MAINTENANCE SAFETY INSTRUCTIONS

WARNING

Improper practices or carelessness can cause burns, cuts, mutilation, asphyxiation or other bodily injury or death.

Read and understand all of the safety precautions and warnings before performing any repair. This list contains the general safety precautions that **must** be followed to provide personal safety. Special safety precautions are included in the procedures when they apply.

- Make sure the work area surrounding the product is dry, well lit, ventilated, free from clutter, loose tools, parts, ignition sources and hazardous substances. Be aware of hazardous conditions that can exist.
- **Always** wear protective glasses and protective shoes when working.
- Rotating parts can cause cuts, mutilation or strangulation.
- Do **not** wear loose-fitting or torn clothing. Remove all jewelry when working.
- Disconnect the battery (negative [-] cable first) and discharge any capacitors before beginning any repair work. Put a "**DO NOT OPERATE**" tag on the controls.
- Use ONLY the proper engine barring techniques for manually rotating the engine. Do **not** attempt to rotate the crankshaft by pulling or prying on the fan. This practice can cause serious personal injury, property damage, or damage to the fan blade(s) causing premature fan failure.
- If an engine has been operating and the coolant is hot, allow the engine to cool before you slowly loosen the filler cap and relieve the pressure from the cooling system.
- Do **not** work on anything that is supported ONLY by lifting jacks or a hoist. **Always** use blocks or proper stands to support the product before performing any service work.
- Relieve all pressure in the air, oil, fuel and the cooling systems before any lines, fittings, or related items are removed or disconnected. Be alert for possible pressure when disconnecting any device from a system that utilizes pressure. Do **not** check for pressure leaks with your hand. High-pressure oil or fuel can cause personal injury.
- To prevent suffocation and frostbite, wear protective clothing and ONLY disconnect fuel lines in a well-ventilated area.
- To avoid personal injury, use a hoist or get assistance when lifting components that weigh 23 kg [50 lb] or more. Make sure all lifting devices such as chains, hooks, or slings are in good condition and are of the correct capacity. Make sure hooks are positioned correctly. **Always** use a spreader bar when necessary. The lifting hooks **must not** be side-loaded.
- Corrosion inhibitor, a component of SCA and lubrication oil, contains alkali. Do **not** get the substance in your eyes. Avoid prolonged or repeated contact with skin. Do **not** swallow internally. In case of contact, immediately wash skin with soap and water. In case of contact, immediately flood eyes with large amounts of water for a minimum

of 15 minutes. IMMEDIATELY CALL A PHYSICIAN. KEEP OUT OF REACH OF CHILDREN.

- Naptha and Methyl Ethyl Ketone (MEK) are flammable materials and **must** be used with caution. Follow the manufacturer's instructions to provide complete safety when using these materials. KEEP OUT OF REACH OF CHILDREN.
- To avoid burns, be alert for hot parts on products that have just been turned off, and hot fluids in lines, tubes, and compartments.

- **Always** use tools that are in good condition. Make sure you understand how to use them before performing any service work.
- **Always** use the same fastener part number (or equivalent) when replacing fasteners. Do **not** use a fastener of lesser quality if replacements are necessary.
- Do **not** perform any repair when fatigued or after consuming alcohol or drugs that can impair your functioning.
- Some state and federal agencies in the United States of America have determined that used engine oil can be carcinogenic and can cause reproductive toxicity. Avoid inhalation of vapors, ingestion, and prolonged contact with used engine oil.
- Coolant is toxic. If not reused, dispose of in accordance with local environmental regulations.

GENERAL MAINTENANCE GUIDELINES

The unit should be checked at regular intervals for any slight increase in noise or heat that may develop in any part of the pump, including the coupling, stuffing box and bearings. See the Troubleshooting section at the end of this manual for help in diagnosing the cause of this problem.

The mechanical seal is primarily designed to prevent air being drawn into the back of the pump through the stuffing box. It also prevents gritty particles in the pumping liquid from entering the stuffing box. When servicing or replacing the seal, it is essential that precautions are taken to assure that the seal chamber is kept free of dirt. Though the mechanical seal is designed to allow the pump to run dry for prolong periods, the seal relies upon a constant supply of oil for both lubrication and cooling. Never run the pump without first checking the seal's oil reserve is full.

The pump end's bearings are grease lubricated. The bearing housing should be about one-third full of good ball bearing grease. Extreme care must be taken to assure that dirt does not contaminate the bearing grease. Too much grease in the bearing housing causes the bearing to run hot. Add small amount of grease every 3 to 6 months being careful to remove old grease if necessary to maintain the housing not more that 1/3 full.

Maintenance of the correct clearance between the pump end's suction cover and impeller significantly affects the operating efficiency of the complete unit. The pump end is supplied with replaceable wear rings that are designed to maintain the correct clearance. When the clearance increases by about .020" the rings should be replaced.

Summary of engine and pump lubricants			
Engine	Lubricating oil	All season	15W-40
		Winter	10W-30
		Artic	5W-30
	Oil filter	Fleetguard LF3345	
Pump	Mechanical seal oil	Mobil Rarus 4-27	
	Bearing grease	Esso Multi-P Purpose H or Texaco Multifak 2	