SVU-50

Super Vacuum Manufacturing
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DANGER

PERSONAL RESPONSIBILITY CODE

The member companies of FEMSA that provide emergency response equipment and services want responders to know and understand the following:

1. Firefighting and Emergency Response are inherently dangerous activities requiring proper training in their hazards and the use of extreme caution at all times.
2. It is your responsibility to read and understand any user's instructions, including purpose and limitations, provided with any piece of equipment you may be called upon to use.
3. It is your responsibility to know that you have been properly trained in Firefighting and/or Emergency Response and in the use, precautions, and care of any equipment you may be called upon to use.
4. It is your responsibility to be in proper physical condition and to maintain the personal skill level required to operate any equipment you may be called upon to use.
5. It is your responsibility to know that your equipment is in operable condition and has been maintained in accordance with the manufacturer's instructions.
6. Failure to follow these guidelines may result in death, burns or other severe injury.

FEMSA

Fire and Emergency Manufacturers and Services Association, Inc.
P.O. Box 147, Lynnfield , MA 01940 www.FEMSA.org

Supervac SVU-50 Operator Guide

JUNE 2012

For assistance please contact:

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Pre-Startup Check List - Fluids

⚠WARNING The SVU-50 is shipped empty of all fluids.

Prior to startup the correct amount of fluids must be added. Use the following check list to identify that proper levels of fluids have been established.

	Location	Fluid Type	Quantity Required
☐	Engine crankcase	API SL 10w40	3.75 Quarts
☐	Engine oil filter	API SL 10w40	0.25 Quarts
☐	Coolant fill tank	50/50 ethylene glycol – H^2O	2.5 Gallons
☐	Hydraulic reservoir	Universal Transdraulic Fluid	3.4 Quarts
☐	Fuel tank	minimum 85 octane petrol	18 Gallons

1. Fluid Requirements and Priming Procedures

Engine Oil

All directions indicated are interpreted as the viewer standing behind facing the rear of the SVU-50 looking through the shroud in the same direction as air flow.

The oil level dipstick and fill neck are located on the top right side of the engine compartment. Dipstick and filler neck covers are yellow color coded.

Crankcase oil capacity 3.75 Quarts.

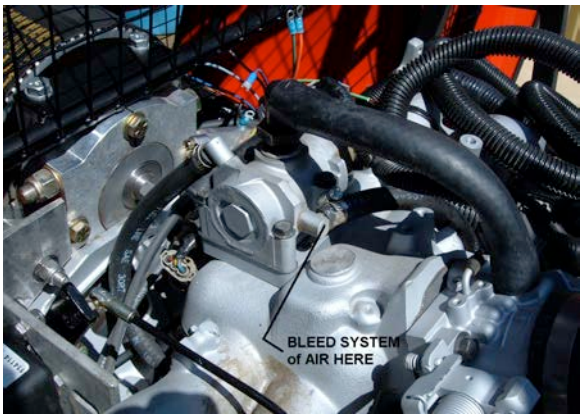
Oil filter is located on the lower left rear side of engine compartment.

Oil filter capacity 0.25 Quarts.

1. Unscrew oil filter and clean mounting base. Apply film of clean oil to filter gasket. Do not use grease.
2. Screw filter on until gasket reaches base. Then tighten according to instructions on filter using tightening guide markers.
3. Add oil, idle engine for five minutes and check for leaks. Turn engine off. Then add oil to "full" on dipstick.

Total oil capacity 4.0 Quarts.

Cooling System



Be certain that all air is purged from engine. It is necessary to bleed the system while filling with coolant.

Refer to photo to identify the coolant overflow hose on the engine. Loosen clamp and use a twisting motion to disconnect the hose from the engine.

Pour the 50 / 50 anti-freeze water mix in to the coolant fill tank slowly. Continue adding coolant mix until a steady stream of coolant exits the hose connection fitting.

Replace coolant overflow hose. Clamp securely. Continue to add coolant to the coolant fill tank. Fill coolant tank to within 10mm of the top of filler neck.

Add sufficient coolant to the overflow tank to bring the level up to the "LOW" mark.

24 VDC Electrical Connection

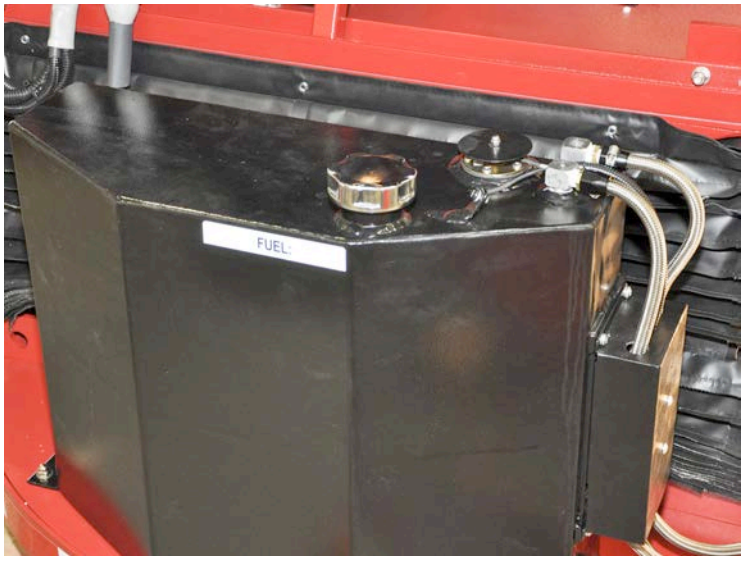
Power for the hydraulic lift table is to be provided from the vehicle. Lift table operates on 24VDC current.

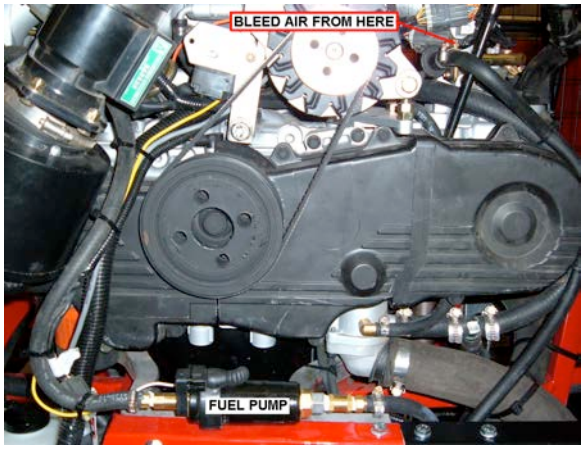
Wires are labeled to assist in identifying wiring requirements.

Fuel System

All air must be purged from fuel lines prior to engine startup.

1. Fill fuel tank with fuel.
2. Turn MASTER POWER switch on.
3. Turn IGNITION / STARTER switch on. Do not engage starter motor.
4. Verify fuel pump is functioning by feeling for vibration of fuel pump body.
5. Loosen (2) fuel line fitting screws until a steady stream of fuel is present. Do not attempt to bleed air by removing rubber fuel line.
6. Turn IGNITION / STARTER switch off
7. Tighten (2) fuel line fitting screws.
8. Turn IGNITION / STARTER switch on, check for leaks.
9. Engine performance will be erratic until all air is purged from system. Engine will not sustain full rpm operation if air is present in fuel lines.





2. Breakage or Damage During Shipment

The transportation company is fully responsible for all shipping damage and will resolve problems promptly if you handle it correctly. Please read these instructions carefully.

Examine the contents of all shipping cases. If you find any damage, call your transportation agent at once and have them make a description on the freight or express bill describing the damage and the number of pieces. Then contact us and we will send you the original bill of lading. Get a claim blank from the express or truck company. Fill the claim form out. Attach the claim blank to the original bill of lading together with a copy of our invoice. Attach a memo on which you show the value of the damaged goods. Present these papers to your local transportation agent. They will process your claim with reasonable promptness.

Please note, we cannot and will not enter claims for damages. If we filed claim here, it would be sent to your local freight agent for verification and investigation. This time can be saved by your filing the claim directly.

Since our goods are packed to comply with the regulations of all railroad, truck, and express companies, we cannot allow deduction from any invoice because of any damage, however, be sure to file your claim promptly. Our goods are sold F.O.B. factory. We take receipt from the transportation company certifying that the goods were delivered to them in good order, and our responsibility ceases.

It is seldom that any breakage or damage occurs in any of our shipments, and in no case will the customer be out any expense if they follow the above instructions.

Be sure to keep all damaged goods subject to examination of the truck or express company inspector, who may call on you some time later. These damaged goods, of course, will belong to them, and they will inform you what to do with them. If you dispose of these damaged goods, your claim may not be paid.

3. General Description and Specifications

Super Vac ventilators are specifically designed to provide a convenient and portable source of air. *Super Vac* positive pressure ventilators are tested for use in extreme conditions.

This ventilator is designed for high powered air movement. *Super Vac*'s propeller produces a greater intake of air and eliminates turbulence at the tips. Each blade is statically balanced for high efficiency and long life.

This document is designed to function as a quick start guide and not an in-depth comprehensive instructional manual. Please read all accompanying documents shipped with your ventilator. Due to the many features of gasoline powered equipment thorough familiarity with the engine operating controls is essential to assure safe and trouble free operation.

4. Product Safety Precautions ⚠WARNING

- Do not use the ventilator for purposes other than its' intended use.
- Wear eye and ear protection when operating the ventilator.
- Never operate ventilator while fatigued.
- Do not disassemble or modify the ventilator in any way. Doing so may lead to mechanical failure or personal injury.
- Never permit anyone to operate ventilator without proper instruction.
- Do not wear loose clothing that could become entangled in the operating ventilator.
- Do not operate ventilator without proper inlet or outlet guards in place. If guards are missing or damaged, contact factory for replacements.
- Do not place fingers or other foreign objects through inlet or outlet guards. Should a foreign object enter the ventilator, immediately stop engine. Be certain all mechanical motion has stopped. Disconnect spark plug wires from spark plugs and keep them away from spark plugs before removing foreign object.
- Do not use with any fuel supply source other than the provided fuel tank.
- Engine exhaust gas contains poisonous carbon monoxide. Avoid inhalation of exhaust gas. Never run the engine in a closed or confined area.
- Do not place or operate ventilator on unsteady tables, slanted surfaces or other unstable surfaces.
- Never use this ventilator in any explosive environment.
- Do not tamper with hydraulic control valves. Valves have been factory adjusted for optimum performance and safety.

5. General Specifications

SVU-50 Engine

Manufacturer	Subaru
Model	EJ25, fuel injected
Displacement	2500 cc
Rated Horsepower	165 HP
Cooling	Liquid cooled, 50 – 50 mix, ethylene glycol – H^2O, with corrosion additives approved for aluminum
Average Fuel Consumption (calculated)	3.3 Gallons/hour
Fuel Tank Capacity	18 Gallons (Avg. run time 6 hours)
Fuel Requirements	Premium automotive fuel 91-93 octane
Maximum Operating Engine RPM	4000 rpm
Maximum Oil Temperature	115° Celsius (240° Fahrenheit)
Minimum Operating Water Temperature	71° Celsius (160° Fahrenheit)
Maximum Operating Water Temperature	110° Celsius (230° Fahrenheit)
Oil Pressure Minimum	0,7 Kg / cm^2 (10 psi)
Oil Pressure Maximum	7 Kg / cm^2 (100 psi)
Fuel Pressure Minimum	2 Kg / cm^2 (28 psi)
Engine Oil Grade	Ambient temperature +2° C (+35 F) → +57° C (+135 F) API SL 10w40 Ambient temperature -35° C (-32 F) → +2° C (+35 F) API SL 5w30
Engine Oil Capacity	4 quarts
Cooling System Capacity	2.5 gallons

Service Parts

Oil filter	Fram PH3593A or equivalent
Fuel filter	Fram GG-4 or equivalent
Propeller drive belt	Goodyear 880 8M 85 (Pitch Length 880mm, pitch 8m, width 85mm) or equivalent
Engine accessory drive belt	Dayco 5040285 or equivalent
Spark plug	NGK FR5AP-11 or equivalent

6. SVU-50 Views

Left View

Right View

Front View

Rear View

8. Pre-run Inspection Procedures ⚠WARNING

Correct any problems discovered before operation.

Pre-startup inspection requirements

Perform a thorough inspection of the fuel powered components:

- Front and rear guards for damage, looseness.
- Shroud outer surface for nicks, cracks.
- Shroud inner surface for nicks, cracks, cleanliness. Verify all mounting hardware is of proper tightness.
- Propeller blades, front, back, leading and trailing edges for chips or cracks. Verify that blades are clean, with no unusual wear or damage.
- Verify propeller tips-to-shroud clearance.
- Propeller drive belt for cracks, splits, fraying, de-lamination or tooth damage. Replace belt if any teeth are missing or damaged. Proper tension. With a 2Kg load belt should deflect 6 – 14 mm when engine is cold. Belt tension will change during operation.
- Exhaust system, all fasteners secure and in good condition. Check system for cracks.
- Check engine oil level. Visually inspect dipstick for oil quality, burnt odor, metal particles, excessive moisture.
- Inspect engine for signs of oil or coolant leakage.
- Inspect coolant radiator for debris or damage.
- Engine coolant reservoir at proper level. Coolant hoses in good condition, no cracks, splits or leakage.
- Check that all electrical wires and connections are secure. Inspect all wires for insulation damage.
- Verify spark plug wires are secure.
- Check air filter element for damage, excessive dirt accumulation.
- Inspect fuel supply lines for cracks, splits or deterioration.
- Verify that a full supply of fuel is in fuel tank. Do not overfill. Proper starting fuel level is a minimum of 20mm below filler neck. Do not re-fuel while engine is running. Allow engine to cool before re-fueling.
- Battery charge condition, terminal connections.
- Check engine control / monitoring panel. All gauges in proper working condition. All markings and labels in good condition.

Perform a thorough inspection of the hydraulic lift table and components:

Inspections are essential for proper operation and safety. Unit should be in the lowered position and the power should be turned off and “locked out”. Follow your standard electrical lock out tag procedure.

- Check oil level in the lift, add as necessary.
- Perform a general inspection of all mechanical fasteners.
- Inspect all metal component assemblies for structural and weld integrity.
- Check hydraulic lines for damage or leakage.
- Check electrical wiring for damage or deterioration.
- Inspect all pivot points. Bearings without grease points are permanently lubricated and require no servicing. Bearing or hinge points with grease points provided should be serviced.
- Clean area in and around lift so it is free of foreign objects or debris.
- Cycle hydraulic lift table through all motions prior to engine startup to purge air from cylinders.

SVU - 50

Startup Procedure

1. Position trailer to desired location. (Always position unit on as level and flat a surface as possible.)
2. Remove cover. (If provided)
3. Release ratchet strap, remove and stow.
4. Remove rear support bar and stow. (Unit may need to be tilted forward to allow bar to release. This can be done by turning on the power switch, and tilting as necessary.)
5. Position the 2 rear jacks on trailer. (Always leave trailer attached to tow vehicle and always deploy jacks when operating unit.)
6. Check for any overhead obstructions or debris in area of operation as they may interfere with safe operation of unit. (i.e. tree branches, power lines etc.) Do to the volume of air movement any loose debris may be pulled to the unit causing personal injury or damage to the unit.
7. Start the engine with the throttle in the idle position. Allow the engine sufficient time to reach oil pressure and ample warm up time.
8. Position unit to desired position for use by controls on either the hand held control or the fixed control panel with engine at idle.
9. Position throttle to desired RPM by the tachometer on the main control panel.
10. Monitor engine functions periodically on the gauge panel during operation.
11. If utilizing the flood light option, operate the engine at a minimum of 1600 rpm for the alternator to charge the battery sufficiently.
12. If a malfunction of any kind occurs the unit can be shut down via the emergency stop button on either the hand held or the fixed control panel. If the emergency stop button is used there is a 14 second delay before the unit can be restarted. Position the throttle back to the idle position before restarting the engine.
13. When ventilation is completed return the engine to idle and begin to reposition the unit for stowage. This can be done by either the individual swithches on the controls (tilt, rotate, elevate) or by simply pressing the auto park button. The engine does not need to be running for the lift, rotate or tilt features to be used.
14. Refer to the towing and transporting procedures to prepare the unit for moving. Allow time for the engine to cool prior to placing cover over the unit (if provided) this will prevent personal injury or damage to the cover.

Control Panels

10. Maintenance Schedule

This maintenance schedule is provided for end user reference. Timely and proper maintenance will help keep the unit in a safe and serviceable condition. All service is to be performed by qualified personnel. Accurate records should be kept for the service life of the SVU-50.

Task	First 15 Hours / 3 months	Every 25 Hours / 6 months	Every 50 Hours / 12 months	Every 100 Hours	Every 200 Hours
Change engine oil and filter	◙	◙			
Air filter, wash, dry, re-oil	◙	◙	◙	◙	
Air filter, replace					◙
Fuel filter, replace			◙		
Spark plugs, check gap, color	◙	◙			
Spark plugs, replace			◙		
Ignition wires, replace				◙	
Engine coolant, check	◙	◙	◙		
Engine coolant, drain, flush, replace				◙	
Battery condition	◙	◙	◙		
Check main drive belt	◙	◙	◙		
Replace main drive belt				◙	
Check timing belt and idlers				◙	
Replace timing belt and idlers					◙
Check alternator drive belt, tension	◙	◙	◙		
Replace alternator drive belt				◙	

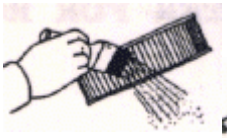
11. Servicing

Air Filter Servicing

Items required:-
K & N RECHARGER Filter Care Service Kit Part # 99-5000

Contains:

K & N Air Filter Cleaner -500m1 bottle.
K & N Air Filter Oil - 200ml aerosol is best.
Shallow Tray

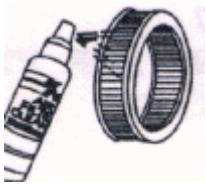


Tap the element to dislodge any large embedded dirt, then gently brush it with a soft bristle brush. Add cleaning solution to the shallow tray, 3/4 the depth of the pleats. Roll the filter in the tray, trying to prevent dirty solution running inside the filter.

Wait for up to 5 minutes, rinse filter from inside with water from the tap. Do not use high pressure. Shake off excess water & allow to dry naturally, best overnight.

Caution:
Use only K & N air filter cleaner!
Do Not use petrol, thinners paraffin etc.
Do Not use detergents.
Do Not steam clean!
Do Not use compressed air.
Do Not use hot air guns for drying.

The use of any of the above can cause harm to the COTTON filter media, plus shrink and harden the rubber end caps. Excess heat will shrink the cotton filter media. While compressed air will blow holes in the element.



- After air filter is completely dry, always re-oil before using. If using K&N aerosol - hold the can 3ins away & spray oil down into each pleat with one pass per pleat. Do Not go "round & around" WAIT 20 minutes for oil to spread. The white gauze should appear red, have no "white spots" and be drip less.

- If using K&N squeeze bottle - squeeze K&N air filter oil down into the bottom and along each pleat - only one pass per pleat. Let oil wick into cotton for 20 minutes. Re-oil any white spots still showing.

  Caution: Never use any oil other than RED K&N AIR FILTER OIL.
  Never use a K&N air filter without oil. (The filter will not stop the dirt without the oil.)
  K&N air filter oil is a compound of mineral and animal oil blended with special polymers to form a very efficient tack barrier. Red dye is added to show just where you have applied the oil. Eventually the red color will fade but the oil will remain and will filter the air.

Oil and Oil Filter Servicing

All directions indicated are interpreted as the viewer standing behind facing the rear of the SVU-50 looking through the shroud in the same direction as air flow.

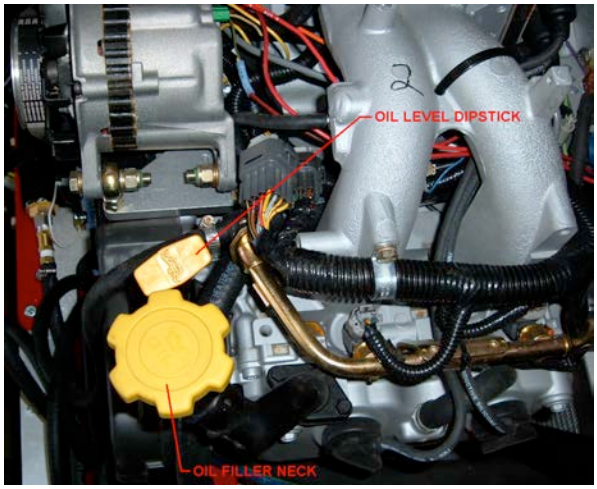
The oil level dipstick and fill neck are located on the top right side of the engine compartment. Dipstick and filler neck covers are yellow color coded.

Oil pan drain plug is located on the bottom left side of engine. Picture shown to the right is viewed from the bottom of engine compartment. Torque plug to 36 Nm.

Oil capacity 2.65 quarts.

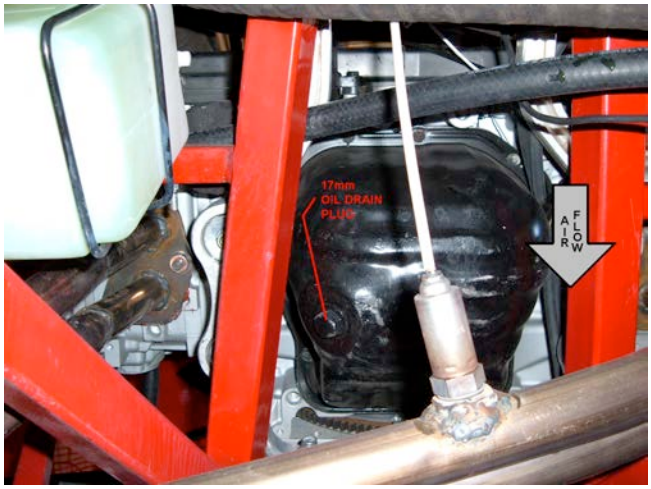
Oil filter is located on the lower left rear side of engine compartment.

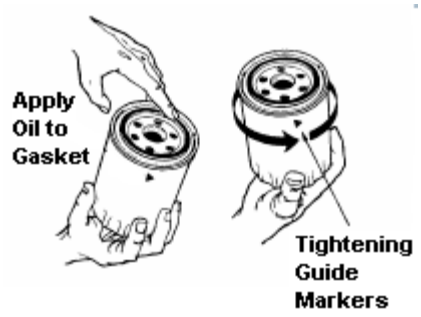
Oil filter capacity 0.25 quarts. Before installing new oil filter fill with new oil.

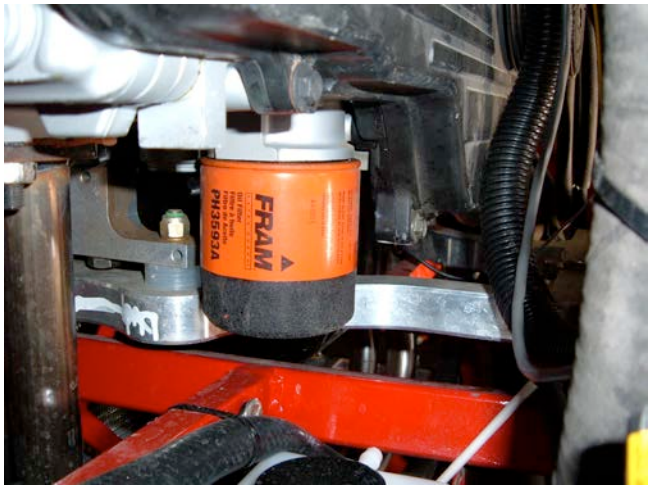


Total oil capacity during oil and filter change 3 quarts

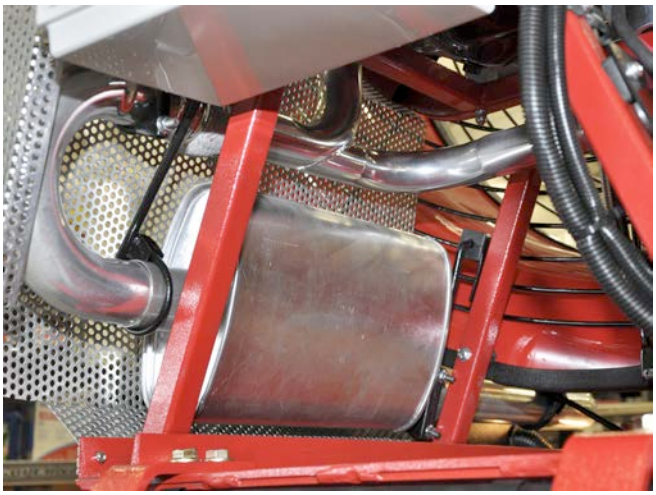
1. Unscrew oil filter and clean mounting base. Apply film of clean oil to filter gasket. Do not use grease.
2. Screw new filter on until gasket reaches base. Then tighten according to instructions on filter using tightening guide markers.
3. Add oil, idle engine for five minutes and check for leaks. Then add oil to “full” on dipstick.







Fuel Filter Servicing



The fuel filter is located on the lower rear right side of engine. Fuel filter is a disposable canister sized for 10mm fuel line.

1. Check to be sure the proper fuel filter is being installed.

2. When replacing the fuel filter, be sure there are no open fires in the area. Engine must be cold before attempting replacement.

3. Fuel systems may have residual pressure even after the engine is shut down. It is important that the system be depressurized before attempting to replace the fuel filter. To depressurize, loosen clamp securing OUTLET end of fuel filter first. Use a twisting motion to loosen the bond between flexible fuel line and fuel filter. Continue twisting motion to relieve any residual pressure in fuel line.

4. After fuel filter installation, run the engine and check for leaks.

Engine Coolant Air Purging / Replacement

All air must be purged from cooling system prior to operation. There are two coolant tanks located on the left side of engine compartment.

The painted metal tank is used for adding new coolant to the system.
The lower tank is the operational coolant overflow tank.

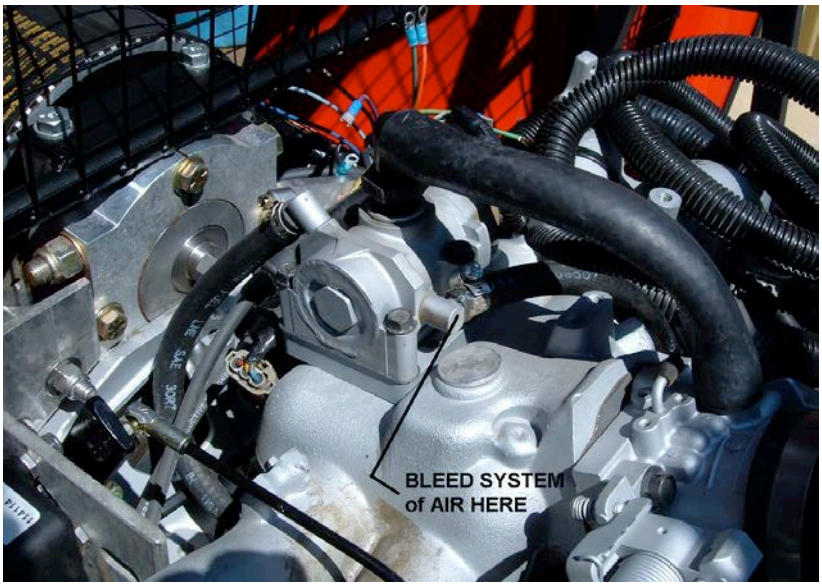
Coolant overflow tank has markings indicating the proper level of coolant required.

To drain system of coolant:

To avoid injury engine must be cold before draining coolant.

1. Relieve any residual pressure from system by slowly removing coolant fill tank cap.
2. Loosen clamp on lower radiator hose connection. Twist hose to break the bond between hose and metal radiator. Caution: radiator is constructed from aluminum and is easily damaged. To not use pry bars to remove hose.

Filling with Coolant, Purging Air



To make certain that all air is purged from engine it is necessary to bleed the system while filling with coolant.

Refer to photo to identify the coolant overflow hose on the engine. Loosen clamp and use a twisting motion to disconnect the hose from the engine.

Pour the 50 / 50 anti-freeze water mix in to the coolant fill tank slowly. Continue adding coolant mix until a steady stream of coolant exits the hose connection fitting.

Replace coolant overflow hose. Clamp securely. Continue to add coolant to the coolant fill tank. Coolant fill tank must be filled to within 10mm of the top of filler neck.

Add sufficient coolant to the overflow tank to bring the level up to the “LOW” mark.

Hydraulic Lift Table Fluid

Hydraulic fluid reservoir level should be inspected with the lift table completely collapsed, tilt platform horizontal. Checking at any other position can result in the incorrect amount of hydraulic fluid. Fluid level will fluctuate during use.

Before engine startup, purge all air from hydraulic system. To purge air, operate the lift table to the extremes of all motion a minimum of two times. Collapse and level the table, recheck fluid reservoir. Check for leaks.

CAUTION: Do not tamper with hydraulic control valves. Hydraulic system has been factory adjusted for optimum performance and safety.