



Power Solutions International, Inc. Warranty Manual

Weichai M-Series Diesel Engine

**NOTE: THIS MANUAL MAY BE UPDATED FROM TIME TO TIME BY
POWER SOLUTIONS INTERNATIONAL, INC.**

Warranty Terms Applicable to engines with PSI sale date after November 1, 2023

**Power Solutions, Inc.
201 Mittel Drive
Wood Dale, IL 60191**

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|---|-----------|
| PRODUCT WARRANTY: | 3 |
| PSI LIMITED WORKMANSHIP WARRANTY: | 3 |
| DISCLAIMER OF WARRANTY: | 3 |
| BUYER’S REMEDIES: | 3 |
| BUYER’S REMEDIES (continued):..... | 4 |
| LIMITATION OF LIABILITY IN GENERAL: | 4 |
| ENGINE STORAGE PROTECTION:..... | 4 |
| MOR Emissions Warranty | 5 |
| REQUIREMENTS FOR SUBMITTING A WARRANTY CLAIM | 7 |
| Requirements of the Retail Purchaser | 7 |
| Warranty Parts Return Program | 8 |
| Mandatory Return Parts List | 8 |
| Photo Documentation..... | 8 |
| WARRANTY REGISTRATION | 9 |
| Responsibilities for Registration | 9 |
| How to Register an Engine | 9 |
| Warranty Start Date & Shelf Life Warranty | 9 |
| Engines AND Products sold with no warranty | 9 |
| Warranty Exclusions..... | 10 |
| Reimbursement | 11 |
| Service Labor Rates | 11 |
| Labor Time Reimbursement..... | 11 |
| Travel Policy | 11 |
| Parts Reimbursement | 11 |
| Service Parts Warranty Procedure | 11 |
| Sublet Repairs | 12 |
| Claim Submission | 12 |
| Important Required Information | 12 |
| Storage Protection Instruction | 13 |



PRODUCT WARRANTY: PSI warrants the product to be free from defects in workmanship and material. **The standard warranty period is 4 years or 1,000 hours (whichever occurs first) for emergency use standby applications.** The emissions warranty is documented on page 5 of this manual. PSI provides a separate limited workmanship warranty shown in below under “PSI LIMITED WORKMANSHIP WARRANTY.” The warranty will start no later than 12 months after the original ship date from PSI.

PSI LIMITED WORKMANSHIP WARRANTY: PSI warrants to the Buyer that the components installed by PSI will be properly installed in accordance with PSI's standard specifications for a period beginning upon the shipment of the Products by PSI and ending upon the first to occur of (i) one (1) year from the date of shipment of the Products by PSI or (ii) six (6) months from the date the Products are placed in service. There is no warranty in cases of negligence, abuse, abnormal usage, misuse, corrosion, over-loading, altered Products, accidents, fair wear and tear, failure to follow Supplier's instructions or improper installation, storage or maintenance. PSI's limited workmanship warranty is subject to the exclusions and limitations provided herein. Buyer's remedies for breach of the PSI limited workmanship warranty are specifically limited to the remedies provided for herein.

DISCLAIMER OF WARRANTY: Except as expressly provided herein, Supplier makes no further warranty of any kind with respect to the Products. SELLER DISCLAIMS AND EXCLUDES ALL WARRANTIES, WHETHER STATUTORY, EXPRESS, OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR OF CONFORMITY TO SPECIFICATIONS, MODELS, SAMPLES OR OTHERWISE. SELLER WILL NOT BE LIABLE FOR ANY GENERAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, INCLUDING WITHOUT LIMITATION ANY DAMAGES FOR LOSS OF USE OR LOSS OF PROFITS.

BUYER'S REMEDIES: Supplier's liability for any breach of any provision hereof is limited to either (i) repair or replacement of any nonconforming components of the Products, or (ii) upon return of the nonconforming Products to Supplier, credit to the Buyer of the amount paid therefore, whichever Supplier shall elect. Supplier's liability arising for any reason under this Agreement shall in no event be greater in the aggregate than the price paid by Buyer for the Products during the immediately preceding twelve (12) month period and, except as otherwise provided in this Power Solutions, Inc. Certified Engine Responsibility, Warranty and Procedures Manual, shall not include any labor, shipping or other costs incurred in connection with any repair, replacement, reinstallation, or reshipment. Buyer shall provide Supplier access to the Products as to which Buyer claims a purported defect or nonconformance. Supplier's obligation to repair, replace or credit shall only apply to Products that examination by Supplier or Supplier's representatives determines to have been defective under ordinary and normal use.

Upon request by Supplier, Buyer shall, at Buyer's own risk and expense (subject to reimbursement as set forth herein), promptly return the Products in question to Supplier's facility. Any Products that are repaired or replaced by Supplier shall be re-delivered to Buyer at Supplier's risk and expense. Supplier shall not be required to repair or replace more than the Products actually found by Supplier to be defective. No allowance shall be made for any expenses incurred by Buyer in repairing defective parts or supplying any missing parts except on the written consent of Supplier. Buyer is responsible for determining the suitability of Supplier's products for Buyer's use or resale, or for incorporating them into objects for applications that Buyer designs, assembles, constructs or manufactures. THE REMEDY

BUYER'S REMEDIES (continued):

SET FORTH IN THIS PARAGRAPH SHALL BE BUYER'S SOLE AND EXCLUSIVE REMEDY AGAINST SUPPLIER AND BUYER WAIVES ALL OTHER REMEDIES AGAINST SELLER. Buyer shall not debit, deduct, or withhold payment for issues regarding warranty work or parts or engines. This includes Product sent for warranty purposes. Warranty issues are separate from payment of invoices that are due within the payment terms. Warranty issues are to be resolved through Supplier's Warranty Department.

LIMITATION OF LIABILITY IN GENERAL: In no event whatsoever shall Supplier or any of its shareholders, directors, officers, affiliates, predecessors, successors and assigns, be liable to Buyer or any third party or any of their shareholders, directors, officers, affiliates, predecessors, successors and assigns, for any incidental, indirect, consequential, exemplary or special losses, damages, costs or expenses of any kind relating in any way to the manufacture and sale of the Products, the use of or inability to use such Products, or acts or omissions in connection herewith (including, without limitation, lost profits or the use of or the loss of use of any of the Products or other property). In no event shall Supplier's liability arising under this Agreement for any reason exceed, in the aggregate, the purchase price of the Products purchased hereunder during the immediately preceding twelve (12) month period.

ENGINE STORAGE PROTECTION: Engines need to be maintained per the recommendation (storage protection instruction). Any failure that occurs a result of improper storage will not be warranted for the related failure.

MOR Emissions Warranty

Your Warranty Rights and Obligations

Baudouin is pleased to explain the emission control system warranty on your new 2023 model year emergency stationary compression ignition emission certified engine. New emergency stationary CI internal combustion engines must be designed, built and equipped, and free from defects in materials and workmanship to meet the requirement in 40 CFR 60 IIII, 40 CFR 89, and 40 CFR 1039. Baudouin warrants the emission control system on your engine for the periods of time listed below provided there has been no abuse, neglect or improper maintenance of your engine according to 40 CFR 1068 and 40 CFR 1039.

Your emission control system may include parts such as the regulator or fuel-injection system, grid heater system, electronic control unit (ECU), harness, and air induction system. Also included may be sensors, hoses, belts, connectors and other emission-related assemblies.

The warranty period begins when the equipment is first placed into service. Where a warrantable condition exists, your engine will be repaired or component be replaced by Baudouin at no cost to you, including expenses related to diagnosing and repairing or replacing emission-related parts. This is your General Emissions Warranty.

Emissions Warranty Part Warranty coverage

The new 2023 model year emergency stationary compression ignition engines are warranted for 5 years or 3,000 hours, whichever comes first. If any emission-related part on the engine is defective, the part will be repaired or replaced by Baudouin.

Owner' s Warranty Responsibilities

As the nonroad compression ignition engine owner, you are responsible for the performance of the required maintenance listed in your owner's manual. Baudouin recommends that you retain all records covering maintenance on your nonroad engine, but Baudouin cannot deny warranty solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.

As the nonroad compression ignition engine owner, you should however be aware that Baudouin may deny your warranty coverage if your engine or a component has failed due to abuse, neglect, improper maintenance, use of improper fuel or unapproved modifications per 40 CFR 1068.115.

Your engine is designed to operate on ultra-low-sulfur diesel fuel. Use of any other fuel may result in your engine no longer operating in compliance with applicable emissions requirements.



As an owner or operator of an emergency stationary ICE, you must operate the emergency stationary ICE according to the requirements in 40 CFR 60.4211.

You are responsible for initiating the warranty process. Baudouin suggests that you contact a Baudouin dealer as soon as a problem exists. The warranty repairs should be completed by the dealer as expeditiously as possible.

If you have any questions regarding your warranty rights and responsibilities, you should contact PSI at 888-331-5764 or via email at Service@psiengines.com.

By mail, please contact the PSI Warranty Department at:

Power Solutions International, inc.
201 Mittel Dr.
Wood Dale, IL 60191
United States of America

What is Covered

Below is a list of the systems that affect emissions on your engine. Emission control components on these systems are covered by the emissions warranties as applicable.

If failure of one of the components listed below results in failure of another part, both will be covered by this warranty. For detailed information concerning specific components covered by these emission control systems warranties, ask your dealer.

General Emissions Warranty Parts List – 5 years or 3,000 hours, whichever comes first

1. Air-induction system including turbocharger.
2. Fuel system including injectors and lines.
3. Sensors (manifold pressure and temperature, coolant, etc.).
4. Electronic control units.
5. Grid Heater
6. Engine harness



REQUIREMENTS FOR SUBMITTING A WARRANTY CLAIM

The OEM/Buyer must substantiate the in-service date for all engine and service part claims. PSI, at its sole discretion, may require the Service Dealer, Distributor or

OEM/Buyer to provide a proof of purchase receipt.

The engine **In-Service date** should be registered in the PSI Cloud Based Portal or at the public customer portal (www.psiengines.com/service)

The OEM/Buyer must assess all repairs for warranty eligibility. PSI, at its sole discretion, may audit the OEM/Buyer for compliance with its warranty policy.

The OEM/Buyer must file all claims with PSI within 30 days of the date of repair.

The OEM/Buyer must maintain, in readily available format, all claim supporting records for 12 months from the credit/payment date of the claim. Supporting records from denied claims should be archived and maintained for 4 years from the date the claim was denied.

The OEM/Buyer must adhere to the Warranty Parts Return Program procedures specified in this manual. Any parts not requiring return must be retained for 90 days following the repair.

Claims must be submitted to PSI by the OEM or OEM dealer directly in the PSI Cloud based warranty system.

Requirements of the Retail Purchaser

The retail purchaser shall notify the OEM/Buyer or PSI of any such defective part that the purchaser obtains knowledge of within 30 days from the time the purchaser obtains such knowledge.

Any retail end user of OEM equipment powered by a PSI engine must provide proof of purchase to the servicing agent if the engine has not been previously registered in the PSI Warranty System.



Warranty Parts Return Program

Parts are required to be returned to PSI within 30 days after the date PSI provides an RMA.

OEM/Buyers are required to return certain components that are replaced under warranty.

A list of mandatory return parts is shown below. Reimbursement for freight is allowed on approved warranty claims provided parts are returned by United Parcel Service ("UPS") ground or other economical, nationally recognized delivery service. In addition, freight receipts are considered claim supporting documentation and must be held with the claims supporting records in accordance with the retention policy for supporting documentation.

PSI warranty representatives will send an electronic reminder to the submitter, for any parts requiring return, while processing the claim. It is in the submitter's best interest to ship the mandatory return parts back to PSI as soon as possible when the RMA is issued.

Credit or payment for any claim will not be processed until the parts have been received back by PSI. The parts and package being returned to PSI must both be clearly marked with the PSI Warranty RMA number. Parts should be shipped to: Warranty Department, Power Solutions, Inc., 1465 Hamilton Pkwy, Itasca, IL 60143.

Mandatory Return Parts List

All parts are subject to the mandatory return policy.

Photo Documentation

All claims require photo evidence of the engine serial data plate, the failed part, and hour meter (when applicable). The photo documentation should be submitted with the claim at the time of claim submission.

WARRANTY REGISTRATION

Responsibilities for Registration

OEM's, OEM Dealers, or end users all have the ability to register the engine warranty. Failure to register the engine warranty may result in the product receiving a shorter warranty than allowed per the standard warranty terms in this document.

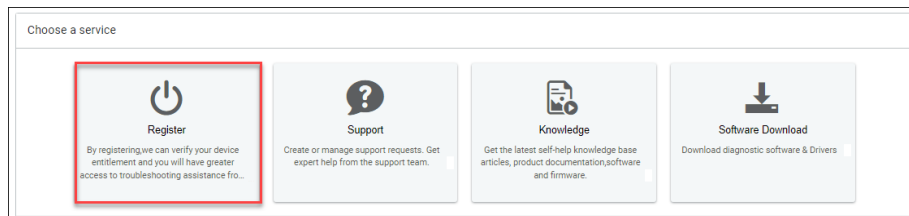
In-Service Dates are automatically calculated based on the date of sale from PSI to OEM Customer. The calculation is such that the in-service date will automatically be estimated as 90 days from the date of sale. The OEM, OEM Dealer, or End user is responsible for registering the engine in which the correct/accurate in-service date will then be applied to the engine warranty. Failure to register the engine with the correct in-service date may lead to a shorter warranty term for the product since the in-service date may be at a later date than what is calculated automatically.

How to Register an Engine

OEM Customers can use the credential based PSI Portal to update the in-service date

OEM Dealers or End Users will use the non-credential based website www.psiengines.com/service to register the engine warranty.

The training video on this process can be viewed in the public portal knowledge section which is also [linked here](#).



Warranty Start Date & Shelf Life Warranty

The warranty period will begin when the engine is sold to the end user ("In-Service Date").

The engine shelf life warranty is a maximum 12 months from ship date from PSI. In cases where the engine is not put into service after 12 months from ship date from PSI, the warranty will automatically start after 12 months have expired.

Engines AND Products sold with no warranty

Engines sold for prototype development, application validation, testing or durability are not covered by standard warranty.

Warranty Exclusions

The following items are not reimbursable under the PSI warranty terms.

- Any repair on an engine that has exceeded the hour or time limitation of the stated warranty.
- PSI may deny any claims that in their sole discretion are the result of misapplication of the engine or part.
- Any repair on an engine where the hours of operation or in-service date has been misrepresented.
- Any repair on an engine if the hour meter has been altered so that the true hours on the engine cannot be determined.
- Engines damaged by an Act of God or force majeure.
- Routine maintenance repairs
- Repairs required due to improper storage precautions.
- Repairs required due to extended storage time which has caused a product failure
- Repairs caused by poor workmanship on prior repairs.
- Adjustments made to improve performance beyond PSI estimated normal standards.
- Use of other than genuine OEM parts, unless in an emergency.
- Repairs to parts that, upon analysis, are found not be defective.
- Repairs to engines used for re-powering on-road vehicles.
- All consequential expenses, including, but not limited to, those resulting from equipment failure such as food, downtime, or replacement equipment rental.
- Towing or transportation expense for moving an engine or engine-powered equipment from the customer location to the repair location.
- Specialty equipment rentals such as cranes, hoists, or other equipment.
- Any failure caused by poor fuel quality
- Any failure caused by lack of maintenance or improper maintenance
- The use of an emergency standby engine in a non-emergency application
- Freight damage during transportation unless otherwise agreed to by PSI
- Any failure caused by using improper fluids or lack of fluid maintenance
- Failures or product issues that occur as a result of the application or environment, including allowable starting time requirements and ability to pull desired load.
- Improper installation or application
- Incorrect use relative to designed power rating or application requirements



Reimbursement

Service Labor Rates

Subject to the terms and conditions contained in this manual, the service labor rate is that rate that will be applied to all warranty repairs performed by the OEM/Buyer. Labor reimbursement will be limited to the average geographical labor rates that are already established in the OEM/Buyer's area of operation, not to exceed \$120.00 USD per hour. PSI does not reimburse for overtime or premium labor rate charges.

Labor Time Reimbursement

Labor time will be reimbursed per PSI labor time guide. PSI will provide you the labor time guide as requested. Seller shall not be responsible for any additional or incidental labor costs or expenses associated with warranty claims.

In no case will labor time to gain access or close access to an engine or piece of equipment be reimbursable by PSI. Labor times are equivalent to replacing a part from an exposed engine.

Travel Policy

PSI will reimburse for travel up to 2 hours labor and 120 miles round trip. Travel time is reimbursed at a maximum of \$120.00/hour plus \$1.20/mile. In cases where round trip mileage is over 300 miles accommodation reimbursement can be claimed. The reimbursement for accommodation is \$60.00/day with a maximum of 3 days. Seller can provide 1 day's accommodation fee for every 8 labor hours required. If less than 8 labor hours, no accommodation fee will be reimbursed.

Parts Reimbursement

Subject to the terms and conditions contained in this manual, PSI will reimburse the OEM/Buyer at the sellers selling price to buyer plus 20% allowable markup. Engine replacements are subject to a flat fee markup of \$500. Occasionally, an emergency repair may require the use of service parts supplied through other channels. PSI will review these instances on a case-by-case basis. If PSI elects to extend coverage for parts on such repairs, reimbursement will be limited to the acquisition cost, up to the cost of like PSI parts.

Transportation costs for returning Mandatory Return Parts is reimbursable at actual cost, providing parts are returned via United Parcel Service ground or other nationally recognized delivery service. Service agents must have freight receipts available upon request of PSI.

Service Parts Warranty Procedure

Service replacement parts receive a 90 day parts only warranty. Labor, failure due to wear, and travel are not covered by PSI.



Warranty claims for service parts should be processed through the PSI warranty department.

All warranty claims should include the original invoice and should include a date stamp on the invoice.

Sublet Repairs

Reimbursement for sublet repairs is at the actual cost of the repair subject to the terms in this manual including labor time allowance and labor rate reimbursement.

Claim Submission

Claims are required to be submitted by the OEM or OEM dealer directly into the PSI Cloud Based warranty portal. If you do not have access credentials to the warranty portal please reach out to your PSI Warranty contact or signup using the link located in the “Announcement” section at www.psiengines.com/service

Important Required Information

Buyer is required to provide photos of the engine nameplate, hour meter, and failed parts when the claim is submitted. Failure to provide photos will result in claim denial.

Allowable Time to File Claims

Claims must be received by PSI in the warranty portal within 30 days of the repair date. Failure to comply may result in claim denial.

PSI may request additional information during claim processing, the OEM must answer all such requests within 14 days. Failure to comply may result in claim denial.

OEMs must maintain, in readily available format, all supporting documents for claims for 12 months from the credit/payment date of the claim. Supporting documents for denied claims are required to be archived and maintained for 4 years from the date the claim was denied. All claims and supporting documents are subject to audit by PSI. If supporting documents are not available, or do not support a claim, the claim is subject to charge-back.

Sublet labor, freight or non-PSI part receipts must be retained by the OEM. Any OEM submitting manual claims must attach such receipts to the claim.

PSI reserves the right to alter our Policies & Procedures from time to time at our sole discretion.

Storage Protection Instruction

- 1.1 Necessity of Anti-rust Protection**
- 1.2 Storage Environment Requirement**
- 1.3 Preparation before Storage**
- 1.4 Shorter Term Storage**
- 1.5 Necessary Materials**
- 1.6 Long Term Storage (More Than Three Months)**
- 1.7 Removal from Storage**
- 1.8 Initial Running after Storage**

Storage Protection Instruction

NOTICE !

Weichai engine oil seal period can be maintained for one year, if over the one year oil seal period, the engine shall be protected against rust according to the storage protection instructions in this section.

1.1 Necessity of Anti-rust Protection

If your engine is out of operation and using, and is not expected in short term, precautions should be taken to protect your engine from damage and ensure proper operation when you return to full production.

The recommendations indicated below are designed to prevent damage to the engine when it is withdrawn from service for a prolonged period. Use these procedures after the engine is withdrawn from service. Where necessary protect the engine against frost damage.

1.2 Storage Environment Requirement

If the engine is placed into storage, the following precautions should be taken to protect it.

Equipment must be kept clean.

- Store indoors, cover it with a VCI plastic bag.
- Keep covered to eliminate airborne dust and dirt.
- Cover openings for ventilation, conduit connections, etc., to prevent entry of rodents, snakes, birds, insects, etc.

Equipment must be kept dry.

- Store in a dry area indoors.
- Temperature swings should be minimal to prevent condensation.
- If stored in an unheated or damp building, space heaters will be required to prevent internal condensation.
- Treat unpainted flanges, shafts, drive discs, and fittings with a rust inhibitor.
- Check insulation resistance of all windings before starting the engine. If readings are low, the windings must be dried.

1.3 Preparation before Storage

- Clean the engine of any dirt, rust, grease, and oil. Inspect the exterior. Paint areas that contain paint damage with good quality paint.
- Remove any dirt from the air cleaner(s). Check all seals, gaskets, and the filter element for damage.
- If engine must be stored outside, cover it with a waterproof canvas or other suitable protective material and use a strong waterproof tape.

1.4 Shorter Term Storage

Up to one week

- No special treatment is necessary.
- Just clean the area around the engine body.

Up to three months

Each week operate the engine until the normal temperature of operation is reached. If the engine doesn't have the start conditions, for example: doesn't have the start equipment, etc. Turn the crankshaft manually, in the normal direction of rotation (anti-clockwise as seen on the flywheel), a minimum of three revolutions.

1.5 Necessary Materials

Calibration oil

Calibration Oil is a low viscosity mineral oil based test fluid.

Calibration Oil is a calibration and storage oil for diesel fuel system, the rust preventative properties of this oil are such that, without cleaning of the equipment after calibration, proper functioning of the equipment is ensured after one year storage in normal conditions.

Safety protection is recommended when in contact with this product, such as barrier cream or rubber gloves.

VCI oil

Volatile corrosion inhibitor (VCI) provides liquid and vapor protection to ferrous metal surfaces against corrosion caused by moisture. In a closed compartment, protection is either by direct contact with VCI oil or by contact with VCI vapors. Contact your local supplier for similar type oil.

VCI oil can be used in all tanks, engine, fuel tank, hydraulic tank, power steering tank, transmission, differential, and other components. The inhibitor is an oil stabilizer and a rust preventative.

To be successful when treating an engine with VCI oil, the engine must be sealed when stored. VCI oil is so volatile that any opening left unsealed will allow the vapors to escape, causing the engine to lose protection.

NOTE!

- ◆ **VCI oil should not be used full strength on non-ferrous metals where the inhibitor will have direct, prolonged contact.**
- ◆ **The inhibitor can be used in combination with any petrochemical. Apply by using a spraying or fogging pattern. The VCI oil must be diluted according the instruction of suppliers.**

VCI oil cleaning method

- Drain the VCI oil from the engine.
- Refilled standard-compliant engine lubricating oils. For lubricating oil, please refer to the manual "Fluids RECOMMENDATIONS Diesel".
- Operate the engine for 5 minutes at low idle rated speed.
- Drain the oil and refilled new lubricating oil, complete cleaning.

Sprayer

Load the VCI oil dilution into the sprayer, then can be used to prepare the engine for storage.

Change the nozzle adjustment in order to provide either a spray or a fog pattern.

VCI oil dilution: mixture of 50 percent VCI oil and 50 percent engine oil.

Plastic bag

Use ultraviolet light resistant plastic bags. If a Volatile Corrosion Inhibitor (VCI) oil is used inside of the bag and the bag is sealed, the bag must have a minimum thickness of 0.10 mm (0.004 inch).

Waxed paper

Wax paper is a surface-coated wax that has excellent water and oil resistance.

Wrap parts and sealing to prevent rust.

Adhesive tape

Use a sealing tape with appropriate adhesive properties. DO NOT use duct tape because duct tape will loosen over a short time. Rolls of sealing tape that are 2 inches wide are recommended. An appropriate quality sealing tape is available from the following suppliers: 3M Product Information Center.

Biocide

Diesel Fuel Biocide prevents the growth of small organisms in the diesel fuel, use diesel fuel biocide such as Biobor JF or equivalent.

1.6 Long Term Storage (More Than Three Months)

NOTE ! In the long term storage, anti-rust process should be operated every six months.

Lubricating oil system

Drain and replace the crankcase oil and change the oil filters.

Add VCI oil to the crankcase at the rate of 3 to 4 percent by the volume of the crankcase. Or use special engine rust-proof oil, such as Houghton Ensis Engine Oil 30 Shell Rimula R6Im, or other equivalent effects product, please follow the supplier's instructions.

NOTE! If the engine crankcase is full, drain enough engine oil so the mixture can be added.

Coolant system

Drain coolant, use the pure water to flush the cooling system immediately. Then refill with appropriate coolant right now. Recommended to use VCI-coolant. It is not necessary if engine is to be stored less than three months. However, for longer storage periods such as more than three months, it is recommended that the cooling system be drained, flushed, and refilled.

Recommend Total Glacelf Auto Supra concentrates, BasfGlyscorr P113 concentrates, or other equivalent effects product, please follow the supplier's instructions.

NOTE!

- ◆ **If the stored engine will be subjected to below freezing temperatures, completely drain the fresh water system. The system can be drained by removing the drain plugs from the engine block, oil cooler, heat exchanger body, and radiator.**
- ◆ **The mixture must NOT contain less than 50% inhibited ethylene glycol or propylene glycol, and may contain up to 90% by volume.**

Fresh Water Systems

Drain coolant from cooling system and thoroughly flush with clean water. The system then should be refilled with mixture of clean water and any of the coolant preservative containing VCI. If the storage less than three months, drain mixture of clean water and any of the VCI coolant from cooling system after finished running of the engine.

For clean water, please refer to the manual "Fluids RECOMMENDATIONS Diesel".

Raw Water Systems

Completely drain the raw water system by removing all the drain plugs from the raw water pump, water shield manifolds, heat exchanger bonnets, and aftercooler. After the system has been drained, inspect all zinc plugs (normally painted red) for corrosion damage.

NOTE!

To ensure complete drainage and evaporation during storage, DO NOT install the drain plugs and zinc plugs. Place all removed plugs in a cloth bag and fasten the bag to the engine for storage.

Caution!

When finished all above operations of lubricating oil system and coolant system, then start the engine for 5 minutes at low idle rated speed.

Turn off the engine, and wait about 30 minutes, fully cooled, then make operations as follows.

Fuel system

Calibration oil

Calibration oil is the preferred choice as a preservation fluid because the calibration oil contains Rust and Oxidation inhibitors.

Recommend Castrol calibration oil 4113, please follow the supplier's instructions.

Fuel filter

Remove the fuel from the secondary fuel filter housing or empty and reinstall the spin-on fuel filter element to remove any dirt and water. Drain the fuel injection pump (sleeve metering only). Clean the primary fuel filter. Fill with calibration oil. Install the primary fuel filter and operate the priming pump. This will send clean oil to the secondary filter and engine.

Fuel tank

Open the fuel tank drain valve and allow any water or dirt to drain from inside the fuel tank. Apply a VCI oil of 30 ml per 30 L (1 oz per 7.50 gal) of fuel tank capacity to prevent rust in the fuel tank. Add 0.15 ml per L (.02 oz per 1 gal) of commercial biocide such as Biobor JF or an equivalent to the fuel.

Fuel nozzle and spark plug

Remove the fuel nozzles or spark plugs and apply 30 ml (1 oz) of VCI oil mixture (50 percent VCI oil and 50 percent engine oil) in each cylinder.

Use a bar or turning tool to turn the engine over slowly to put the oil on the cylinder walls. Install all fuel injector or spark plugs and tighten to the correct torque.

Intake and exhaust system

Air filter

Remove the air filter elements. Seal the air filter inlets, with VCI plastic bag and adhesive tape.

Use the starter to drive the engine, but no fuel. Then use a sprayer to add VCI oil dilution into the air inlet and turbocharger inlet, spray for three to five seconds once time, recommend five to ten times.

Exhaust openings

Use a sprayer to apply VCI oil dilution into the exhaust openings. The minimum application rate is 5.5 ml per L (3 oz per 1000 cu in) of engine displacement. Seal the exhaust pipe, including any drain holes in the muffler.

Vents

All vents i.e. engine inlet pipe, exhaust pipe, air cleaner inlet, coolant inlet & outlet, crankcase breather, the crankcase breather and all other openings etc. must be carefully sealed with VCI plastic bag and adhesive tape.

NOTE!

VCI oil mixture can also be added to the inlet by removing the plug for checking turbocharger boost pressure. The minimum application rate is 5.5 ml per L (3 oz per 1000 cu in) of engine displacement.

Electrical system

Battery

Battery for engine starting, if provided, should be disconnected and stored in a cool, dry place after ensuring electrolyte level (refill with distilled water if necessary). It is recommended to recharge the battery every one month.

Starter

Clean electric starter and wire harness, keep dry, then cover the alternator in mouldable waxed paper, and seal with adhesive tape.

Alternator

Cover the alternator in mouldable waxed paper, and seal with adhesive tape.

Engine wiring harness

Clean engine wiring harness, and keep dry.

The others**V-belt**

Loosen all the belt (tension, fan, alternator, etc.)

Flywheel

Spray a thin amount of VCI oil mixture on the flywheel, ring gear teeth, and starter pinion. Install the covers to keep in the VCI vapors.

NOTE!

Use a VCI plastic bag cover over the engine. Ensure the engine cover is secure, but loose enough to allow air to circulate around the engine to prevent damage from condensation, and put some desiccants, then seal with adhesive tape.

Attach a tag to the engine with a notation of the date that the unit was preserved.

Remove the waterproof cover every three months and check the engine for corrosion. If the engine has signs of corrosion at the check period, repeat the protection procedure.

1.7 Removal from Storage

Refer to the appropriate section for detailed services listed below or have your authorized servicing dealer or engine distributor perform services that you may not be familiar with.

- Remove all outside protective covers. Unseal all openings in engine and remove covering from electrical systems.
- Change the oil and filters. Then drain the oil and refilled with new lubricating oil. For lubricants, please refer to the manual” Fluids RECOMMENDATIONS”.
- Drain the VCI coolant from the engine. Use clean water to flush any compartment that contains VCI coolant in order to removal all residual VCI coolant. Then drain the clean water and refilled new coolant. For coolant, please refer to the manual” Fluids RECOMMENDATIONS”.
- Replace the fuel filter elements and fill fuel tank with diesel fuel.(Gas machine does not need to do this operation)
- Check battery level.
- Check the condition of the fan and alternator belts. Replace the belts, if necessary. Tighten the belts as specified in the Operation & Maintenance Manual.
- Check the engine harness, and the harness is not aging. Replace the harness, if necessary.
- Remove the batteries from storage. Install batteries (fully charged) and connect the electric wires.
- Install fan/alternator poly-vee belt if removed.
- Perform all appropriate pre-starting checks.
- Please assemble all the others parts back in engine.

1.8 Initial Running after Storage

The purpose of this operational check is to ensure that the correct pressures and temperatures are kept in the lubrication, cooling, and fuel systems. Also, the operation ensures that any leaks are corrected.

To ensure a safe, uniform check at initial start, use the following procedure:

- Before starting the engine, use hand oil pump or electric pre-supply pump to establish the oil pressure of the engine.
- Crank engine for 20 seconds with starter (do not allow the engine to start). Wait 2 minutes and crank engine an additional 20 seconds to assure bearing surfaces are adequately lubricated.
- Start engine and run at low idle and no load for several minutes. Warm up carefully and check all gauges before placing engine under load.
- Operate the engine at least 10 minutes at idle speed.
- Check frequently for leaks such as oil, coolant, and fuel during the first few hours of operation. Repair any leaks as soon as detected.

Check all kinds of indicators to confirm that there is no abnormal, if there are abnormal parameters, please handle it promptly.