lock pin (Item 4, Figure 3–10), securing the cylinder lock in the support position. **NOTICE:** Make sure that the safety lock pin goes behind the loader arm cylinder rod.
7. Lower the loader arm assembly until it is supported by the cylinder lock.

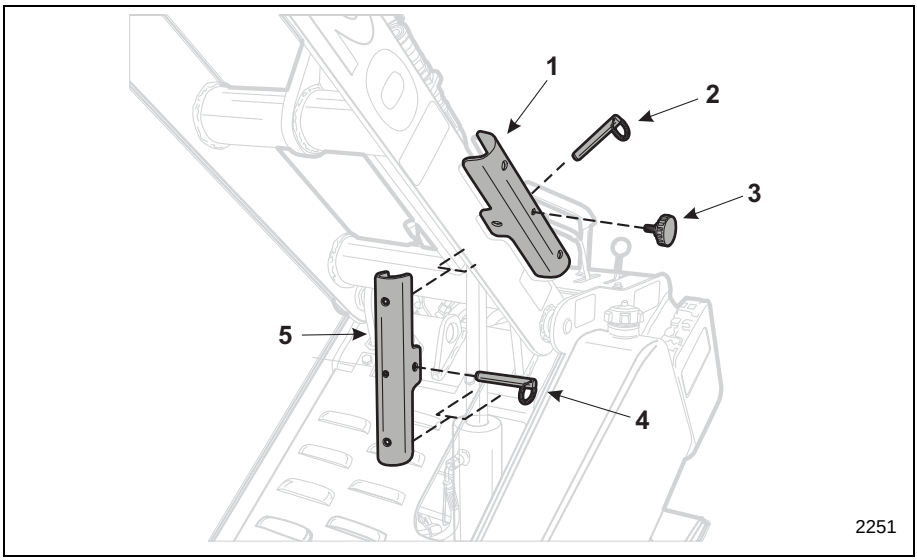


Figure 3–10 Safety Lock Installation

Cylinder Lock Removal

1. Start the engine and raise the loader arm to its full height.
2. Shut off the engine.
3. Pull the safety lock pin (Item 4, Figure 3–10) fully outwards.
4. Return the cylinder lock to the storage position (Item 1, Figure 3–10) on the loader arm.
5. Fully insert the safety lock pin (Item 2, Figure 3–10) and the lock knob (Item 3, Figure 3–10) to secure the cylinder lock in the storage position.

Operating Instructions

Machine Start-up

To start the machine, the operator must:

1. Stand on the operator's platform (Item 1, Figure 3–11).

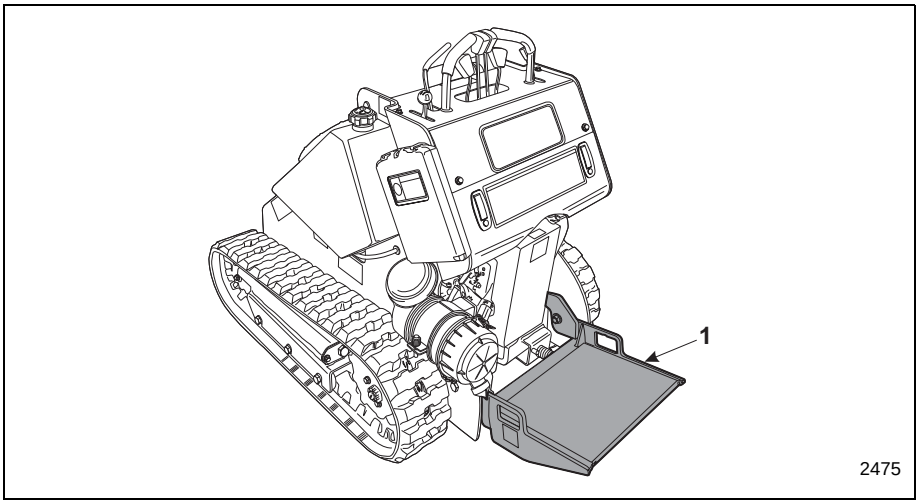


Figure 3–11 Operator's Platform

2. Move the throttle lever (Item 1, Figure 3–12) to about half way between fast and idle engine speeds.
3. Rotate the ignition key counterclockwise to the PREHEAT position (Item 3, Figure 3–12) to allow the glo-plugs to warm the engine cylinders for approximately 10 seconds.

NOTICE

The Low Engine Oil light and the warning sounder will turn on during this process. This is a normal condition and will verify that this warning system is functioning properly. If either the light or the warning sounder do not turn on, see Section 4 – Routine Service and Maintenance.

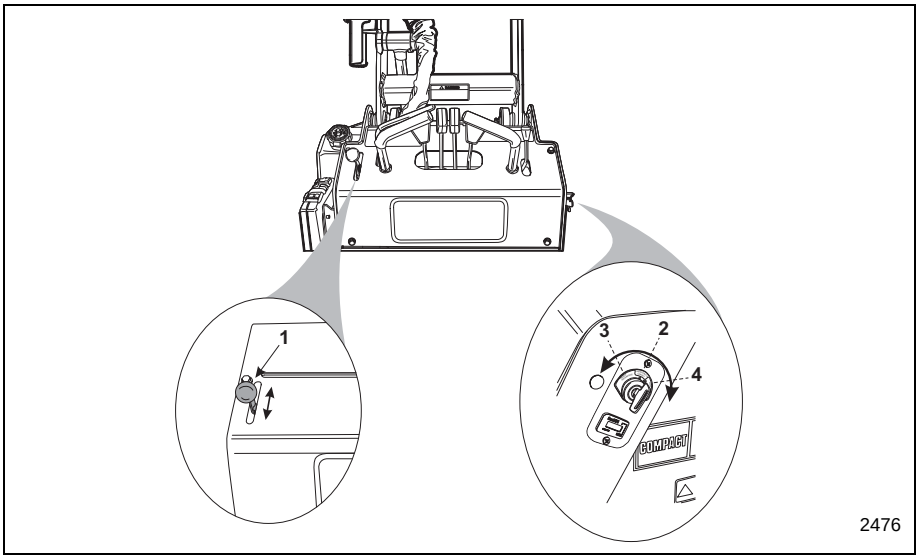


Figure 3–12 Engine Starting

4. Rotate the ignition key to the START position (Item 4, Figure 3–12) until the engine starts. The Low Engine Oil light and the warning sounder will turn on during this process. As soon as the engine starts, release the key. The key will return to the RUN position and the indicator light and sounder will turn off.

NOTICE

If either of the lights and sounder turn on while the machine is being operated, immediately stop all machine operations and shut the engine off.

5. Leave the throttle setting at about the halfway position and allow the engine to idle. This will begin warming the engine coolant and hydraulic oil.
6. In cold weather (32º F [0º C]) after about 5 minutes of engine idling, operate all of the main hydraulic controls to cycle warmed hydraulic oil through the hydraulic lines into the cylinders and hydraulic motors. Allow the engine to idle for another 5 minutes before beginning any machine operations.

⚠ WARNING

In extremely cold weather fully warm machine to prevent a possible machine run-away condition.

Machine Shut-down

To safely shut the machine down, the operator must:

1. Park the machine on a solid, level area.
2. Lower the loader arm and attachment to the ground.
3. Idle the engine for 5 - 10 minutes to allow the machine to cool down.
4. Shut off the engine.
5. Clean off any accumulated mud and/or dirt from the machines operating surfaces, i.e. operator's platform, both track assemblies, etc.

Transportation

1. Move the throttle control lever to the mid-range engine speed and set the transport speed to the LOW range. Raise the attachment so that it will clear the ramp of the transport trailer.
   NOTICE: The longer the attachment, like the trencher, the more the attachment needs to either be tilted ’or raised. It is recommended to back the machine onto the transport trailer and position the machine so that the heaviest weight (center of balance) is towards the front (hitch end) of the trailer. See Figure 3–13.

⚠ CAUTION

The Boxer is designed for maximum working balance. When traveling on an incline, always have the heaviest portion of the machine pointing uphill.

2. Follow general load carrying safety. Always carry the heaviest load pointing uphill.
   NOTICE: When operating without an attachment, the operator becomes the load.

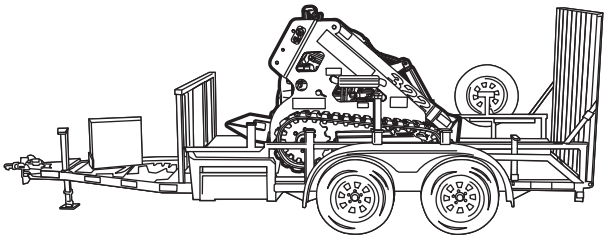


Figure 3–13 Transport Position on Trailer

3. When the machine is positioned on the trailer properly, lower the attachment to the trailer deck.
4. Shut the engine off and remove the key.
5. Secure the unit to the transport vehicle with DOT (Department of Transportation) approved chains, binders (Items 1 and 2, Figure 3–14), and DOT guidelines. Make sure to use the appropriate tie-down locations (Items 3 and 4, Figure 3–14) on the machine and trailer.

NOTICE:

- Never tow or pull the machine. Damage to the hydraulic motors could result.
- If the machine is totally in-operable, using lifting straps or cables and a machine that can safely lift 4,000 lbs (1820 Kg), lift the machine and place on a trailer. See “Lifting Procedures” on page 14.

⚠ WARNING

When transporting the machine, make sure to use DOT approved chains and binders (Item 1, Figure 3–15) to secure the machine to the "D" rings (Item 2, Figure 3–15) on the trailer. NOTICE: It is recommended to secure the machine through the ring on the front of the machine (Item 2, Figure 3–15) and through the two rings on the Operator's Platform (Item 4, Figure 3–15).

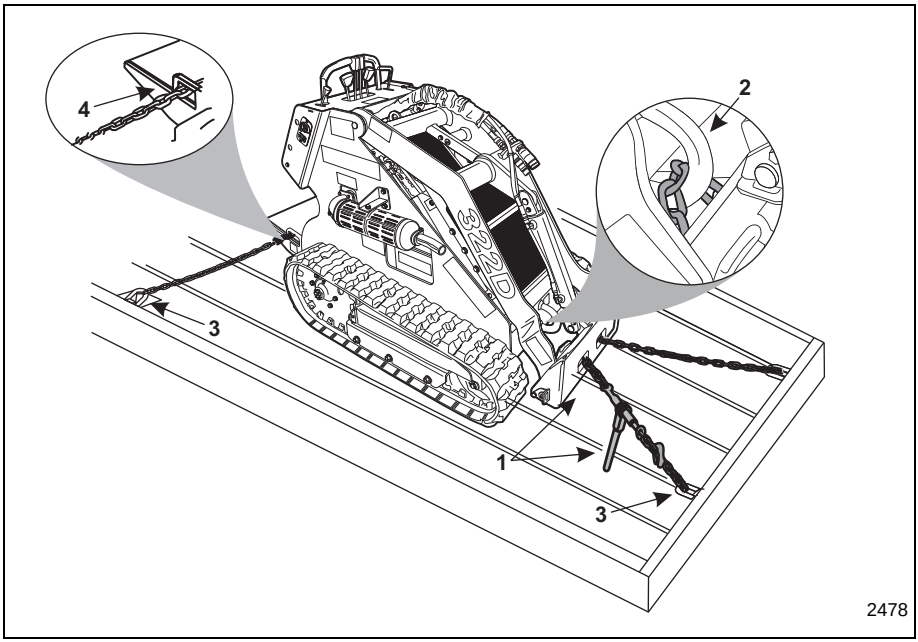


Figure 3–14 Travel Chains and Binders

Lifting Procedures

When it becomes necessary to lift the machine:

1. Use a lifting device that can safely lift 4,000 lbs (1820 Kg).
2. Use appropriate lifting chains (Item 1, Figure 3–15) that can safely lift 4,000 lbs (1820 Kg).
3. Route the chains through the lifting eye (Item 2, Figure 3–16) located directly in front of the operating controls.

⚠ CAUTION

- **Lift the machine approximately 12" to make sure that the machine is balanced before completing the lift.**
- **If lifting the machine with an attachment installed, the overall machine may not be balanced from front to back.**

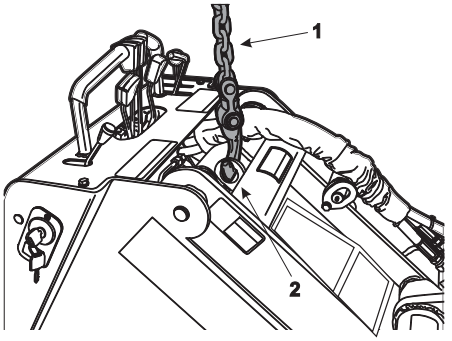


Figure 3–15 Machine Lifting

Machine Travel Controls

⚠ WARNING

- Levers and controls should return to the neutral position when they are released.
- Make sure that all of the controls are in the neutral (middle) position before starting the engine.
- Operate the controls gradually and smoothly. Excessive speed and quick control movements without regard for working conditions could cause an unsafe situation.
- Make sure to maintain your grip on both of the hand grips any time the machine is in motion.

NOTICE: Due to the spring tension system built into the track drive system as a safety mechanism, the machine can be put into an extreme situation during which the drive sprocket will bypass the rubber track guide holes causing a popping noise, called “cogging”. This situation is part of the track drive systems safety design, and indicates that this portion of the safety system is functioning properly.

The “cogging” condition is most likely to occur while operating in a reverse direction pulling a heavy load, and during the first 50 hours of track usage. It is caused by the tension spring being fully compressed due to high track load.

If a cogging condition occurs, immediately stop machine travel and auxiliary functions and reverse travel direction slightly to de-compress track tension. Continued cogging will cause the track drive sprocket to seat into the rubber track incorrectly, and cause damage to the track. If cogging occurs, stop travel function and check for and remove any debris or foreign matter in the drive system, check track for proper tension as shown in Section 4 of this manual, and resume operation.

Forward Travel

Push both control levers forwards to travel straight forward. The farther these are moved, the faster the machine will travel. See Figure 3–16.

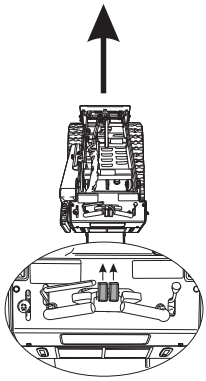


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Figure 3–16
Forward Travel

Reverse Travel

Pull both control levers backwards to travel straight backwards. The farther these are moved, the faster the machine will travel. See Figure 3–17.

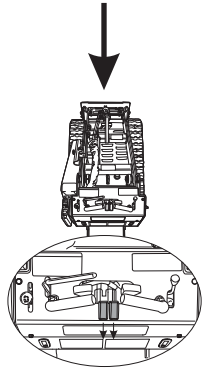

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Figure 3–17
Reverse Travel

Right Turn During Forward Travel

To turn to the right, move the left hand control lever farther forward than the right control lever. The farther forward the left control is moved, the faster the right turn will be made. See Figure 3–18.

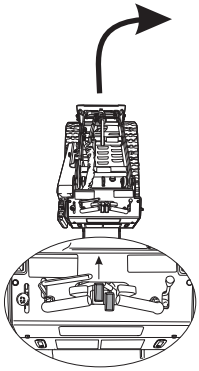

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Figure 3–18
Right Hand Turn
in Forward

Left Turn During Forward Travel

To turn to the left, move the right hand control lever farther forward than the left control lever. The farther forward the right control is moved, the faster the left turn will be made. See Figure 3–19.

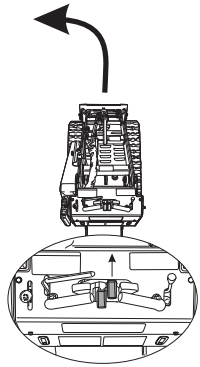

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Figure 3–19
Left Hand Turn
in Forward

Right Turn During Reverse Travel

Move the left hand control lever farther backward than the right control lever. The farther forward the left control is moved, the faster the right turn will be made. See Figure 3–20.

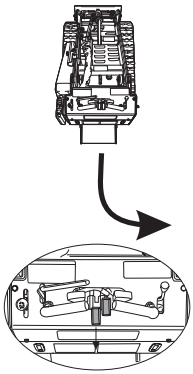

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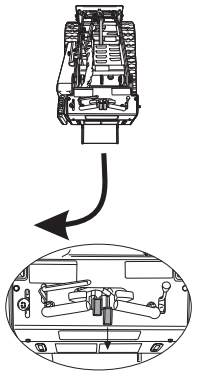
Figure 3–20
Right Hand Turn
in Reverse

Left Turn During Reverse Travel

Move the right hand control lever farther backwards than the left control lever. The farther forward the right control is moved, the faster the left turn will be made. See Figure 3–21.



2280

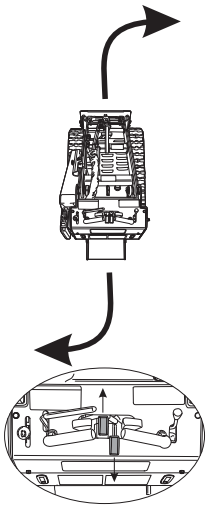
Figure 3–21
Left Hand Turn
in Reverse

Spin Turn

⚠ CAUTION

Make sure to use the machine hand holds while doing a spin turn to maintain your balance.

Move the travel control levers in opposite directions to spin the machine on it axis. To spin left, move the right control lever forward while pulling the left control lever backwards; to spin turn to the right, push the left control lever forwards and while pulling the right control lever backwards. Figure 3–22.



2281

Figure 3–22 Spin Turn

⚠ WARNING

- **Do not travel up or across a slope steeper than 15°. See Figure 3–23.**
- **Make sure that the tracks are extended to their widest position, providing the broadest stance for the machine.**
- **Keep attachments as low as possible when traveling on slopes or rough terrain.**

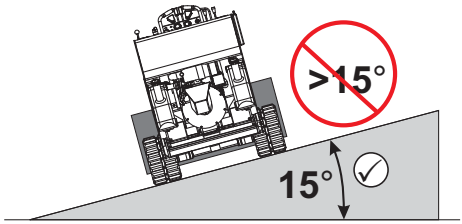


Figure 3–23 Slide Slope Travel

- **Keep the heavy end of the machine towards the uphill direction when traveling up or down a slope. NOTICE: When the machine has no attachment or load, the heavy end is the operator's platform end of the machine. See Figure 3–24.**

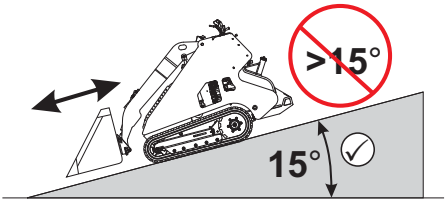


Figure 3–24 Uphill/Downhill Travel

Attachment Installation and Removal

Attachment Lock Pins

The mounting plate located at the front of the machine provides for the easy installation and safe use of the wide variety of available attachments. This system is very easy to use, but requires the proper use of the attachment lock pins. There are two positions for the attachment lock pins, the unlocked position and the locked position.

Once the machine has picked up an attachment, shut off the engine and rotate the attachment locks into the “locked” position (Item 1, Figure 3–25). As you rotate the lock pin, it will drop downwards, securing the attachment to the machine. If the lock pin does not drop into the locked position, start the engine and tilt the attachment slightly forwards or backwards until the lock pins snap into place.

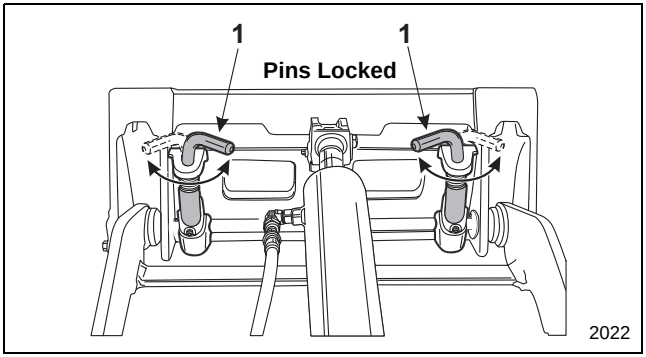


Figure 3–25 Attachment Locks in Locked Position

⚠ CAUTION

Until the attachment lock pins are fully in the locked position, the attachment has not been safely secured to the machine. Do not stand near the attachment until it is fully secured to the machine.

To release an attachment, rotate the attachment locks to the “unlocked” position (Item 1, Figure 3–26). The lock pins will automatically rise, releasing the attachment from the machine. If the pins do not release the attachment or are very hard to rotate, start the engine and tilt the attachment slightly forwards or backwards until the pins can be rotated.

⚠ CAUTION

Make sure to keep your hands and feet away from the attachment during the unlocking process. As the attachment becomes free from the machine, it may move.

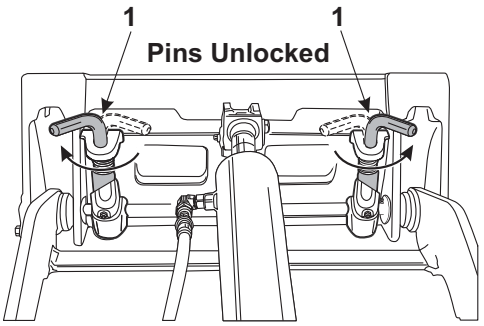


Figure 3–26 Attachment Locks in Unlocked Position

Installation of Non-Hydraulically Powered Attachments

There are many available attachments that are very easy to install. To install any of the non-hydraulically powered attachments:

1. Position the attachment on a level surface.

   NOTICE: Clean the inside lower edge of the female attachment mounting plate to remove any debris that might interfere with the attachment installation.

2. Start the machines engine, lower the loader arm and tilt the mounting plate forwards.

   NOTICE: Make sure that both of the attachment lock pins (Item 1, Figure 3–26) are in the "unlocked" position. See Attachment Lock Pins earlier in this section.

3. Slowly drive towards the attachment and align the top edge of the male mounting plate (Item 1, Figure 3–27) and the upper lip of the female attachment mounting plate (Item 2, Figure 3–27). Tuck the upper edge of the male mounting plate into the upper lip of the female attachment mounting plate.

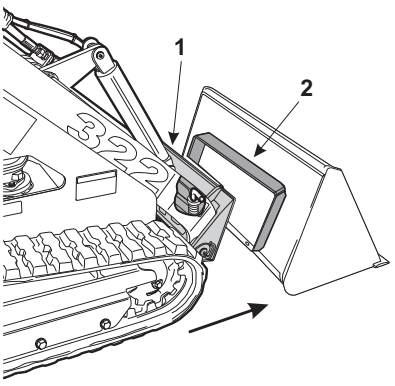


Figure 3–27 Non-powered Attachment Installation

4. When the machines mounting plates top edge is seated in the attachment mounting plate, curl the machines mounting plate backwards slightly to allow the lower edge of the machines mounting plate to slide into position. See Figure 3–28.

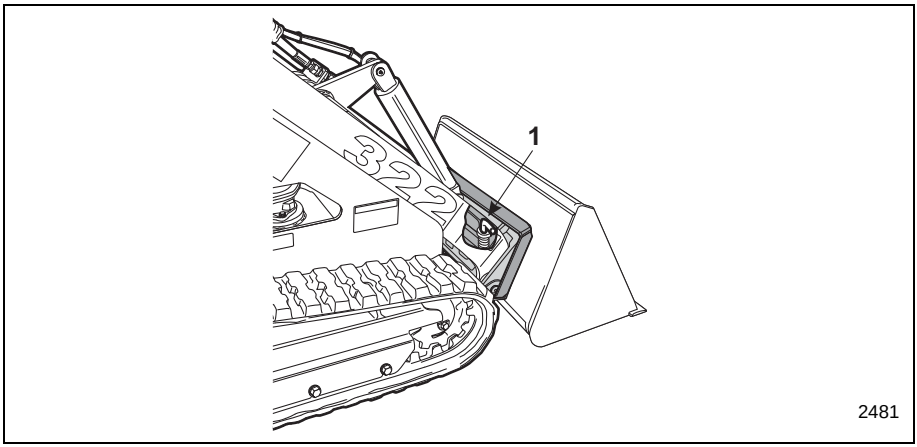


Figure 3–28 Attachment Installed

5. Shut the engine off.
6. Rotate the attachment lock pins (Item 1, Figure 3–28 and Item 1, Figure 3–29) into the locked position, securing the attachment to the machine.

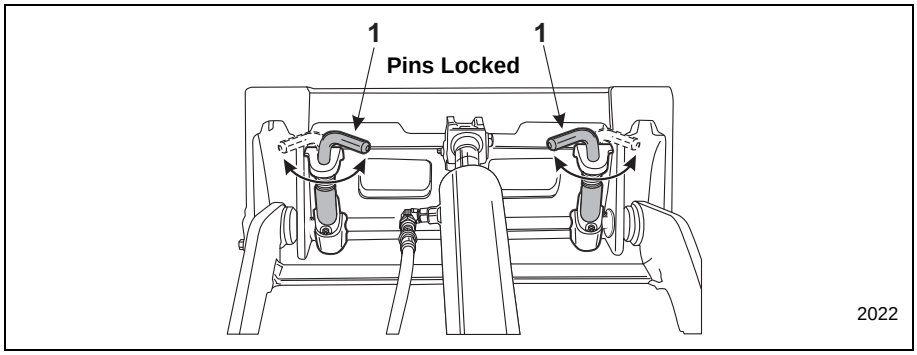


Figure 3–29 Attachment Locks in Locked Position

7. Start the engine and raise the attachment off the ground. Visually inspect the bottom edge of the attachments mounting plate to make sure that both of the attachment lock pins are securely holding the attachment in position.

⚠ CAUTION

DO NOT go underneath the attachment when it is raised.

Removal of Attachment

1. Lower the attachment onto a firm, level surface.
2. Shut off the machine engine.
3. Rotate the attachment lock pins to the UNLOCKED position (Item 1, Figure 3–30).

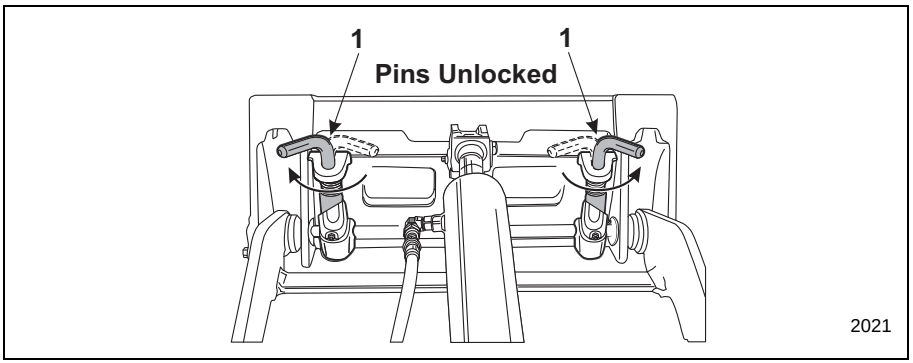


Figure 3–30 Attachment Locks in Unlocked Position

4. Start the engine and rotate the mounting plate downwards.
5. Back away from the attachment.

   NOTICE: It may be necessary to lower the loader arm assembly slightly to fully disengage from the attachment.

Installation of Hydraulically Powered Attachments

There are many hydraulically powered attachments available that are very easy to install. To install any of these attachments:

1. Position the attachment on a level surface.

   NOTICE: Clean the lower edge of the female attachment mounting plate to remove any debris that might interfere with the attachment installation.

2. Start the machine engine, lower the loader arm and tilt the mounting plate forwards.

   NOTICE: Make sure that both of the attachment lock pins (Item 1, Figure 3–31 and Item 3, Figure 3–32) are in the “unlocked” position.

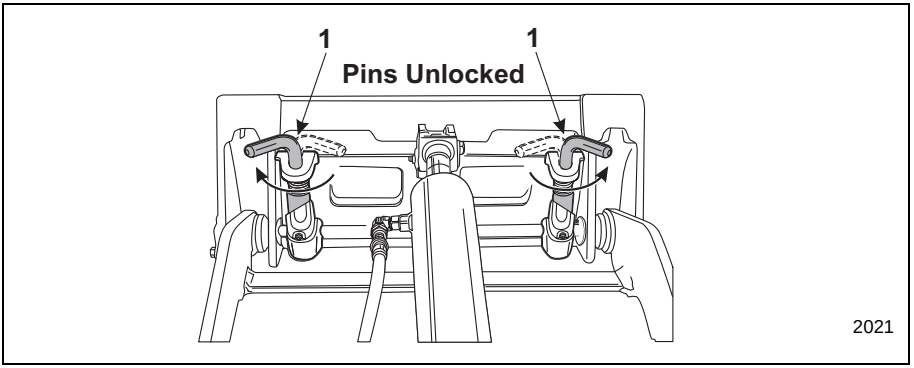


Figure 3–31 Attachment Locks in Unlocked Position

3. Slowly drive towards the attachment and align the top edge of the male mounting plate (Item 1, Figure 3–32) and the upper lip of the female attachment mounting plate (Item 2, Figure 3–32).

   NOTICE: Make sure to position the attachments hydraulic hoses (Item 4, Figure 3–32) so that they are not damaged during the installation process. Tuck the upper edge of the male mounting plate into the upper lip of the female attachment mounting plate.

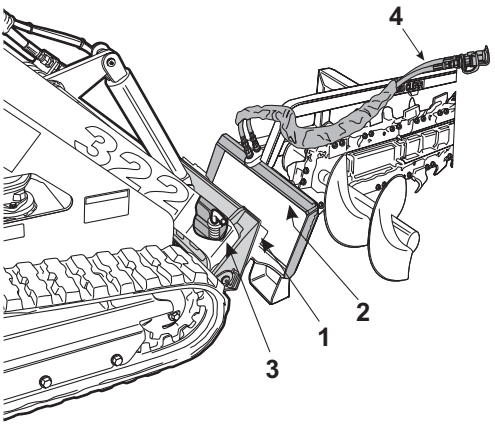


Figure 3–32 Hydraulically Powered Attachment Installation

4. When the machines mounting plates top edge is seated in the attachment mounting plate, curl the machines mounting plate backwards slightly to allow the lower edge of the machines mounting plate to slide into position. See Figure 3–33.

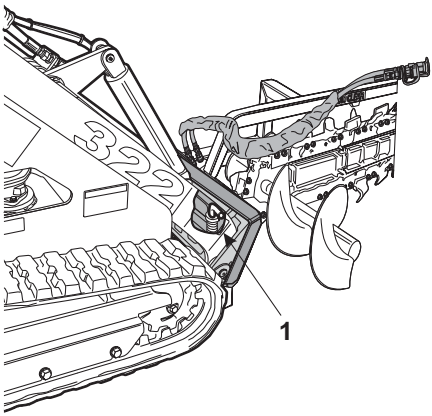


Figure 3–33 Hydraulically Powered Attachment Installed

5. Shut the engine off.
6. Rotate the attachment lock pins (Item 1, Figure 3–33, Item 1, Figure 3–34) into the locked position securing the attachment to the machine.

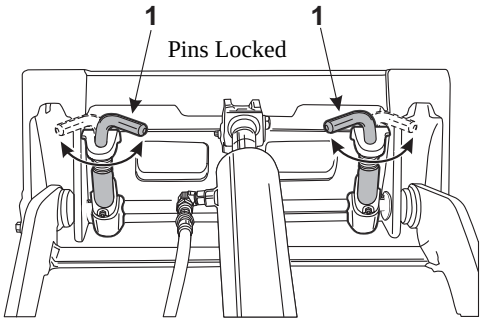


Figure 3–34 Attachment Locks in Locked Position

7. Start the engine and raise the attachment off the ground. Visually inspect the bottom edge of the attachments mounting plate to make sure that both of the attachment lock pins are securely holding the attachment in position.

⚠ CAUTION

DO NOT go underneath the attachment when it is raised.

8. Shut off the engine.
9. Move any of the main hydraulic controls forward and backward to release any stored hydraulic pressure.
10. Attach the hydraulic hoses to the quick connects. See Figure 3–35.

NOTICE

Make sure that the engine has been shut off before beginning this procedure.

a. Move the AUXILIARY control lever (Item 1, Figure 3–35) either towards the hand grip or backwards into the REVERSE detent position. This will release the hydraulic pressure locked in the auxiliary hydraulic lines. Leave the control lever in the detent position.

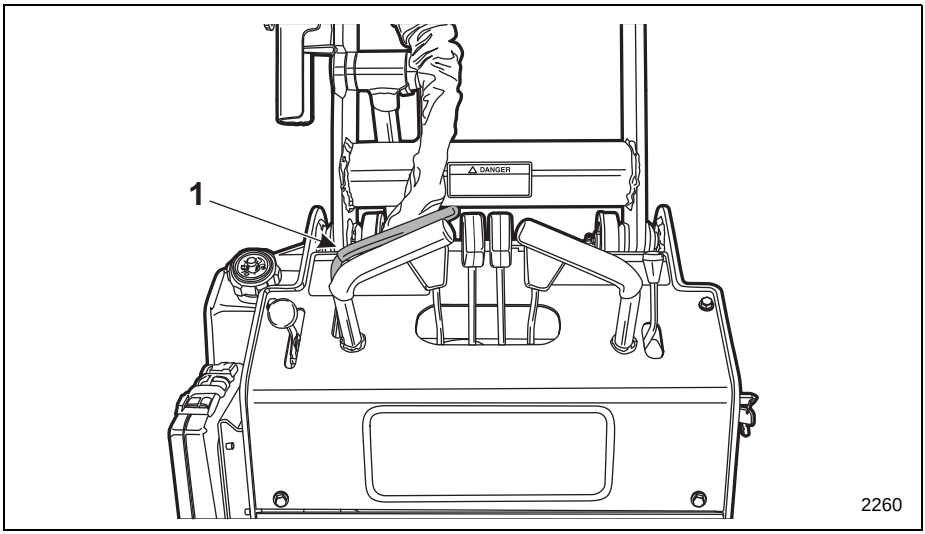


Figure 3–35 Auxiliary Control Lever

b. Remove the protective covers (Items 4, Figure 3–36) from the attachment quick connectors.

c. Wipe off the end of each of the connectors (Items 1, 2, 3, 4, Figure 3–36) to remove any dirt or debris.

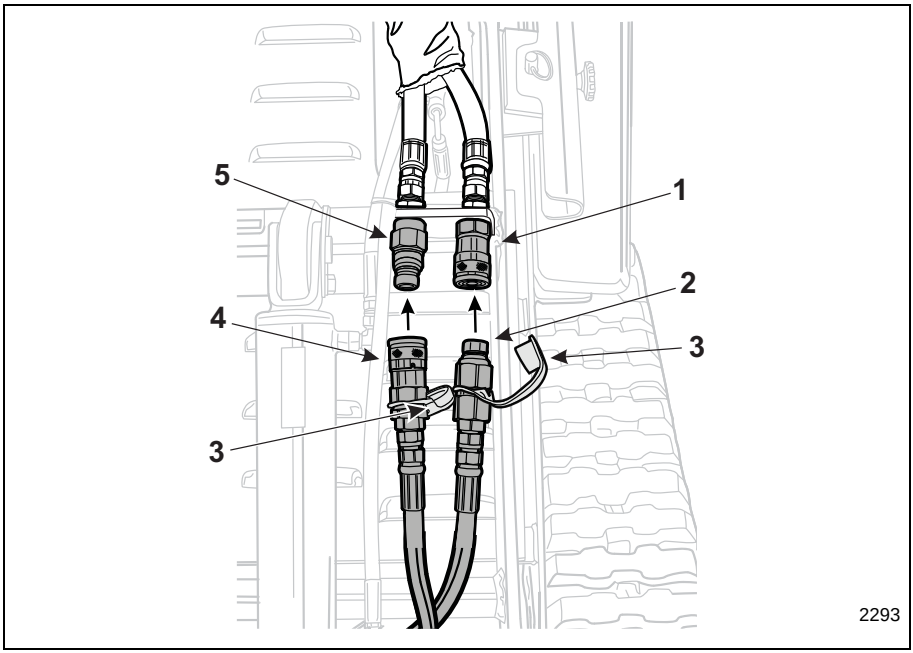


Figure 3–36 Auxiliary Hydraulic Quick Connects

d. Insert the attachments' male coupling (Item 3, Figure 3–36) into the female bulkhead quick connect coupling (Item 2, Figure 3–36) on the machine and push until the connector locks into position.

e. Repeat the above process to connect the attachments' female quick connect (Item 5, Figure 3–36) on the other hose to the mae bulkhead connector (Item 1, Figure 3–36) on the machine.

f. Check the security of both connections by gently tugging on the attachment hoses to make sure that the quick connects are seated properly.

11. Make sure that the hydraulic hoses are routed so that they will not be in the way or damaged during machine operation. Figure 3–37 shows how the hoses might be routed to keep them out of the way during operation and prevent them from being damaged.

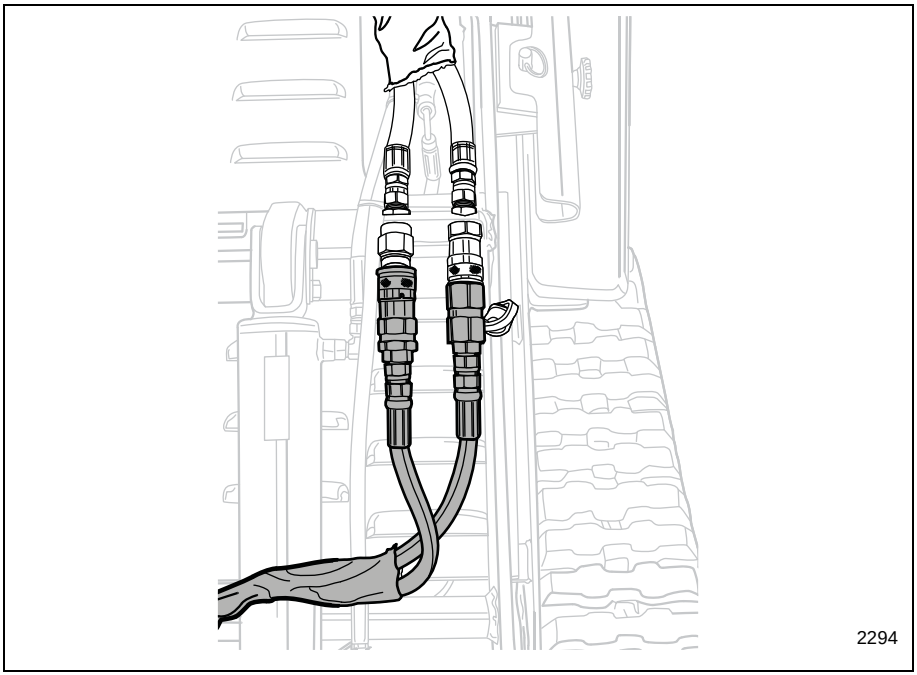


Figure 3–37 Attachment Hydraulic Hose Routing

12. The attachment is now ready to use.

⚠ CAUTION

Before starting the engine, make sure that the Auxiliary Hydraulic control lever is in the NEUTRAL position. If this control is left in either the forward or reverse position and the engine is started, the attachment will begin to function.

Operating Instructions for a Hydraulic Attachment

1. Move the engine throttle to the full speed setting. Raise the attachment off the ground and position it for use.
2. Move the HI/LOW selector lever (Item 2, Figure 3–38) to either the high speed or low speed setting depending on the attachment to be used. This setting will control both the functional speed of the attachment as well as machine travel speed.

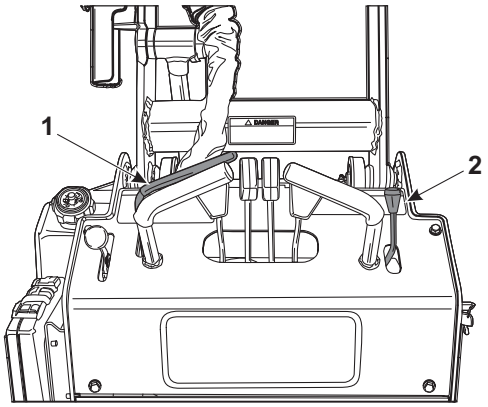


Figure 3–38 Auxiliary Attachment Controls

3. With your left hand, squeeze the AUXILIARY/OPERATOR PRESENCE control lever (Item 1, Figure 3–38) towards the hand grip to activate the FORWARD motion of the attachment.

   NOTICE: The AUXILIARY/OPERATOR PRESENCE lever is spring loaded and when released, will automatically move from the FORWARD motion position to NEUTRAL, stopping the attachments motion. The engine will continue to run.

NOTICE

When using an attachment that will require the machine to move, such as with a trencher or tiller, it is recommended to set the HI/LOW selector lever to the LOW speed position.

4. Lower the attachment to begin work.

   NOTICE: If you want to reverse the operation of the attachment, move the AUXILIARY/OPERATOR PRESENCE lever (Item 1, Figure 3–36) to the REVERSE position. The control lever will remain in the REVERSE position detent until it is moved to the NEUTRAL position.

⚠ CAUTION

- **Make sure not to travel to fast for operating conditions when using a trencher, tiller or other attachment that requires the machine to move.**
- **Stop all machine travel before releasing the AUXILIARY/OPERATOR PRESENCE lever.**

5. When using a trencher, tiller or other attachment that requires the machine to move while the attachment is in operation, move the travel control levers slightly in either the forward or reverse position. Using too fast a travel speed can create an unsafe operating condition or cause damage to the machine. If the engine begins to labor or stalls, release the travel controls completely until the engine returns to full operating power.

Removal of Hydraulically Powered Attachments

⚠ CAUTION

After use, the quick couples and hydraulic fluid will be very hot. Wear gloves when disconnecting the auxiliary hydraulic lines.

To remove a hydraulically powered attachment;

1. Lower the attachment to the ground and shut off the engine.
2. Move the hydraulic control lever forward or backward to release any stored hydraulic pressure.
3. Some of the female couplings will have a lock button preventing accidental disconnection. To release this type of quick connect, rotate the collar on the female quick connect (Item 1, Figure 3–39) to align the notch on the collar with the lock button (Item 2, Figure 3–39).
4. Slide the collar backwards on the female quick connect (Item 4, Figure 3–39) until it stops against the lock button. The male connector will be released. Move the attachment hose away from the bulkhead fitting.
5. If the female connector does not have the lock pin type collar, just slide the collar backwards until the male connector is released.

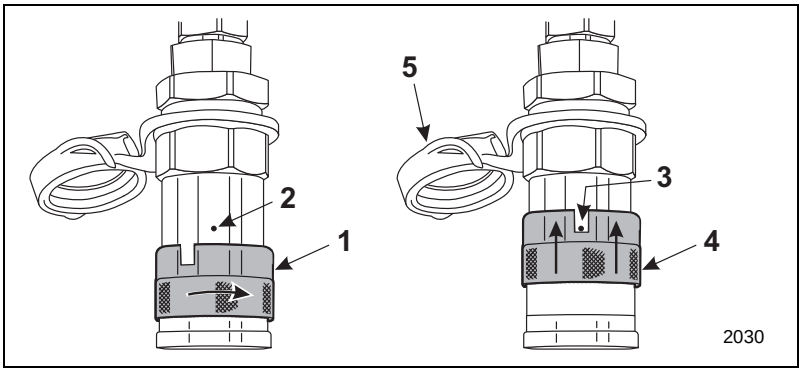


Figure 3–39 Quick Connect Locking Collar

6. Repeat this procedure on the other hydraulic line.
7. Cover the hose connections with the dust caps (Item 5, Figure 3–39) and store the hydraulic hoses to prevent damage.
8. Follow the instructions in “Removal of Attachment” earlier in this section to complete the attachment removal.

Section 4 – Routine Service and Maintenance

The following information presents the routine service and maintenance required to make sure that the machine functions safely and properly. More detailed service information is contained in the Service Manual.

Table 1: Service Cycle Table

Activity	Daily (10 Hours)	50 Hours	200 Hours	400 Hours
Safety Placards	✓ and R			
Fuel	✓ and A			
Engine Oil	✓ and A	R*	R**	
Engine Oil Filter		R*	R**	
Engine Coolant	✓ and A	C**		
Engine Radiator	✓***			
Air Filter	✓		R**	R**
Fuel Filter/Water Separator	✓	✓	R**	
Engine Idle Speed				✓
Check and Clean Battery Terminals and Battery		✓	✓	
Hydraulics				
- Hydraulic Filter				R**
- Hydraulic Fluid Level	✓ and A			R**
- Hydraulic Hoses	✓			
Grease	✓***			
Tracks	✓			
Visual Check for Loose/Missing Fasteners	✓			
Check and Adjust Track Tension	✓			

Service Cycle - R = Replace ✓ = Check A = Add C = Clean

* First 50 operational hours, then follow normal service cycle.

** Extremely dusty or dirty working conditions may require more frequent service/replacement.

***Under very wet and muddy conditions, more frequent lubrication may be required.

Daily Maintenance Procedures

Do the following procedures daily or every 10 operating hours:

1. Check condition of all warning and instructional decals. Before operating the machine, replace any missing or damaged decals.

   NOTICE: Make sure to read and understand all WARNING and SAFETY decals before operating the machine.

2. Check engine fuel and fill as needed - be sure engine is OFF

   a. The Boxer has one saddle tank (Item 1, Figure 4–1), on the left side of the machine.

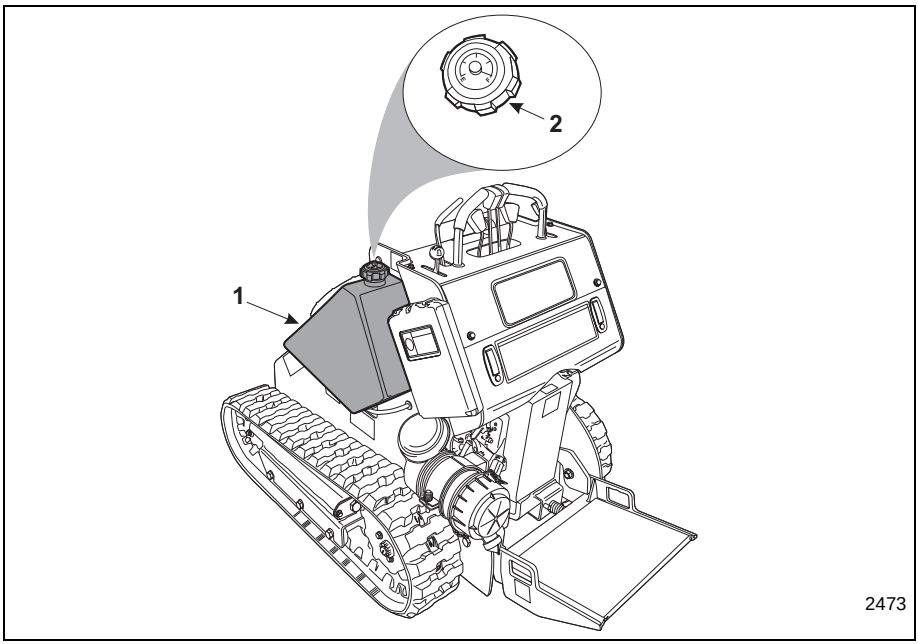


Figure 4–1 Fuel Level Check

   b. The fuel tank has a fuel gauge located in the filler cap (Item 2, Figure 4–1). Remove cap and visually inspect fuel level to make sure that the indicator is showing the proper fuel level. Make sure that the tank has been filled on a daily basis.

   Carefully pour diesel fuel into the tank, not exceeding the max fill indication shown by the gauge in the fuel cap.

⚠ CAUTION

- **Allow engine to cool before filling fuel tanks.**
- **Do not overfill because fuel could spill onto hot engine parts and ignite or explode.**

3. Check engine oil -
   a. Make sure that the engine is OFF.
   b. Pull out dipstick (Item 1, Figure 4–2) and look for both the full and add oil lines. The correct level is between those two lines.

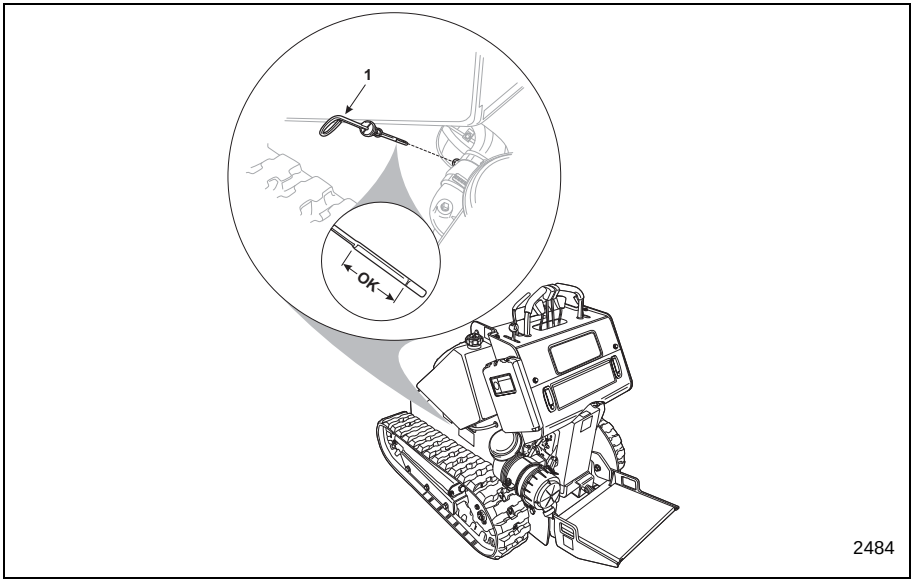


Figure 4–2 Oil Level Check

   c. If the engine oil level is below the add line, carefully add the proper amount of oil through the engine oil filler (Item 1, Figure 4–3) To reach the oil filler cap, remove the lower locking service panel. It is important to add the correct type of engine oil as stated in the engine manual.

   NOTICE: Make sure to reinstall and secure the oil filler cap.

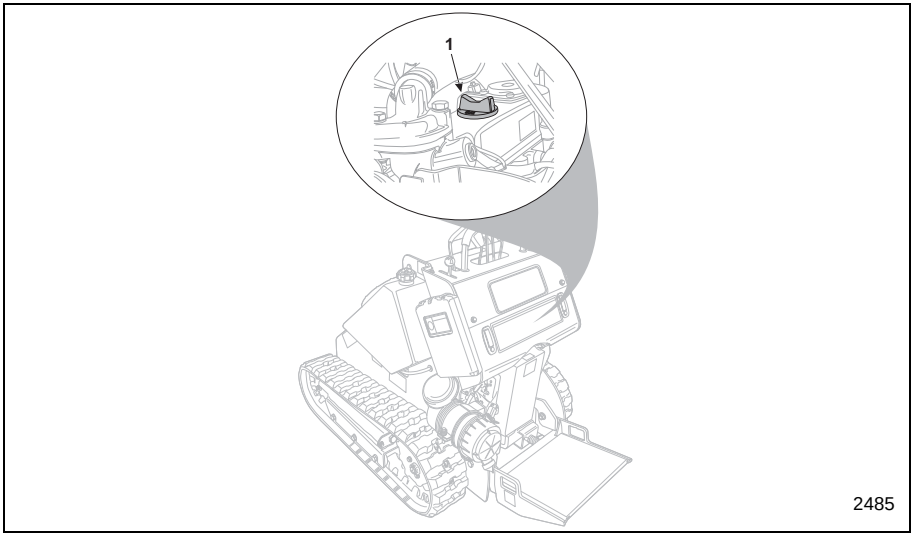


Figure 4–3 Engine Oil Filler Cap

NOTICE: Extremely dusty or dirty working conditions may require more frequent checking, filling and/or changing of engine oil.

d. After filling the oil, wait a few minutes and check the oil level again.

4. Check engine coolant level.

⚠ CAUTION

The coolant is hot and under pressure. DO NOT check until the engine radiator is cool to the touch.

- When the radiator is cool to the touch, remove the radiator cap (Item 1, Figure 4-4) and check the radiator fluid level. The proper coolant level is indicated by the Max Fill line on the decal (Item 2, Figure 4–4) located on the radiator filler tube.

NOTICE

- The overflow bottle is a non-pressurized container that is only for any high heat overflow. Do not add coolant to this container. It will not be drawn into the engine.
- If coolant is required, make sure to add the proper coolant as shown in the Engine Manual.

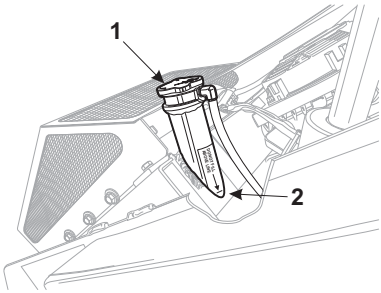


Figure 4–4 Engine Coolant Level Check

5. Inspect the radiator to make sure that the air flow is not blocked. The fan located on top of the unit is a suction fan, which draws air from inside the machine. Check the engine side of the radiator (Item 1, Figure 4–5) to make sure that debris has not been sucked against the radiator blocking air flow.

⚠ CAUTION

DO NOT check until the engine radiator is cool to the touch.

NOTICE: Some items in Figure 4–5 have been removed for clarity.

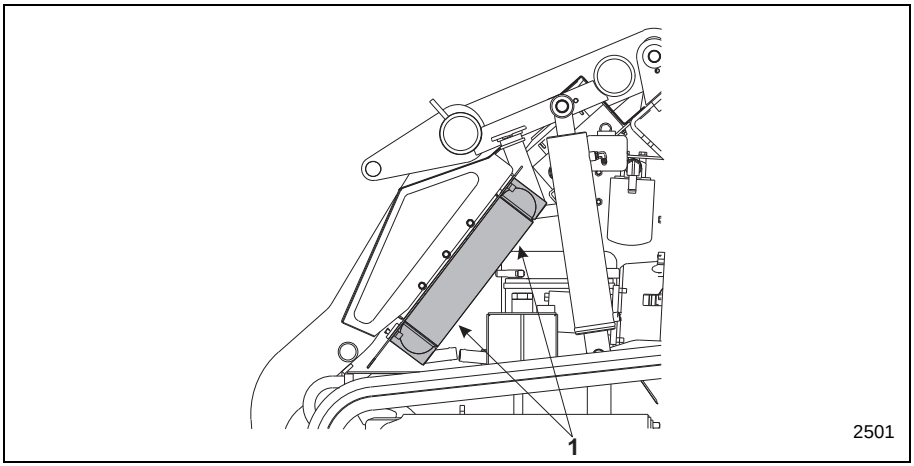


Figure 4–5 Radiator Air Flow Inspection

6. Check the fuel filter/water separator to make sure that there is no water in the filter bowl (Item 1, Figure 4–6).

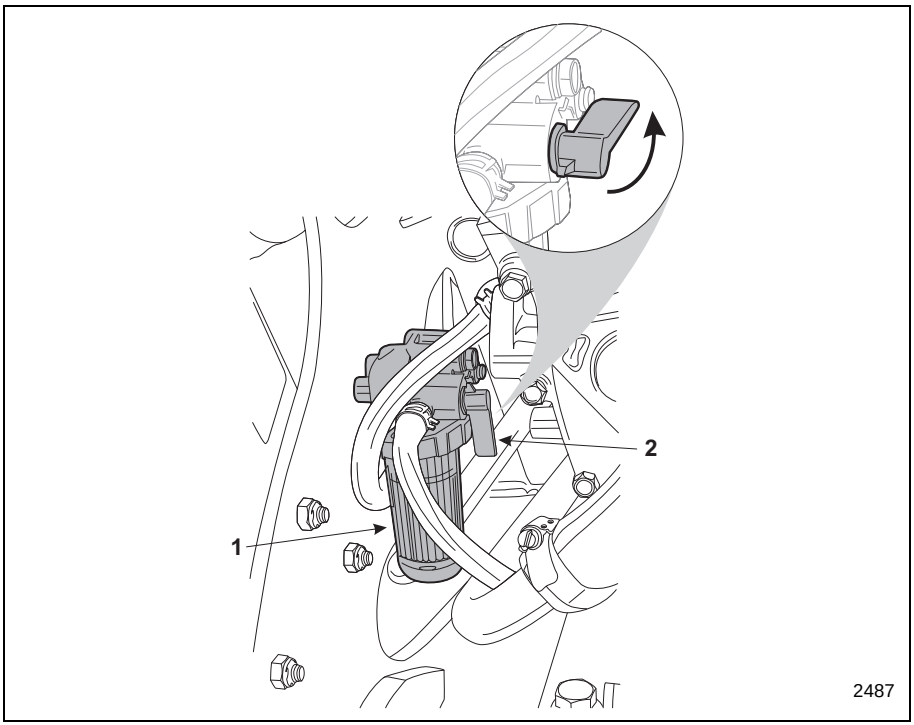


Figure 4–6 Engine Fuel Filter/Water Separator

⚠ CAUTION

- **Allow engine to cool before removing the filter bowl. Spilled fuel can potentially ignite or explode.**
- **Place a container underneath the filter assembly to catch any spilled fuel.**
- **Properly dispose of fuel according to State and Local regulations.**

If water needs to be removed;

1. Rotate the fuel shut off valve (Item 2, Figure 4–6) to stop the fuel flow from the tank.
2. Place a suitable sized container beneath the filter assembly to catch any spilled fuel.
3. Rotate the filter bowl (Item 1, Figure 4–6) and remove it from the filter assembly.
4. Dispose of the fuel and water in the bowl according to State and Local regulations.
5. Reinstall and secure the filter bowl.
6. Reopen the fuel valve.

NOTICE

If the fuel bowl does not fill with fuel, it may be necessary to air bleed the fuel system. See Fuel System Air Bleed instructions later in this section.

7. Release dirt from separator tube at the bottom of the air filter by squeezing the rubber dust ejector valve (Item 1, Figure 4–7) underneath the air filter.

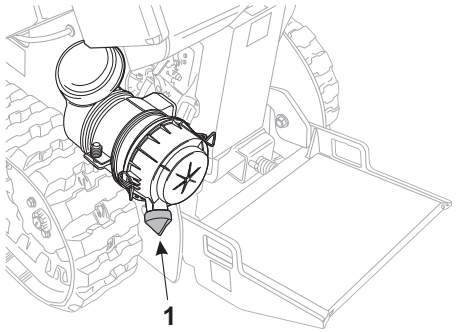


Figure 4–7 Release Dirt from Air Cleaner

8. Check hydraulic oil level, fill as needed with the proper hydraulic oil - be sure engine is OFF.
   a. Unscrew the dipstick assembly and remove from the machine. (1, Figure 4–8)
   b. Make sure that the hydraulic fluid is between the marker holes in the dip stick.

⚠ CAUTION

If you are checking the fluid level after a period of use, the hydraulic system and hydraulic fluid will be very hot. Wear gloves when inspecting the hydraulic fluid level.

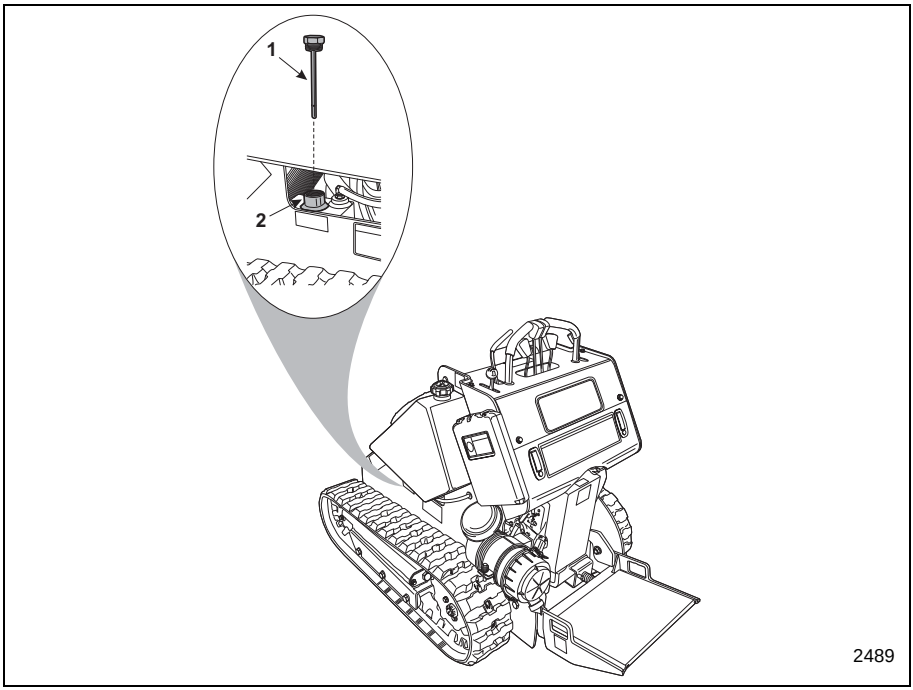


Figure 4–8 Hydraulic Fluid Level Dip Stick

   c. Add the proper hydraulic fluid (Chevron Rykon Premium ISO 46 hydraulic fluid or equivalent) through the filler port (Item 2, Figure 4–8) until the fluid level is at but not above the upper marker hole in the dipstick.

9. Check hydraulic hoses.

⚠ WARNING

Hydraulic oil under pressure can penetrate body tissue causing serious injury and possible death. When troubleshooting a hydraulic system for leaks, always use cardboard or wood as a detector. DO NOT USE YOUR BARE HANDS. If you are injected with hydraulic oil or any other fluids, immediately seek treatment by a doctor trained in the treatment of penetrating fluid injuries.

a. Fully raise the loader arm, install and secure the safety support.
b. Follow all of the hoses, line and tubes from the control valve to their end (Items 2, 3, 4 and 5, Figure 4–9). Inspect the connections and look for signs of leaking hydraulic fluid, wear or damage.
c. Carefully inspect both sets of quick couples (Item 2, Figure 4–9) to make sure that they are not damaged or leaking. Make sure to check for signs of leakage or damage to the drive motors and to their hydraulic connections.
d. If any signs of damage are visible, do not operate the machine until repairs have been made.

NOTICE

Many of the fittings and lines on this machine are contained within the body of the machine. With the engine off, carefully inspect all of the lines and fittings leading to the hydraulic pumps, the hydraulic filter assembly (Item 5, Figure 4–9), the base of the boom lift cylinder (Item 6, Figure 4–9), etc.

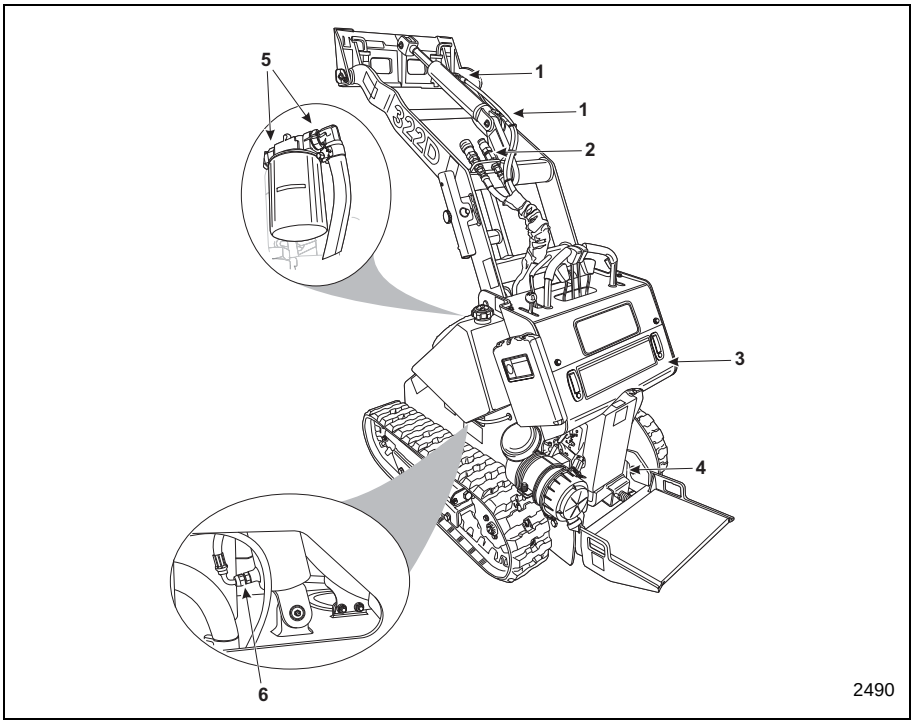


Figure 4–9 Inspect Hydraulic Lines and Fittings

10. Grease pivot shafts with proper type of grease. There are 10 lubrication points on this machine, see Figure 4–10.

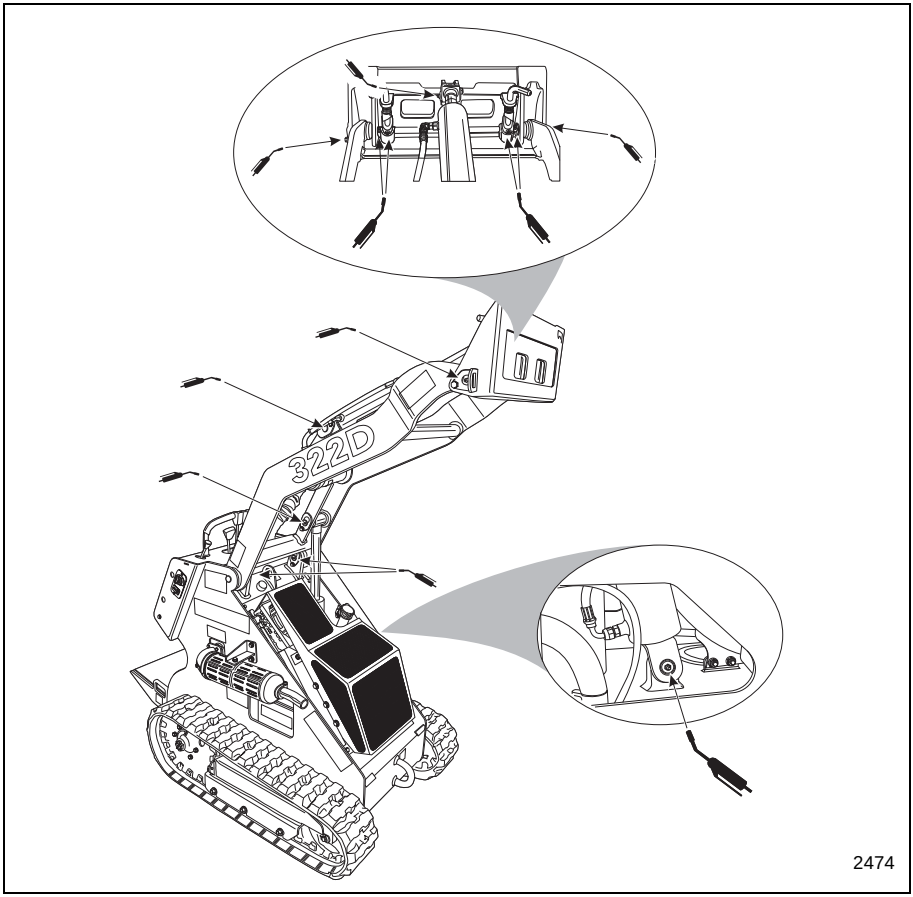


Figure 4–10 Lubrication

11. Check for proper track tension.
    a. Raise the machine off the ground and support it using a device capable of safely supporting 3,000 lbs. See Figure 4–11 or suggested location of the support devices.
    b. Tilt the bucket downwards until the cutting edge is touching the ground. See Figure 4–11.
    c. Lower the loader arm assembly, pushing the front of the machine upwards. Continue raising the machine until the rear drive sprocket is off the ground. Shut off the engine.
    d. Measure the gap between the bottom of the center bogey guide roller (Item 1, Figure 4–11) and the track. The proper tension will be about a 1/4" - 3/8" deflection.

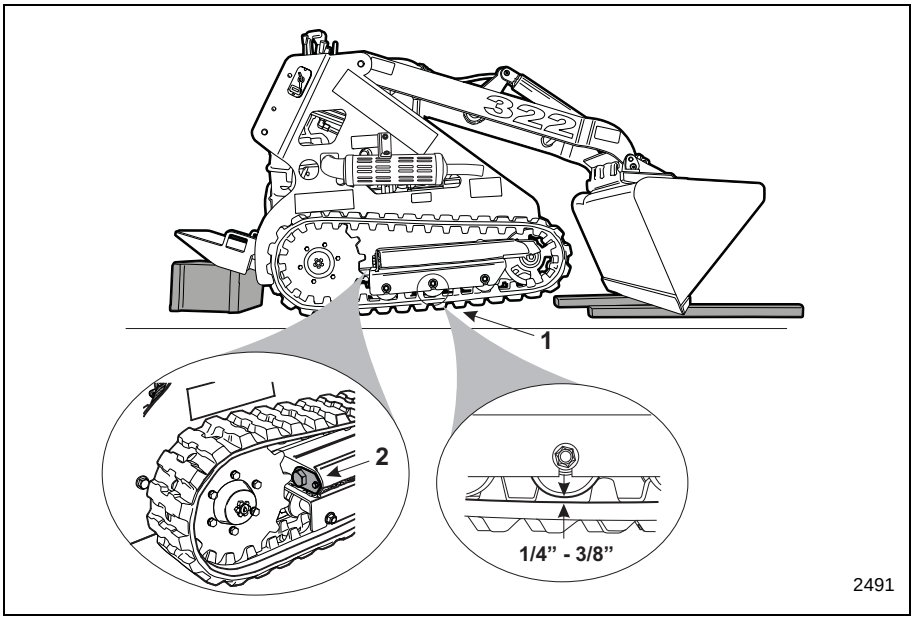


Figure 4–11 Track Deflection Measurement and Adjustment

e. Remove track tension lock plate bolt (Item 1, Figure 4–12) using a 9/16" wrench.

f. Remove the adjustment bolt lock plate (Item 2, Figure 4–12).

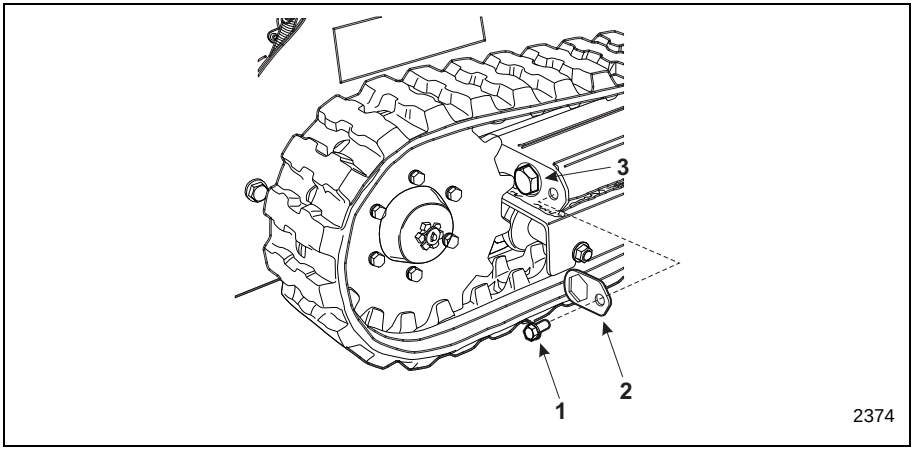


Figure 4–12 Track Adjustment Bolt Lock Plate

g. Adjust the track tension by rotating the tension bolt (Item 3, Figure 4–12) COUNTERCLOCKWISE to tighten the track and CLOCKWISE to loosen the track. Use the 1 5/8" wrench (Item 2, Figure 4–13) located under the removable service access cover.

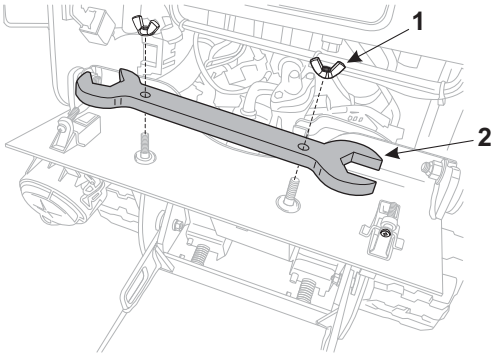


Figure 4–13 Track Adjustment Bolt Lock Plate

h. With the tracks still off the ground, start the engine and rotate just the track being adjusted three or four times in both forward and reverse. Shut off the engine after rotating the track.

i. Re-measure the deflection dimension.

j. Repeat the measurement and adjustment procedure on the other track assembly.

k. Lower the machine onto the ground.

New Machine Brake-in Maintenance Procedures

Do the following after the first 20 operating hours for a new machine only.

1. Change engine oil - see engine manual.
2. Change engine oil filter, which is located on the left side of the engine - see engine manual and (Item 1, Figure 4–14).

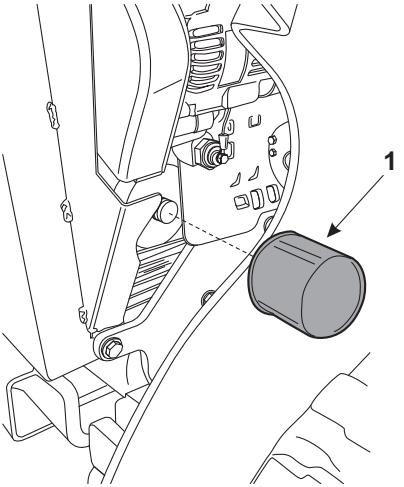


Figure 4–14 Engine Oil Filter

3. Change the hydraulic filter. See Service Manual and Figure 4–15.

⚠ CAUTION

- **The hydraulic filter will be filled with hydraulic fluid. Make sure to dispose of the used hydraulic filter in an appropriate manner and according to State and Local regulations.**
- **Make sure to dispose of the used hydraulic fluid in an appropriate manner and according to State and Local regulations.**
- **Place a container under the hydraulic filter assembly to capture any hydraulic fluid that may drain out.**

a. Remove the spin-on hydraulic filter (Item 1, Figure 4–15) from the filter mount that is located underneath the hydraulic cooler.

NOTICE

- To access the filter assembly, reach in through the access opening under the fuel tank.
- Make sure to allow the engine and hydraulic system to cool off before beginning this procedure.

b. Using a small amount of hydraulic oil, lubricate the rubber gasket on top of the new filter canister and install the filter onto the filter mount.

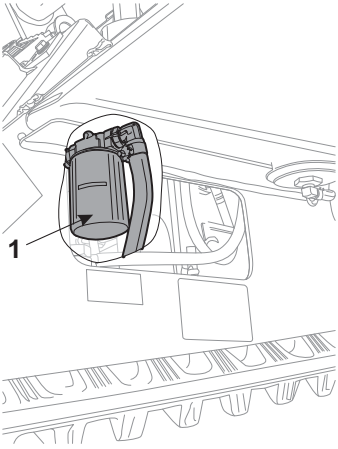


Figure 4–15 Hydraulic Oil Filter

c. Start and run the engine for about 30 seconds, and then shut the engine off. Using the hydraulic oil level dip stick (Item 1, Figure 4–16), check the hydraulic oil level. Add the appropriate hydraulic fluid as needed through the filler port (Item 2, Figure 4–16) on top of the hydraulic oil tank.

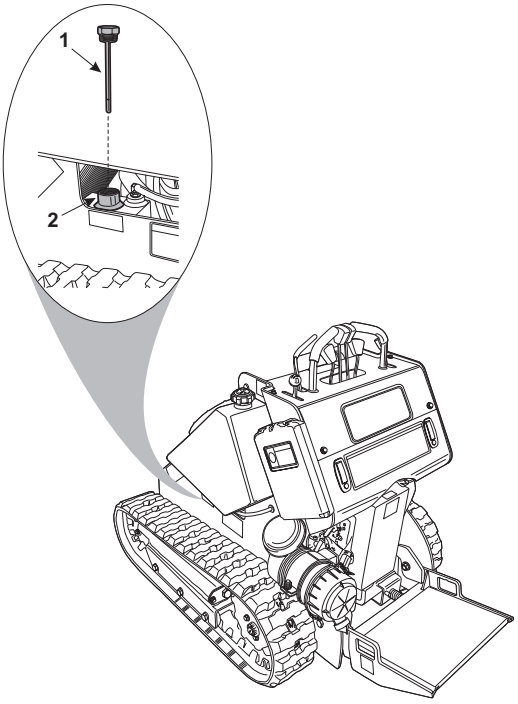


Figure 4–16 Hydraulic Oil Filter

Weekly Maintenance Procedures

Do the following procedures weekly or every 50 operating hours:

1. Do all Daily maintenance procedures
2. Check the battery (Item 4, Figure 4–17) and cable connections (Items 5 and 6, Figure 4–17) for signs of leaking, corrosion or damage.

NOTICE

Make sure that the battery clamp (Item 3, Figure 4–17) is securely holding the battery in position. If needed, tighten the lock nut (Item 1, Figure 4–17) to secure the battery.

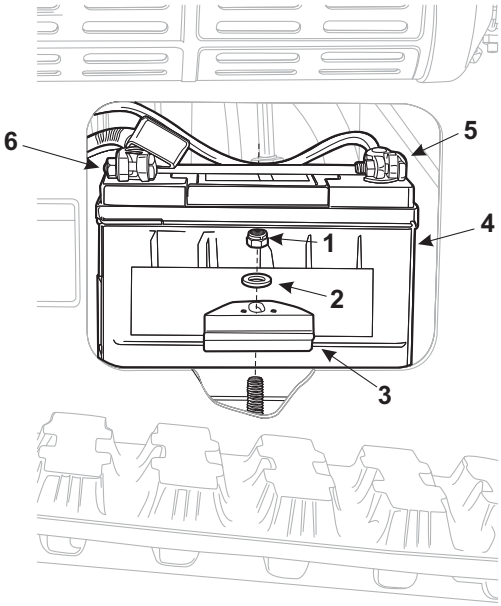


Figure 4–17 Battery and Cable Connections

3. Clean the engine radiator.

⚠ CAUTION

DO NOT check or clean the engine radiator until it is cool to the touch.

a. Remove the protective cover screen (Item 1, Figure 4–18).

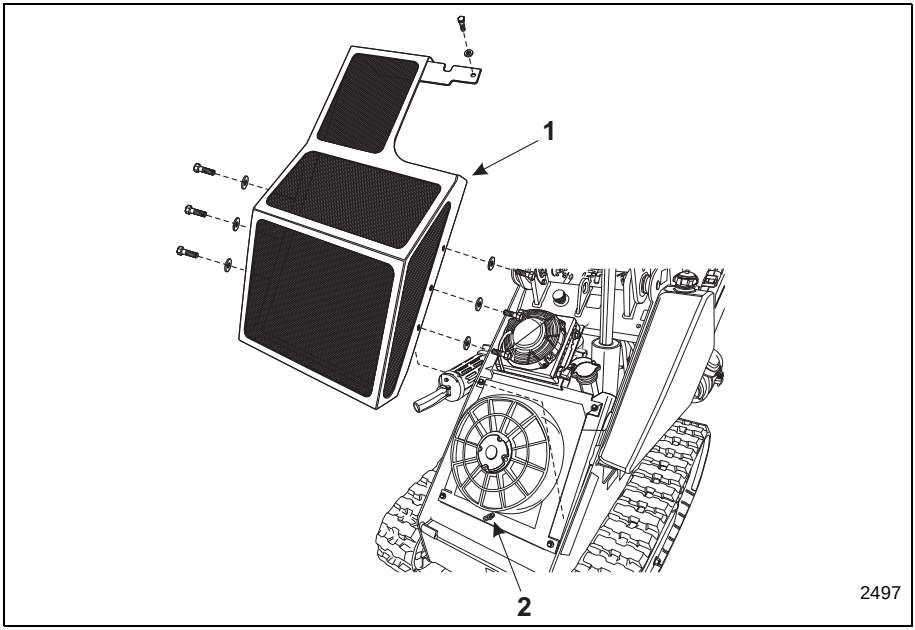


Figure 4–18 Remove Protective Screen

b. Using compressed air or a garden hose (Item 1, Figure 4–19), spray air (water) through the engine radiator from the outside to remove any built up dirt or debris on the inside surface of the engine radiator.

NOTICE

DO NOT use high pressure water (pressure washer, etc.) to clean the radiator. Severe damage to the radiator could be caused.

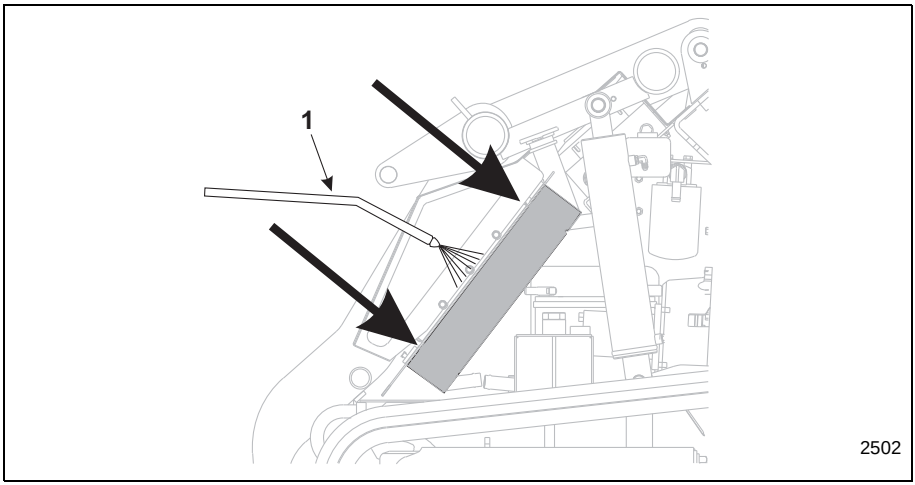


Figure 4–19 Clean Engine Radiator

c. Reinstall and secure the protective screen.

Monthly Maintenance Procedures

Do the following procedures monthly or every 200 operating hours:

1. Do all Daily and Weekly maintenance procedures
2. Replace engine oil and engine oil filter - see engine manual
3. Check air filter and replace outer paper element (Item 2, Figure 4–20).
4. Replace the outer paper element* (Item 2, Figure 4–20) and check inner element* (Item 3, Figure 4–20)
   a. Unhook the two retaining clips and remove the end cap (Item 1, Figure 4–20) from the air cleaner housing (Item 4, Figure 4–20).
   b. Pull the outer air cleaner element (Item 2, Figure 4–20) out of the housing.
   c. After the main element is removed, check the condition of the inner element (Item 3, Figure 4–22). It should be replaced whenever it appears dirty, typically every other time the main element is replaced. Clean the area around the base of the inner element before removing it, so dirt does not get into the engine.
   d. Do not wash the paper element and inner element or use pressurized air, this will damage the elements. Replace dirty, bent or damaged elements with new genuine Boxer repair parts as required.
   e. Handle new elements carefully; do not use if the sealing surfaces are bent or damaged.
   f. Check all parts for wear, cracks, or damage.
   g. Replace any damaged components.
   h. If needed, install the new inner element, followed by the outer element. Slide each fully into place in the air cleaner housing.
   i. Reinstall the end cap (Item 1, Figure 4–20) so the dust ejector valve is down and secure the end cap with the two retaining clips.

* In extremely dusty or dirty operating conditions, this service cycle may need to be shortened.

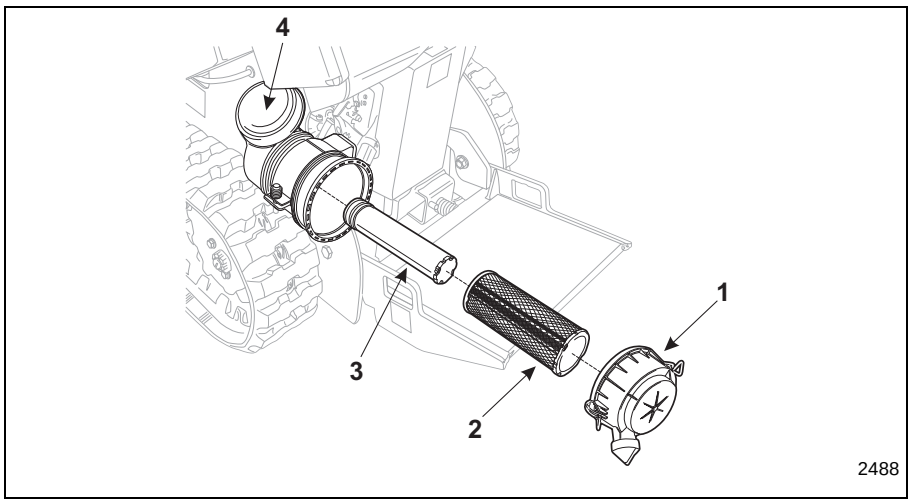


Figure 4–20 Air Filter Assembly

5. Replace fuel filter.

DANGER

- **DIESEL FUEL IS VERY FLAMMABLE. HANDLE WITH EXTREME CAUTION.**
- **MAKE SURE THAT THE ENGINE HAS BEEN ALLOWED TO COOL BEFORE PERFORMING THIS OPERATION.**
- **MAKE SURE THAT THERE ARE NO OPEN FLAMES IN THE WORK AREA.**
- **ONLY PERFORM THIS PROCEDURE IN AN AREA WITH PROPER VENTILATION.**
- **DO NOT SMOKE WHILE PERFORMING THIS OPERATION.**
- **CLEAN UP ANY SPILLED FUEL BEFORE STARTING THE ENGINE.**

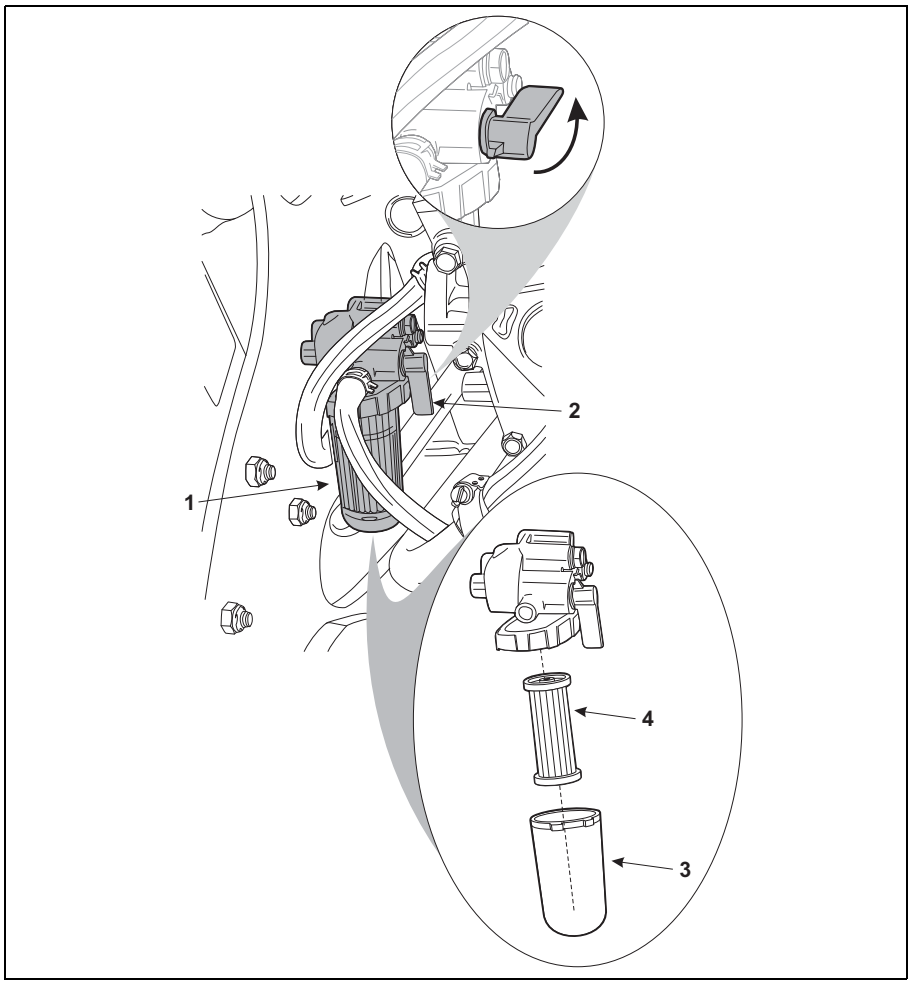


Figure 4–21 Engine Fuel Filter/Water Separator

⚠ CAUTION

- **Allow engine to cool before removing the filter bowl.**
- **Place a container underneath the filter assembly to catch any spilled fuel.**
- **Properly dispose of fuel according to State and Local regulations.**
- **Make sure to clean up any spilled fuel from in and around the engine compartment of the machine. Spill fuel may be ignited by a hot engine.**

a. Rotate the fuel shut off valve (Item 2, Figure 4–21) to stop the fuel flow from the tank.
b. Place a suitable sized container beneath the filter assembly to catch any spilled fuel.
c. Rotate the filter bowl (Item 3, Figure 4–21) and remove it from the filter assembly.
d. Dispose of the fuel and water in the bowl according to State and Local regulations.
e. Remove the paper filter (Item 4, Figure 4–21) and dispose of according to State and Local regulations.
f. Install new paper filter.
g. Reinstall and secure the filter bowl.
h. Reopen the fuel valve.

NOTICE

If the fuel bowl does not fill with fuel, it may be necessary to air bleed the fuel system. See Fuel System Air Bleed instructions.

6. Check battery for signs of leakage or for corrosion on the battery cables.
   a. Check the battery (Item 4, Figure 4–22) for signs of leaking electrolyte. If any signs of damage are visible, remove and replace the battery.

b. To prevent corrosion, spray on a battery protectent and sealer onto both terminals and cable clamps (Items 5, 6, Figure 4–22) after cables are installed.

c. The electrical system on this machine is a NEGATIVE ground system.

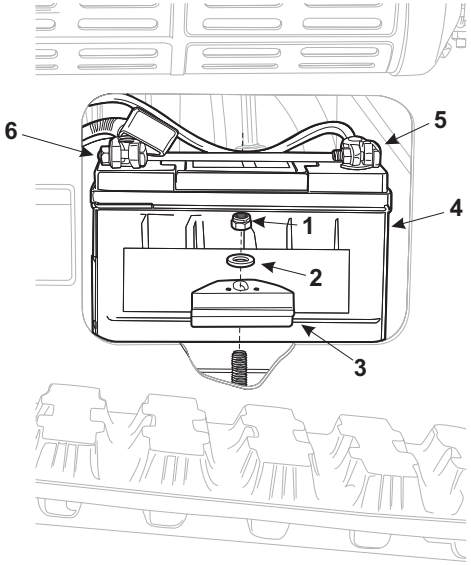


Figure 4–22 Battery and Tie Downs

Fuel System Air Bleeding Procedures

1. Loosen the air bleed bolt (Item 1, Figure 4–23). DO NOT remove this bolt.
2. Crank the engine until only diesel fuel without any air bubbles comes out of the air bleed.
3. Fully tighten the air bleed bolt.
4. Dispose of the spilled diesel fuel according to State and Local guidelines.

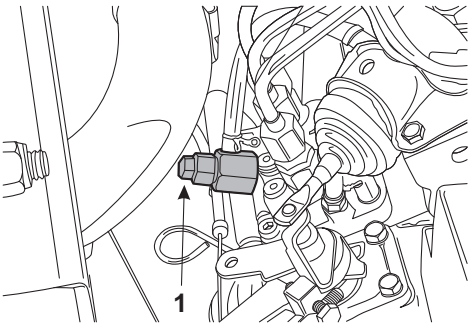


Figure 4–23 Fuel System Air Bleed Valve

Annual Maintenance Procedures

Do the following procedures annually:

1. Do all Daily, Weekly and Monthly maintenance procedures
2. Replace air filter** See page 4-18, Step 3.
3. Check engine idle speed (Refer to engine manual)
4. Replace hydraulic fluid**.
   a. Place a suitable sized container at the right rear corner of the Boxer.
   b. Remove the hydraulic tank drain plug (Item 1, Figure 4–24) and drain all hydraulic fluid from the machine.

      NOTICE: Make sure to inspect the O-ring (Item 2, Figure 4–24) on the drain plug. Replace the O-ring if any signs of damage are noted.

**Extremely dusty or dirty working conditions may require more frequent service/replacement.

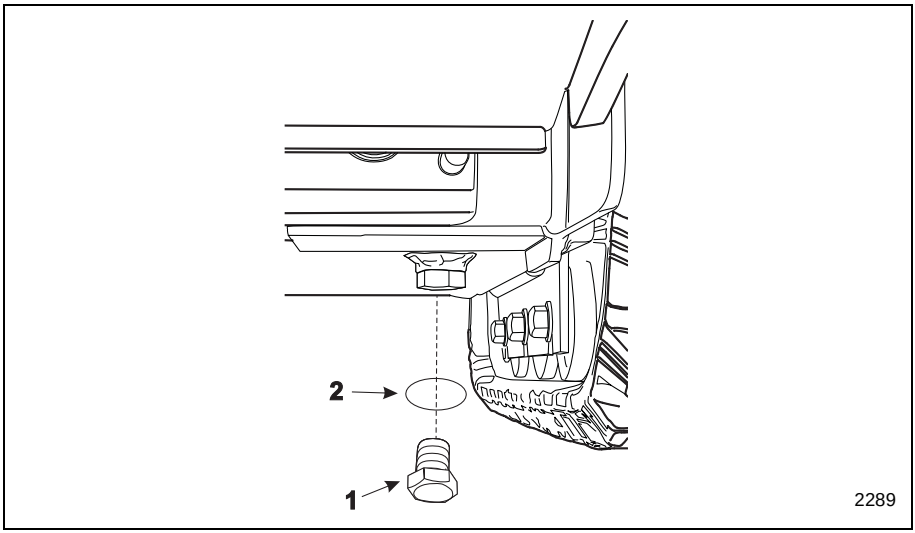


Figure 4–24 Hydraulic Tank Drain Plug

   c. When all of the hydraulic fluid has drained out of the tank, reinstall and secure the drain plug.

NOTICE

- **Make sure to dispose of the used hydraulic fluid in an appropriate manner and according to State and Local regulations.**
- **The hydraulic filter will be filled with hydraulic fluid. Make sure to dispose of the used hydraulic filter in an appropriate manner and according to State and Local regulations.**

   d. Replace hydraulic filter. See page 4-13, Step 3.

      NOTICE: The hydraulic dipstick is located underneath the hydraulic filler plug, located along the outside of the machine. See Figure 4–25.

e. Unscrew the dipstick assembly and remove from the machine. (1, Figure 4–25) and fill the hydraulic tank with the proper hydraulic fluid (Chevron Rykon Premium ISO 46 or equivalent) until the fluid level is at but not above the upper marker hole in the dipstick.

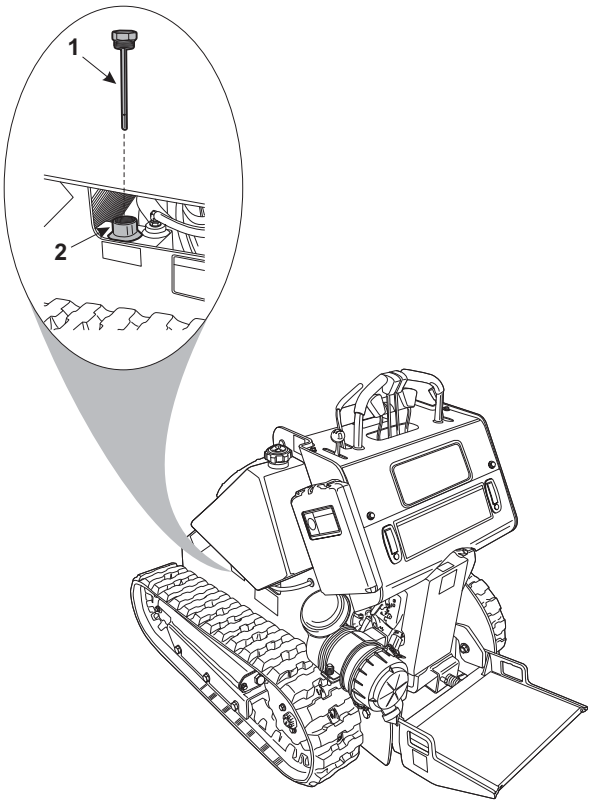


Figure 4–25 Hydraulic Fluid Level Dip Stick

NOTICE

Do not over fill the hydraulic system. Damage to the hydraulic system might result.

f. Start the machine and run the engine at low idle for several minutes. Shut off the engine.

g. Recheck the hydraulic fluid level as described above.

5. Change Radiator Fluid

⚠ CAUTION

The coolant is hot and under pressure. DO NOT begin this procedure until the engine radiator is cool to the touch.

a. Remove the protective screen (Item 1, Figure 4–26) from over the engine radiator and hydraulic radiator.

b. Position a container of suitable size under the front of the machine.

c. Remove the radiator cap.

d. Open the petcock (Item 2, Figure 4–26) at the bottom of the radiator and allow all of the coolant to drain from the radiator.

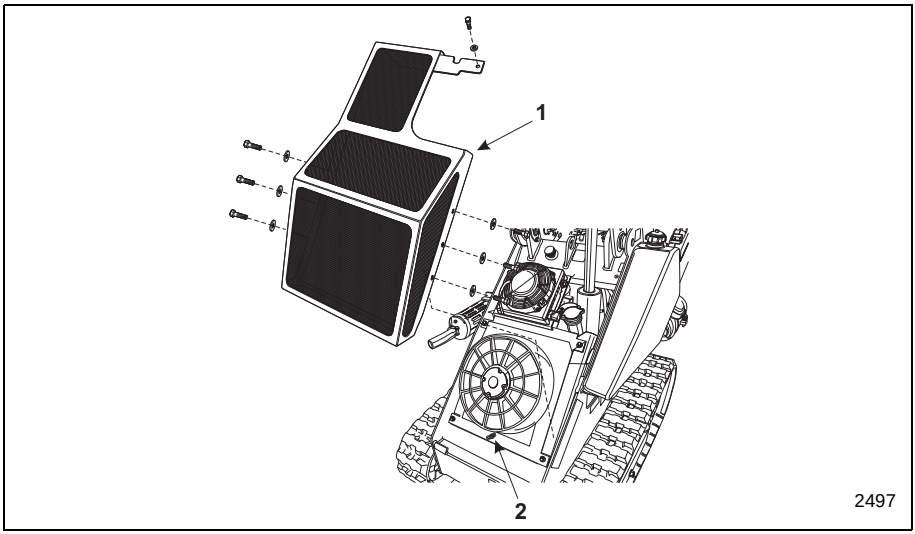


Figure 4–26 Radiator Drain

e. Close the petcock and refill the radiator with a 50-50 mix of radiator coolant and water, according to the specifications in the Engine Manual. Make sure to fill the radiator only to the line indicated on the decal located on the filler neck (Item 2, Figure 4–27).

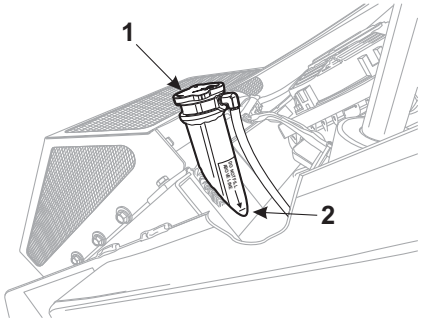


Figure 4–27 Radiator Fill Level

f. Reinstall the radiator cap.

g. Reinstall the protective screen over the radiator.

General Maintenance

Draining Fuel Tank

DANGER

1. **DIESEL FULE IS EXTREMELY FLAMMABLE AND HIGHLY EXPLOSIVE.**
2. **A FIRE OR EXPLOSION FROM GASOLINE CAN BURN YOU OR OTHERS AND CAUSE PROPERTY DAMAGE.**
3. **DRAIN FUEL FROM TANKS WHEN THE ENGINE IS COLD.**
4. **FUEL TANKS SHOULD ONLY BE DRAINED IN AN AREA THAT IS WELL VENTILATED.**
5. **WIPE UP ANY GASOLINE THAT SPILLS.**

1. Park the machine on a level surface, to ensure that the fuel tank is completely drained.
2. Lower the loader arms and stop the engine and remove the key.
3. Allow the engine to cool completely.
4. Shut off the fuel valve on the fuel filter/water separator assembly (Item 1, Figure 4–28).
5. Install a clamp on the rubber incoming fuel line.
6. Loosen spring clamp (Item 3, Figure 4–28) on the incoming fuel line (Item 4, Figure 4–28) and slide the clamp along the fuel line away from the filter assembly.
7. Place a suitable sized container at the rear of the machine.

NOTICE

The fuel tank holds 4 gallons of diesel fuel.

8. Remove the fuel line from the filter assembly and immediately place it in the drain container and remove the clamp on the fuel line. Fully drain the fuel tank into the container.
9. Remove and replace the fuel filter.
10. Reinstall the fuel line (Item 4, Figure 4–28) and secure with the spring clamp (Item 3, Figure 4–28).
11. Refill the fuel tank with fresh fuel.
12. Open the fuel valve on the fuel filter/water separator assembly.
13. If the fuel filter does not fill completely with fuel, bleed air from the system. See “Fuel System Air Bleeding Procedures” on page 21 .

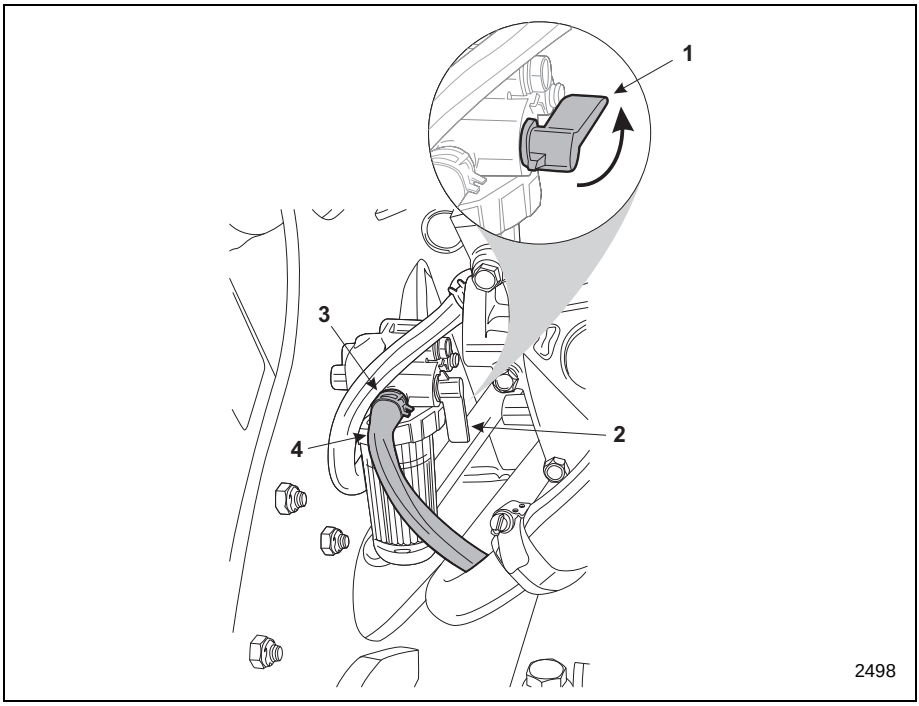


Figure 4–28 Fuel Line to Fuel Filter/Water Separator

⚠ CAUTION

- **Make sure to clean up any spilled fuel from in and around the engine compartment of the machine.**
- **Spilled fuel may be ignited by a hot engine.**

Hydraulic Interconnect Diagram

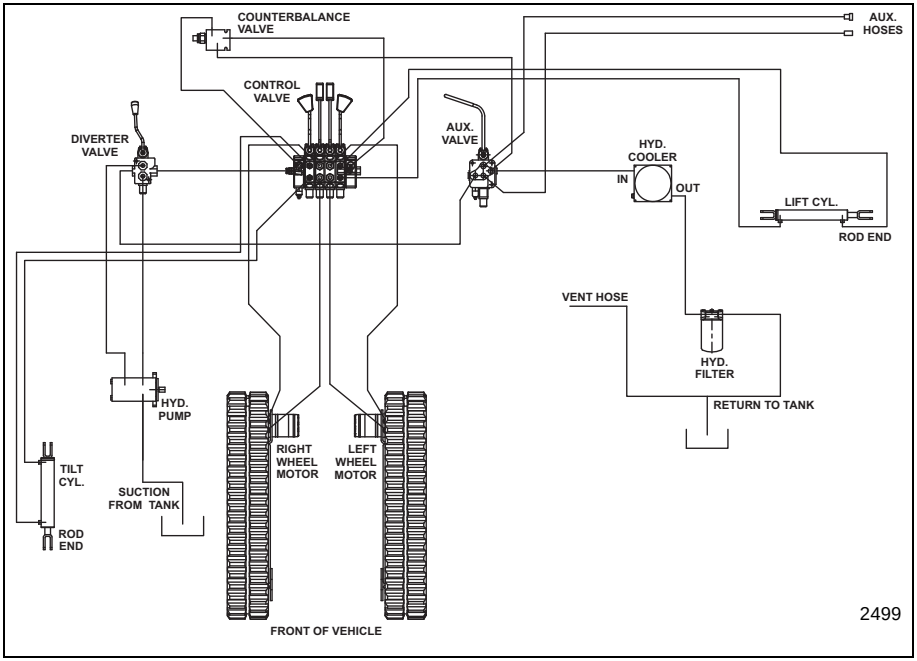


Figure 4–29 Boxer 322D Hydraulic Interconnect Diagram

Hydraulic Schematic

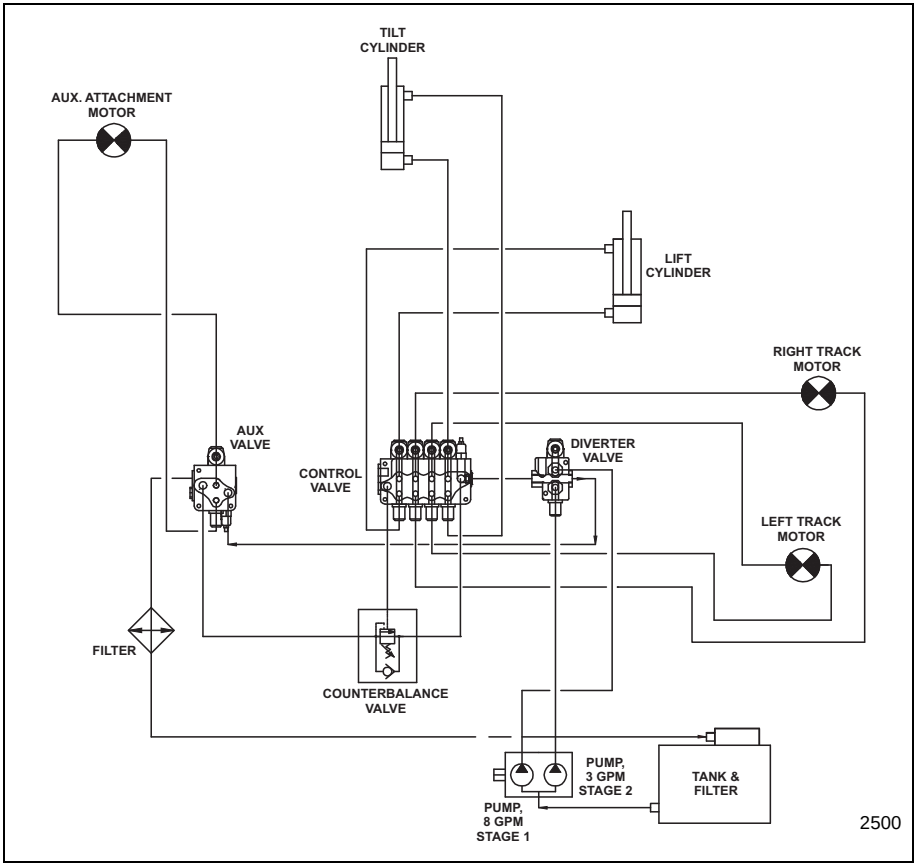


Figure 4–30 Boxer 322D Hydraulic Schematic

Section 5 – Troubleshooting

The following procedures will assist you in determining the potential cause of a machine operating problem. Make sure to follow all safety precautions stated in this manual when doing any work on the machine.

⚠ CAUTION

Make sure to follow all safety precautions stated in this manual when doing any work on the machine.

Problem	Possible Causes	Corrective Action
Starter does not turn the engine over.	• Auxiliary hydraulics/ Operator presence lever is either in Forward or Reverse position with no hydraulically powered attachment installed.	• Move lever to neutral position.
	• Battery is dead.	• Charge the battery. • If battery does not hold a charge, replace the battery.
	• Electrical connections are corroded or loose.	• Check electrical connections for good contact. • Remove cables from battery terminals and fully clean battery terminals and cable clamps. • If the cable clamps cannot be properly cleaned, replace connectors.
	• Relay or starter switch is defective.	• Contact Authorized Service Dealer.
	• Engine is in hydraulic lock due to a cylinder filled with fuel, water or engine oil.	• Allow engine to cool before attempting this procedure. • Remove glo-plugs and turn engine over to pump excess fuel from engine cylinder. • Make sure to clean up any spilled fuel before attempting to start the engine.

Problem	Possible Causes	Corrective Action
Engine will not start, starts hard, or fails to keep running.	• Auxiliary hydraulics/ Operator presence lever is either in Forward or Reverse position with no hydraulically powered attachment installed.	• Move lever to neutral position.
	• Fuel tank is empty.	• Fill fuel tank with fuel.
	• Air cleaner is dirty.	• Clean air filter housing and replace the filter elements. • Bleed air from fuel system
	• Fuel injector dirty or fouled.	• Contact Authorized Service Dealer.
	• Dirty or contaminated fuel filter.	• Replace fuel filter.
	• Dirt, water, or stale fuel is in fuel system.	• Drain fuel in tank into an appropriate storage container and dispose of bad fuel properly. • Refill fuel tank with fresh, clean fuel. • Empty fuel/water separator bowl. • Replace fuel filter.
	• 15 Amp fuse blown.	• Replace fuse.
Engine looses power.	• Engine load is excessive	• Reduce ground speed. • Reduce speed of attachment.
	• Air cleaner is dirty.	• Clean air filter housing and replace the filter elements.
	• Engine oil level in crankcase is low.	• Add the appropriate engine oil to crankcase. See engine manual for oil specifications.
	• Dirty or contaminated fuel filter.	• Replace fuel filter.
	• Dirt, water, or stale fuel is in fuel system.	• Drain fuel in tank into an appropriate storage container and dispose of bad fuel properly. • Refill fuel tank with fresh, clean fuel. • Empty fuel/water separator bowl. • Replace fuel filter.

Problem	Possible Causes	Corrective Action
Engine overheats.	• Engine load is excessive.	• Reduce ground speed. • Reduce speed of attachment. • Engine oil level in crankcase is low. • Add the appropriate engine oil to crankcase. See engine manual for oil specifications.
	• Engine radiator not cooling engine properly.	• Clean protective cover to allow proper air flow. • Clean engine side of radiator. • Start engine to make sure radiator fan is running. If not, check fuse. Fuse OK – contact Service Dealer. • Check radiator coolant level. **⚠ WARNING** **The engine coolant in the radiator will be under pressure and will be very hot. Let the engine and radiator to cool to the touch before attempting to open radiator cap.** • Contact Service Dealer
Abnormal engine vibration.	• Engine mounting bolts are loose.	• Tighten engine mounting bolts.
With the engine turned off, the boom creeps downward more then 3” per hour (less than 3" per hour is normal for this machine).	• Valve spool leakage.	• Contact Service Dealer.
	• Cylinder seals are leaking.	• Replace cylinder seals.
With the engine turned off, boom drops downward quickly and then stops.	• Cylinder seals are leaking.	• Replace cylinder seals.
The machine does not travel in either forward or reverse directions.	• Engine is not running at full speed.	• Advance throttle to full engine speed.
	• Hydraulic fluid is cold.	• Fully warm hydraulic fluid.
	• Hydraulic fluid level is low.	• Check and fill the hydraulic fluid tank with the appropriate hydraulic fluid.
	• Fuel tank is empty and engine stops.	• Fill fuel tank with fuel.
	• If all above has been checked.	• Contact authorized service dealer.

Problem	Possible Causes	Corrective Action
Engine does not start with hydraulically powered attachment installed.	• Auxiliary control lever in activation position.	• Move control lever to Neutral position.
Rubber track slips on drive sprocket or comes off machine	• Track drive tension is not correct.	• Adjust Track Tension. See Section 4 – Track Drive Tension Adjustment.
	• Track drive sprocket holes worn or damaged.	• Replace rubber track.
	• Track guide fingers worn, damaged or missing.	• Replace rubber track.
Starter does not turn the engine over.	• Auxiliary hydraulics/ Operator presence lever is either in Forward or Reverse position with no hydraulically powered attachment installed.	• Move lever to neutral position.
	• Battery is dead.	• Charge the battery. • If battery does not hold a charge, replace the battery.
	• Electrical connections are corroded or loose.	• Check electrical connections for good contact. • Remove cables from battery terminals and fully clean battery terminals and cable clamps. • If the cable clamps cannot be properly cleaned, replace connectors.

Section 6 – General Specifications

Engine System				
Type	Kubota, Command Pro			
Cooling System	Liquid Cooled			
HP / KW	22 / 14.9			
Fuel Tank	4.5 Gallons			
Air Cleaner	Heavy duty, 2 stage, remote mounted			
Hydraulic System				
Pressure (Auxiliary/Boom & Tilt Cylinder Circuit)	3000 psi system relief			
Pressure Ground Drive Circuit	3000 psi system relief			
Flow Auxiliary	9.4 GPM (High) 3 GPM (Low) @ 3600 rpm			
Flow Ground Drive	9.4 GPM (High) 3 GPM (Low) @ 3600 rpm			
Reservoir Capacity	16 gallons			
Filter	10 Micron			
Electrical System				
Battery	12 Volt			
Control System				
Starting	Keyed ignition switch.			
Throttle/Choke	Remote Mount Throttle			
Steering	Two spring centered control lever with zero turning type controls.			
Boom/Loader Arms	Three position, spring centered lever control. Up, neutral, down.			
Bucket/Attachment Tilt	Three position, spring centered lever control. Extend, neutral, and curl.			
Auxiliary/Attachment Control	Two position, detented, Third position spring return to neutral.			
Track Options	7" Wide Track			
Drive Train	Two Wheel Motors			
Operator Platform	Suspended Stand On Platform			
Mount Plate	Universal CUL Attachment Plate			
Warranty				
Engine Warranty	Two Year			
Product Warranty	One Year			
Ground Drive System-Dimensions				
Units	**English**		**Metric**	
Wheelbase	32	in.	813	mm
Ground Clearance	5.0	in.	127	mm
Overall Length (w/ Bucket 3101400)	87	in.	2210	mm
Overall Length (without Bucket)	68	in.	1727	mm
Overall Width	34.5	in.	876	mm
Overall Height	49	in.	1235	mm
Overall Operating Height (Fully Raised)	92	in.	2337	mm
Hinge Pin Height (Fully Raised)	70	in.	1765	mm
Dump Height	54	in.	1372	mm
Ground Speed (Max)	3.4	mph	5.5	kph
Units	**English**		**Metric**	

Dump Angle	34	deg.	34	deg.
Reach	28	in.	711	mm
Tip Capacity	1325	lb.	601	kg
Operating Capacity, 35% of tip load.	464	lb.	210	kg
Operating Capacity, 50% of tip load.	663	lb.	301	kg
Weight (without Bucket)(*w/Bucket)	1900	lb.	862	kg
Ground Pressure	3.3	psi	22.6	kPa

Vibration Data

Engine rpm was set @ 3,000 rpm. The hand-arm and whole body vibration measurements were made with the operator present.

Vibration Test @ hand /arm: Declared value is 5.1 m/s^2.

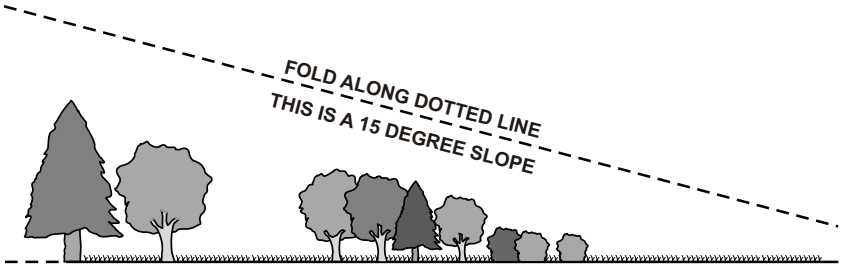
Vibration Test @ whole body: Declared value is 0.4 m/s^2.

Noise Data

Tests were performed in accordance with EU Directive 2000/14/EC, in addition to ISO 3744 and ISO 6395. Engine rpm was set @ 3,000 rpm. The noise measurements were made with the operator present.

The declared value for the operator is 89 dB L_{PA}.

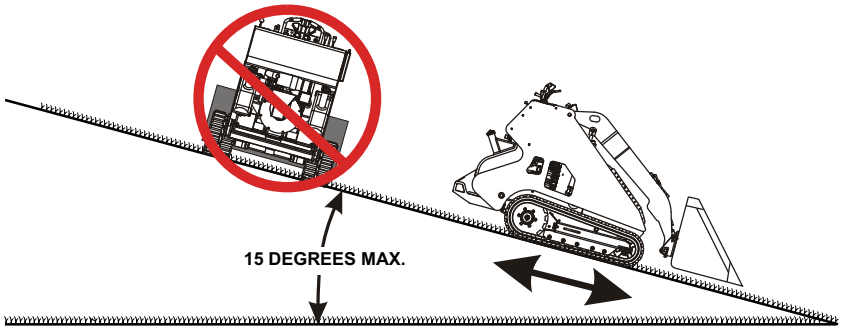
The Guaranteed SWL value is 101 dB L_{WA}.



DO NOT TRAVEL ACROSS OR UP AND DOWN
A SLOPE GREATER THAN 15 DEGREES.

SUGGESTED GUIDE FOR SIGHTING SLOPES FOR SAFE OPERATION OF A COMPACT UTILITY LOADER WITH AN ATTACHMENT.

DO NOT REMOVE THIS PAGE FROM THE MANUAL.



⚠ WARNING

- To avoid serious injury, operate your unit up and down the face of slopes.
- Travel across slopes with great caution.
- Do not operate on slopes greater than 15 degrees.
- Make turns gradually to prevent tipping or loss of control.
- Exercise extreme caution when changing direction on slopes.
- Control of the machine may be affected by installed attachments.
- Reduce travel speed on slopes.
- Read and understand all Warnings and Operating Instructions in the Operator's Manual.

1. Fold this page along dotted line indicated above. DO NOT remove the page from the manual.
2. Hold page before you so that its left edge is vertically parallel to a tree trunk or other upright structure.
3. Sight across the fold in the direction of the hill slope you want to measure.
4. Compare the angle of the fold with the slope of the hill.

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Part Number 999-825