

Description

VCI (Vapor Corrosion Inhibitor) Preservation Methodology of Armored Vehicles, Battle Tanks, and Transport Vehicles over Cycles of Two Years.

Background

The present invention relates to a VCI Preservation Methodology of Armored Vehicles, Battle Tanks, and Transport Vehicles

In these days of downsizing of manpower and declining population, Armed Forces throughout the world are looking for a more efficient way to preserve the military equipment listed above.

Currently, in order to maintain its land vehicles at operational readiness at all times, the Armed Forces utilizes manpower to manually change the engine oil of every vehicle every three months, according to Original Equipment Manufacturers' recommendations, in addition to getting the engine started and running. The repetition of this manual procedure every three to four weeks is both tedious and time-consuming. Very often, accidents occur. Moreover, to the Army's dismay, it does not effectively keep the armoured vehicles and battle tanks in pristine condition. Over time, parts and joints begin to corrode, rubber and electrical components break down and require replacements. Manual maintenance becomes altogether too costly.

Humidity, moisture, and large temperature variations stemming from condensation take their toll on vehicles left to stand both indoors and outdoors. Gearboxes, engines and even replacement parts are highly susceptible to changes in humidity. Weapon systems and electronic systems, in particular, are prone to breakdowns if left in an atmosphere of uncontrolled humidity. Oil and grease cause degeneration over time when exposed to high humidity. This leads to the break down of components and severely reduces the life span of the vehicle.

Aging is a collective term for changes in property of materials that occur on longer term storage without the action of chemicals and controlling the humidity of the environment. This leads to partial or complete degradation, which occur in the form of degradation processes and crack formation.

Rubber seals are especially prone to such aging effects if left unprotected. The unsaturated groups in rubber present sensitivity toward oxygen, ozone, UV irradiation, bacteria attack and other active substances. These reactions cause changes in the rubber seals and result in leakages of the hydraulic, fuel and lubrication system.



SUMMARY OF THE INVENTION

The current method is an old fashioned and tedious way which requires heavy dependence on physical manpower for maintaining the operational readiness of the abovementioned vehicles and equipment.

The intention of the present invention is to create a new method and the integration of its apparatus into a preservation system for above said vehicles and equipment without experiencing the drawbacks referred to above.

A special object of the invention is to develop an effective method using a range of Vapor Corrosion Inhibitor products to protect the said vehicles from corrosion and at the same time reduces the need of manpower after the said vehicles and equipment are kept in storage.

Another object of the invention is reducing the time or manpower required to change the engine oil of every vehicle every three to six months, thereby enhancing operational readiness and better deployment of soldiers to combatant role.

A further object is to keep the said vehicles operational ready by providing a total preservation to the chassis, fuel system, lubrication system, cooling system, hydraulic system, electrical and electronic system, rubber parts, weaponry system, steering system, gear boxes, engines, optics, and exhaust system.

DETAILED DESCRIPTION OF THE INVENTION

In accordance with this discovery, it is an object of the invention to provide the novel process involved and the VCI products used for preservation of the afore-mentioned vehicles.

The novel process and the VCI products used are herein described.

The invention relates to a VCI preservation methodology over cycles of two years of Armored Vehicles, Battle Tanks, and Transport Vehicles using a range of VCI (Vapor Corrosion Inhibitor) products.

In an embodiment of the invention as shown in figure 1 the preservation method consists four methodological and detailed stages; first stage beginning with Zero Point Maintenance is a compulsory service task which is conducted at the second stage before storage. The vehicle then undergoes the preparation stage of general cleaning, lubrication and treatment of inherent corrosion.

The third stage involves the application of VCI products in the engine, differential and transfer case, steering system, engine transmission, final drives, cooling system, fuel system, hydraulic system, exhaust system, optics, rubber components, electrical and electronic systems and connectors, weaponry system, suspension system, auxiliaries equipment, driver and crew compartment and moving parts such joints.

Once the VCI application is complete, the fourth stage involves sealing of the entire vehicle and then it will be covered with VCI canvas and kept in storage for 2 years before it is mobilized for operational purposes.

Another embodiment of the said invention is the Zero Point Maintenance, involving the change of engine lubricant, oil filters, fuel, fuel filters, gear lubricant, hydraulics oil and if required, repairs to the vehicle to ensure its operational efficiency.

Another embodiment of the said invention is the Preparation stage involves the cleaning the interior and exterior of the vehicle with VCI Cleaning Agent and the treatment of the inherent rust of the vehicle with VCI Rust Converter.

A further embodiment of the said invention involves the Application of VCI Products on all the essential systems and compartments of the vehicles spelled out below in the detailed preservation procedure of the vehicles.

By way of example and not limitation, the following are illustrative of various embodiments of the foregoing VCI preservation methodology for Armored Vehicles, Main Battle Tanks and Transport Vehicle.

Example 1:

The details of VCI Preservation Methodology of armoured vehicle is herein described;

1.0 FIRST STAGE: ZERO POINT

1.1

Zero Point involves the changing of engine oil, oil filters, steering oil, engine transmission oil, hydraulic fluids, fuel, and fuel filter.

2.0 SECOND STAGE: PREPARATION OF VEHICLE

Clean the interior and exterior of Armoured Vehicle with Water Based V.C.I. Degreaser.

2.1. Treat all existing corroded parts with VCI Rust Converter.

2.2. Lubricate door hinges and all moving parts of vehicle with V.C.I. Grease.

3.0 THIRD STAGE: APPLICATION OF VCI PRODUCTS ON THE ESSENTIAL SYSTEMS OF THE ARMoured VEHICLE

3.1. ENGINE

- 3.1.1 Drain out lubricating oil, refill with 90% of new oil and add 10% of V.C.I. Oil Additive via Filler Cap.
- 3.2. TRANSMISSION & TRANSFER CASE
 - 3.2.1 Drain out lubricating oil, refill with 90% of new oil and add 10% of V.C.I. Oil Additives via Transmission and Transfer Case Filler Plug.
- 3.3. FINAL DRIVES
 - 3.3.1 Drain out lubricating oil, refill with 90% of new oil and add 10% of V.C.I. Oil Additives via Final Drives Filler Plugs.
- 3.4. SWIVEL HOUSING LEFT AND RIGHT
 - 3.4.1 Drain out lubricating oil, refill with 90% of new oil and add 10% of V.C.I. Oil Additives via Swivel Housing Filler Plug.
- 4.0. FUEL SYSTEM
 - 4.1. Top up VCI Fuel Additives (1% of full tank capacity) into the fuel tank.
 - 4.1.1. Run engine for 3-5 minutes at idling speed. A few times during the period, speed up engine to top speed.
 - 4.1.2. Leave fuel lines filled with fuel fortified with VCI fuel additives. Do not remove fuel.
 - 4.2. Rubber Components
Apply Silicon fluid on all rubber hoses and rubber parts.
- 5.0. COOLING SYSTEM
 - 5.1. Drain out coolant, refill with 95% of new coolant and 5% of VCI Coolant Additives.
- 6.0. PROPELLER SHAFTS
 - 6.1. Grease propeller shaft universal joints and sliding joints with V.C.I. Grease via all grease nipples.
- 7.0. POWER STEERING
 - 7.1. Drain out hydraulic fluid and refill with new fluid and add 5% of VCI hydraulic additives.

8.0. BRAKE SYSTEM

- 8.1. Grease brake shoe adjuster, pivot points and all brake linkages with V.C.I. Grease.

9.0. CLUTCH SYSTEM

- 9.1. Depress clutch paddle and insert wooden block into clutch lever.

- 9.1.2. Spray V.C.I. Powder into the clutch chamber.

10.0. VEHICLE ROAD TEST

- 10.1. Start engine, drive for 1 km and check for leaks.

11.0. ELECTRICAL SYSTEM

11.1. Relay Box

- 11.1.1. Spray all connectors in the relay box with V.C.I. Electro Spray and install V.C.I. Emitter. Spray starter motor solenoid contact point with V.C.I. Electro Spray.

12.0. Power Distribution Box

- 12.1. Spray all connectors contact point with V.C.I. Electro Spray and install V.C.I. Foam Emitter.

12.2. Connectors

- 12.3. Spray all connectors with V.C.I. Electro Spray and install V.C.I. Emitter.

12.4. Slave Receptacle

- 12.4.1. Coat slave receptacle with V.C.I. Wax.

13.0. Battery Terminal

- 13.1. Remove cable connection point from battery and coat with V.C.I. Wax. Return battery to authority for maintenance.

14.0. Starter Motor

- 14.1. Lubricate starter motor pinion gear with V.C.I. Grease.

15.0. **EXHAUST SYSTEM**

15.1. Spray Exhaust Pipe with V.C.I. Oil Additives.

15.2. Coat external exhaust pipe with VCI Rust Converter.

15.3. Seal exhaust opening with V.C.I. Film , security label and Aluminum Foil Tape.

16.0. **CREW CABIN**

16.1. Apply Silicon Fluid to all rubber and plastic parts. Install V.C.I. Foam Emitter near to instrument.

17.0. **Tracks**

17.1. Apply VCI Silicone fluid to all rubber pads, and apply VCI wax on all track links.

18.0. FOURTH STAGE: SEALING OF VEHICLE

18.1. Seal the openings (between cabin and crew compartment) with V.C.I. Film and Aluminium Foil Tape. Place security seal at all openings.

18.2. If the vehicle is to be preserved outdoor or without shelter, cover with VCI canopy.

19.0. ROUTINE INSPECTION DURING STORAGE AT 1 YEAR POINT

19.1. **External Chassis**

19.1.1. Inspect the conditions of enclosure. Carry out sealing on the enclosure if required. Inspect hinges and re-oil if necessary.

19.2. **Internal Chassis**

19.2.1. If inspection is required for crew compartment, break security seals and enter vehicle. Open all doors and ventilate for at least 5 minutes before entering so that fresh air can circulate through the cabin.

19.2.2. Inspect interior of vehicle for signs of deterioration, and carry out necessary maintenance works if required. Special attention must be given to check the floor board for water condensation. Drain condensate if necessary.

19.2.3. Inspect every rubber seal and treat them with VCI Silicon Fluid if necessary.

19.2.4. Replace V.C.I. at every 2nd annual inspection, - alternatively after 24 months if vehicle has not been opened for interior inspection.

- 19.2.5. After body interior has been inspected and re-preservation completed, ensure that all the openings are properly (re)sealed with security label seal.

20.0. RE-PRESERVATION OF ARMoured VEHICLE AFTER MOBILIZATION

20.1. General

- 20.1.1. All equipment should be cleaned and dried, followed by inspection before re-applying of V.C.I. products. Water trapped in the vehicle should be removed.

20.2. Static Mobilization

- 20.2.1. If it is just only static mobilization i.e. only to start the engine for less than half an hour, then re-application of new V.C.I. products is not necessary. You may recycle the existing used V.C.I. products. However, it is of paramount importance to seal all opened openings with new sealing tapes and security label seal.

20.3. Moving / Open Mobilization

- 20.3.1. If the vehicle is mobilized for few days, please repeat procedures 1, 2, 6, 7, 12, 13, 14, 15 and 16

Example 2:

The Details of VCI Preservation Methodology of Main Battle Tank is herein described;

1.0 FIRST STAGE: ZERO POINT

- 1.1 Zero Point involves the changing of engine oil, oil filters, steering oil, engine transmission oil, hydraulic fluids, fuel, and fuel filter.

2.0. SECOND STAGE: PREPARATION OF VEHICLE

- 2.1. Open hull service plate to drain out contaminant, if any.
- 2.2. Clean the interior and exterior of Main Battle Tank with water based V.C.I. degreaser/cleaner and cover all optics with VCI P.E. film together with Silica Gel.
- 2.3. Treat all existing corroded parts with VCI Rust converter Primer.
- 2.4. Grease door hinges, hatch hinges, clips and all moving parts with V.C.I. Grease.

3.0 THIRD STAGE: APPLICATION OF VCI PRODUCTS ON THE ESSENTIAL SYSTEM OF THE MAIN BATTLE TANK

3.1. ENGINE

- 3.1.1 Open engine compartment covers for access to the engine.
Drain out lubricating oil, refill with 90% of new oil and 10% of V.C.I. Oil Additive via Filler Cap.

3.2 TRANSMISSION (AUTOMATIC) AND HYDRAULIC SYSTEMS

- 3.2.1 Drain out hydraulic fluid and refill with new fluid and add 5% of VCI Hydraulic Oil Additives.
- 3.2.2 Add 5% of VCI Hydraulic Oil Additives to all hydraulic system.

4. DIFFERENTIAL AND TRANSFER CASE

- 4.1. Drain out lubricating oil, refill with 90% of new oil and 10% of V.C.I. Oil Additive via Differential and Transfer Case Filler Cap.

5. FINAL DRIVES

- 5.1. Open front mud-guard side service plate and remove oil plug and drain out lubricating oil. Refill with 90% of new oil and 10% of V.C.I. Oil Additive via Final Drive Housing Filler Plug.

6. COOLING FAN AND GEARBOX

- 6.1. Drain out lubricating oil, refill with 90% of new oil and 10% of V.C.I. Oil Additives via Filler Plug.

7. RAMP DOOR HYDRAULIC SYSTEM

- 7.1. Drain out hydraulic fluid and refill with new fluid and add 5% VCI Hydraulic Additives.
- 7.2. Apply a thin layer of V.C.I. Grease on the hydraulic cylinder exposed piston rod, steel cable and roller.

8. FUEL SYSTEM

- 8.1. Top up VCI Fuel and add 1% of VCI Fuel additives into the fuel tank.
- 8.2. Start engine and run at idling speed for 5 minutes (650 rpm - 750 rpm or up to normal operating temperature)

- 8.3. Step-up speed to 1500 rpm for 30 seconds.
- 8.4. Step-up to maximum speed (2900 rpm) - full throttle for 30 seconds.
- 8.5. Leave fuel lines filled with fuel fortified with VCI Fuel Additives. Do not remove fuel.
- 9. COOLING SYSTEM
 - 9.1. Add 5% of VCI Radiator Coolant Additives to the radiator and top up with water.
 - 9.2. Drain out Fan Gearbox lubricating oil, refill with 90% of new oil and 10% of V.C.I. Oil Additives via Filler Plug.
 - 9.3. Apply VCI silicone Fluid on the water hoses.
- 10. SUSPENSION SYSTEM
 - 10.1. Tensioners and Idler Wheels
 - 10.1.1. Grease the tensioners and idler wheels with V.C.I. Grease via all grease nipples.
 - 10.2. Support Rollers
 - 10.2.1. Grease all support roller bearings with V.C.I. Grease via all grease nipples.
 - 10.2.2. Apply Silicone Fluid onto all rubber parts.
 - 10.3. Road Wheels
 - 10.3.1. Grease all road wheel bearings with V.C.I. Grease via all grease nipples.
 - 10.3.2. Apply VCI Silicone Fluid to all rubber parts.
- 11. STEERING SYSTEM
 - 11.1. Grease all steering linkages and pivot points with V.C.I. Grease.
- 12. PROPELLER SHAFTS AND UNIVERSAL JOINTS
 - 12.1. Grease the propeller shafts and universal joints with V.C.I. Grease via all grease nipples.
- 13. EXHAUST SYSTEM
 - 13.1. Spray Exhaust Pipe with V.C.I. Oil Additive into the exhaust pipe.

- 13.2. Seal exhaust opening with V.C.I. Film and Aluminum Foil Tape.

- 14. AIR INLET
 - 14.1. Spray with V.C.I. Oil Additive and seal with Aluminum Foil Tape.

- 15. BRAKE SYSTEM
 - 15.1. Parking brake - Do not engage. Grease all linkages and pivot points with V.C.I. Grease.

- 16. VEHICLE ROAD TEST
 - 16.1. Close engine cover and service plates before testing vehicle.
 - 16.2. Test drive - drive vehicle for 200 meter and check for leaks.

- 17. ELECTRICAL SYSTEM
 - 17.1. Master Switch Panel
 - 17.1.1. Remove screws from master switch panel; spray all contact points and circuitry with V.C.I. Electro Spray. Install V.C.I. Foam Emitter and close the master switch panel.
 - 17.2. Instrument Panel
 - 17.2.1. Install V.C.I. Foam Emitter behind the instrument panel.
 - 17.3. Slave Receptacle
 - 17.3.1. Coat slave receptacle with V.C.I. Wax.
 - 17.4. Battery
 - 17.4.1. Remove cable connection point from battery and coat with V.C.I. Wax. Return battery to authority for maintenance.
 - 17.5. Elevation Gear Transmission
 - 17.5.1. Apply generously VCI Grease on the pinion of the gear transmission.
 - 17.5.2. Spray VCI Electro Spray into the electrical motor.
 - 17.6. Starter Motor
 - 17.6.1. Apply generously VCI Grease on the pinion of the starter motor.
 - 17.6.2. Spray VCI Electro Spray into the electrical motor.

- 18. ALTERNATOR AND FAN BELTS
 - 18.1. Apply VCI Silicone Fluid onto all belts.
- 19. TRACKS
 - 19.1. Apply VCI Silicon Fluid onto all rubber parts.
 - 19.2. Coat the tracks with V.C.I. Wax.
- 20. CUPOLA SUB-SYSTEMS AND SUB-ASSEMBLIES
 - 20.1. Control Panel
 - 20.1.1. Remove cover from control panel and spray VCI Electro Spray on all electrical connectors and electrical joints.
 - 20.1.2. Install VCI Foam Emitter in the panel box before installing the cover.
 - 20.2. Smoke Grenade Launcher
 - 20.2.1. Spray VCI Electro spray into the internal portion of launcher.
 - 20.3. Cupola Hatch
 - 20.3.1. Lubricate all moving parts and joints with VCI Grease.
 - 20.4. Admin Lock
 - 20.4.1. Apply a coat of VCI Wax on the Admin Lock.
 - 20.5. Slew Ring
 - 20.5.1. Lubricate all moving parts and gear teeth with VCI Grease.
 - 20.6. Bracketeries
 - 20.6.1. Apply a coat of VCI Wax over Cupola basket and Cupola shield assembly.
- 21. TRUNNION ASSEMBLIES (LEFT, RIGHT)
 - 21.1. Lubricate grease nipples and moving parts with VCI Grease.
 - 21.2. Spray connector pin with VCI Electro Spray.
- 22. SEAT / STANDING PLATFORM
 - 22.1. Lubricate all joints and movable parts with VCI Grease.
- 23. FRONT SUPPORT AND BODY CRADLE ASSEMBLY AND ELEVATION SYSTEM

- 23.1. Elevation Mechanism Assembly
 - 23.1.1. Lubricate elevation cranking handle, all moving parts and joints with VCI Grease
- 23.2. Elevation Spring Tensioner
 - 23.2.1. Coat with VCI Wax.
- 23.3. BORESIGHT And REAR BORESIGHT ASSEMBLY
 - 23.3.1. Lubricate all joints with VCI Grease.
- 24. AMMO BOX HOLDER
 - 24.1. Lubricate all hinges, joints and movable parts with VCI Grease.
- 25. CUPOLA CONTROL SYSTEM
 - 25.1. Control Handle
 - 25.1.1. Spray VCI Electro spray on the activation lever, switch and all firm switches.
 - 25.2. Control Box Assembly
 - 25.2.1. Remove cover and install 1VCI Foam Emitter in the box assembly. Spray all connectors with VCI Electro Spray.
 - 25.3. Wire Junction Box
 - 25.3.1. Remove cover and install 1 VCI Foam Emitter and Spray all connectors and cable joints with VCI Electro spray.
- 26. PERISCOPES
 - 26.1. Spray a layer of VCI Biocide on Lenses and cover it with VCI P.E. Film.
- 27. INTERCOM JUNCTION BOX
 - 27.1. Remove cover and install 1Piece of VCI Foam Emitter and spray all connectors and cable joints with VCI Electro Spray.
- 28. TRAVERSE GEARBOX
 - 28.1. Lubricate all moving parts with VCI Grease. Spray all connectors and cable joints with VCI Electro Spay.
- 29. AGL AND MG SOLENOID ASSEMBLY
 - 29.1. Spray all electrical contact points and cable joints with VCI Electro Spray.

- 29.2. Lubricate all movable parts with VCI Grease.
- 30. **GUN BARREL, BRIDGE BLOCK MECHANISM, TURRET AND SMOKE GRENADE LAUNCHER.**
 - 30.1. Gun Barrel applicable to 105, 155 and 240 mm Barrel
 - 30.2. Grease the barrel with V.C.I. Grease or coat it VCI Wax and close muzzle brake cover.
 - 30.3 Bridge .Block
 - 30.3.1 Cock and spray with V.C.I. Oil Additive or coat with VCI grease.
 - 30.4. Turret
 - 30.4.1 Loading drum mechanism - spray with V.C.I. Oil Additives.
 - 30.5. Coat all moving parts with V.C.I. Grease, for example transversing gear box.
 - 30.5.1 Spray the firing mechanism with V.C.I. Oil Additive.
 - 30.6. Spray smoke grenade launcher with V.C.I. Electro Spray
 - 30.7. Check hydraulic system for leaks.
 - 30.8. Bull Ring And Ring Gear
 - 30.8.1 Grease bull ring and ring gear with V.C.I. Grease.
- 31.0. **GPMG EXTENSION ARM (IF APPLICABLE)**
 - 31.1. Spray GPMG extension arm mechanism with Vapro 850 V.C.I. Oil Additive.
- 32.0. **CUPOLA AND HATCHES (IF APPLICABLE)**
 - 32.1. Grease the ring gear with V.C.I. Grease.
- 33.0. **DRIVER / CREW COMPARTMENT**
 - 33.1. Install V.C.I. Foam Emitter and VCI Pouches in the crew compartment.
- 34.0. FOURTH STAGE: SEALING OF VEHICLE**
 - 34.1. Seal all openings with Aluminum Foil Tape and place security seal at all openings.
 - 34.2. If the vehicle is to be preserved outdoor or without shelter, cover with canopy.
- 35.0. ROUTINE INSPECTION DURING STORAGE AT 1 YEAR POINT**
 - 35.1. External Chassis

- 35.1.1. Inspect the conditions of enclosure. Carry out sealing on the enclosure if required. Inspect hinges and re-oil if necessary.
- 35.2. Internal Chassis
 - 35.2.1. If inspection is required for crew compartment, break security seals and enter vehicle. Open all hatches and doors to ventilate for at least 10 minutes before entering so that fresh air can circulate through the cabin.
 - 35.2.2. Inspect interior of vehicle for signs of deterioration, and carry out necessary maintenance works if required. Special attention must be given to check the floor board for water condensation. Drain condensate if necessary.
 - 35.2.3. Inspect every rubber seal and treat them with VCI Silicone Fluid. if necessary.
 - 35.2.4. Replace V.C.I. Products at every 2nd annual inspection, - alternatively after 24 months if vehicle has not been opened for interior inspection.
 - 35.2.5. After body interior has been inspected and re-preservation completed, ensure that all the openings are properly (re)sealed with security label seal.

36.0. RE-PRESERVATION OF MAIN BATTLE TANK AFTER MOBILIZATION.

- 36.1. General
 - 36.1.1. All equipment should be cleaned and dried, followed by inspection before re-applying of V.C.I. products. Water trapped in the vehicle should be removed.
- 36.2.0 Static Mobilization
 - 36.2.1. If it is just only static mobilization i.e. only to start the engine for less than half an hour, then re-application of new V.C.I. products is not necessary. You may recycle the existing used V.C.I. products. However, it is of paramount importance to seal all opened openings with new sealing tapes and security label seal.
- 36.3.0 Moving / Open Mobilization
 - 36.3.1 If the vehicle is mobilized for few days, please repeat procedures 1, 2, 6, 7, 8, 10, 11, 12, 14, 15, 16, 17 and 18.

Example 3:

The details VCI preservation of Soft-Skin Transport Vehicle is herein described;

1.0 FIRST STAGE: ZERO POINT

- 1.1 Zero Point involves the changing of engine oil, oil filters, steering oil, engine transmission oil, hydraulic fluids, fuel, and fuel filter.

2.0 SECOND STAGE: PREPARATION OF VEHICLE

- 2.1. Clean the interior and exterior of Transport Vehicle with V.C.I. Water Based Degreaser.
- 2.2. Treat all existing corroded parts with V.C.I Rust Converter Primer.
- 2.3. Grease door hinges and all moving parts with V.C.I. Grease.

3.0 THIRD STAGE: APPLICATION OF V.C.I. PRODUCTS

3.1. ENGINE

- 3.1.1. Drain out lubricating oil, refill with 90% of new oil and 10% of V.C.I. Oil Additives via Filler Cap.

3.2. TRANSMISSION & TRANSFER CASE

- 3.2.1. Drain out lubricating oil, refill with 90% of new oil and 10% of V.C.I. Oil Additive via Transmission and Transfer Case Filler Plug.

4.0. DIFFERENTIAL FRONT AND REAR

- 4.1. Drain out lubricating oil, refill with 90% of new oil and 10% of V.C.I. Oil Additive via Differential Filler Plug.

5.0. SWIVEL HOUSING LEFT AND RIGHT

- 5.1. Drain out lubricating oil, refill with 90% of new oil and 10% of V.C.I. Oil Additives via Swivel Housing Filler Plug.

6.0. FUEL SYSTEM

- 6.1. Top up Fuel and add 1% of VCI Fuel Additives into the fuel tank.
- 6.2. Run engine for 3-5 minutes at idling speed. A few times during the period, speed up engine to top speed.
- 6.3. Leave fuel lines filled with fuel fortified with V.C.I. Fuel Additives. Do not remove fuel.

- 6.4. Apply V.C.I. Silicone Fluid onto the fuel hoses.
- 7.0. COOLING SYSTEM
- 7.1. Drain out coolant, refill with 95% of new coolant and 5% of VCI Coolant Additives.
- 7.2. Apply V.C.I. Silicone Fluid onto the water hoses.
- 8.0. PROPELLER SHAFTS (if applicable)
- 8.1. Grease propeller shaft universal joints and sliding joints with V.C.I. Grease via all grease nipples.
- 9.0. POWER STEERING
- 9.1. Drain out hydraulic fluid; refill with new fluid and add 5% of VCI Hydraulic Additives into the power steering system.
- 9.2. Apply V.C.I. Silicone Fluid onto the hydraulic hoses.
- 10.0. BRAKE SYSTEM
- 10.1. Grease brake shoe adjuster, pivot points and all brake linkages with V.C.I. Grease.
- 10.2. Apply V.C.I. Silicone Fluid on the brake hoses.
- 11.0. CLUTCH SYSTEM
- 11.1. Depress clutch paddle and insert wooden block into clutch lever.
- 11.2. Spray V.C.I. Powder into the clutch chamber.
- 12.0. VEHICLE ROAD TEST
- 12.1. Start engine, drive for 1 km and check for leaks.
- 13.0. ELECTRICAL SYSTEM
- 13.1. Relay Box
- 13.1.1 Spray all connectors in the relay box with V.C.I. Electro Spray and install V.C.I. Foam Emitter. Spray starter motor solenoid contact point with V.C.I. Electro Spray.
- 13.2. Power Distribution Box
- 13.2.1 Spray all connectors contact point with V.C.I. Electro Spray and install V.C.I. Foam Emitter.
- 13.3. Connectors

13.3.1 Spray all connectors with V.C.I. Electro Spray and install V.C.I. Foam Emitter.

13.4. Slave Receptacle

13.4.1 Coat slave receptacle with V.C.I. Wax.

13.5. Battery Terminal

13.5.1 Remove cable connection point from battery and coat with V.C.I. Wax. Return battery to authority for maintenance.

13.6. Starter Motor

13.6.1 Lubricate starter motor pinion gear with V.C.I. Grease.

14.0. EXHAUST SYSTEM

14.1. Spray Exhaust Pipe with Oil Additive into the exhaust pipe.

14.2. Coat external exhaust pipe with V.C.I. Graphite Heat Resistant Coating

14.3. Seal exhaust opening with V.C.I. Film and Aluminum Foil Tape.

15.0. CREW CABIN

15.1. Apply Silicone Fluid onto all rubber and plastic parts. Install V.C.I. Foam Emitter and Pouches near to instrument.

16.0. TYRES

16.1. Apply V.C.I. silicone Fluid to all tyres.

Note : Tyres are to be rotated a quarter turn every half yearly.

17. STAGE FOUR: SEALING OF VEHICLE

17.1. Seal the openings (between cabin and crew compartment) with V.C.I. Film and Aluminium Foil Tape. Place security seal at all openings.

17.2. If the vehicle is to be preserved outdoor or without shelter, cover with canopy.

18.0. ROUTINE INSPECTION DURING STORAGE AT 1 YEAR POINT

18.1. External Chassis

18.1.1 Inspect the conditions of enclosure. Carry out sealing on the enclosure if required. Inspect hinges and re-oil if necessary.

18.2. Internal Chassis

- 18.2.1 If inspection is required for crew compartment, break security seals and enter vehicle. Open all doors and ventilate for at least 5 minutes before entering so that fresh air can circulate through the cabin.
- 18.2.2 Inspect interior of vehicle for signs of deterioration, and carry out necessary maintenance works if required. Special attention must be given to check the floor board for water condensation. Drain condensate if necessary.
- 18.2.3 Inspect every rubber seal and treat them with V.C.I Silicone Fluid if necessary.
- 18.2.4 Replace V.C.I. at every 2nd annual inspection, - alternatively after 24 months if vehicle has not been opened for interior inspection.
- 18.2.5 After body interior has been inspected and re-preservation completed, ensure that all the openings are properly (re)sealed with security label seal.

19.0. RE-PRESERVATION OF HUMMER TRUCK AFTER MOBILIZATION

19.1. General

- 19.1.1 All equipment should be cleaned and dried, followed by inspection before re-applying of V.C.I. products. Water trapped in the vehicle should be removed.

20.2. Static Mobilization

- 20.2.1 If it is just only static mobilization i.e. only to start the engine for less than half an hour, then re-application of new V.C.I. products is not necessary. You may recycle the existing used V.C.I. products. However, it is of paramount importance to seal all opened openings with new sealing tapes and security label seal.

20.3. Moving / Open Mobilization

- 20.3.1 If the vehicle is mobilized for few days, please repeat procedures 1, 2, 6, 7, 12, 13, 14, 15 and 16

The foregoing embodiments are susceptible to considerable variation in its practice. Accordingly, the embodiments are not intended to be limited to the specific exemplifications set forth hereinabove. Rather, the foregoing embodiments are not within the spirit and scope of the appended claims, including the equivalents thereof available as matter of law.

The patentees do not intend to dedicate any disclosed embodiments to the public, and to the extent any disclosed modifications or alterations may not literally fall within the scope of the claims, they are considered to be part hereof under the doctrine of equivalents.

Claims:

What is claimed:

1. A VCI Preservation Methodology of armored Vehicles, battle tanks, transport vehicles, using VCI (vapor corrosion inhibitor) over cycles of two years.
2. The VCI Preservation Methodology of claim 1 wherein the preservation method the VCI products are used to maintain the operational readiness of the said vehicles by eliminating corrosion, prevents the deterioration of the electrical system, brake system, battery system, engine and transmission system, lubrication system, cooling system, clutch system, hydraulic system, weaponry system, exhaust system, steering system, optics, rubber and plastic parts.
3. The VCI Preservation Methodology of claim 1 wherein the preservation method involves four methodology stages, a routine annual inspection and mobilization, re-preservation at two year point. It starts with Zero Point, Preparation of Vehicle, Application of VCI Products on the essential systems of vehicle and sealing of vehicle.
4. The VCI Preservation Methodology of claim 3 wherein the Zero Point involves the changing of engine oil, oil filters, steering oil, engine transmission oil, hydraulic fluids, fuel, and fuel filter.
5. The VCI Preservation Methodology of claim 3 wherein the Preparation of Vehicle involves the cleaning the interior and exterior of the vehicle with VCI degreasing agent.
6. The VCI Preservation Methodology of claim 3 wherein the Preparation of the vehicle involves the treatment of any inherent rust of the vehicle with VCI rust converter.
7. The VCI Preservation Methodology of claim 6 wherein the inherent rust of the vehicle will be converted by the VCI rust converter from ferric hydroxide ($\text{Fe}(\text{OH})_3$) to ferrosferric oxide (Fe_3O_4) a stable compound which does not readily change as exposure conditions change.
8. The VCI Preservation Methodology of claim 3 wherein the application of VCI Products will be applied on the main operating systems of the vehicle, i.e. engine, differential and transfer case, steering system, engine, transmission & transfer case, final drives, swivel housing left and right, cooling system, fuel system, hydraulic system, exhaust system, optics, rubber components, electrical and electronic systems and connectors, weaponry system, suspension system, auxiliaries equipment, brake system, clutch system, turret system, driver and crew compartment and moving parts such joints.
9. The VCI Preservation Methodology of claim 3 wherein all openings, crevices and entrances of the vehicle will be hermetically sealed by foil tape and security label to prevent tempering and before a VCI Canvas Cover is place over the vehicle and kept for storage for two years.
10. The VCI Preservation Methodology of claim 8 wherein 10% by volume of VCI oil additives is added into the engine.

11. The VCI Preservation Methodology of claim 8 wherein 10% by volume of VCI oil additives is added into differential and transfer case.
12. The VCI Preservation Methodology of claim 8 wherein 10% by volume of VCI oil additives is added into steering system.
13. The VCI Preservation Methodology of claim 8 wherein 10% by volume of VCI oil additives is added into transmission and transfer case system.
14. The VCI Preservation Methodology of claim 8 wherein 10% by volume of VCI oil additives is added into the final drive system.
15. The VCI Preservation Methodology of claim 8 wherein 5% by volume of VCI coolant additives is added into the cooling system.
16. The VCI Preservation Methodology of claim 8 wherein 1% by volume of VCI fuel additive is added into the fuel system.
17. The VCI Preservation Methodology of claim 8 wherein 5% by volume of VCI hydraulic oil additives is added into the all the hydraulic system of the vehicle.
18. The VCI Preservation Methodology of claim 8 wherein VCI powder or VCI oil is spray into the exhaust system via the exhaust pipe before they are covered with VCI plastic film and then hermetically sealed.
19. The VCI Preservation Methodology of claim 8 wherein optics system is treated with VCI anti-mold spray.
20. The VCI Preservation Methodology of claim 8 wherein VCI silicon fluid is applied on all the rubber components, hoses, seals, tires and plastic parts of the vehicle to preserve them from deterioration caused by ozone and ultra violet rays.
21. The VCI Preservation Methodology of claim 8 wherein VCI electro-spray will be applied on all electrical contact points, battery terminal connectors, sockets, master switch panel, instrumental switch panel, slave receptical, printed circuit boards (PCBs) and the installation of VCI Foam Emitters in the electrical and electronic enclosures.
22. The VCI Preservation Methodology of claim 8 wherein VCI light oil or solvent is used to clean and preserve the weaponry system such as gun barrel.
23. The VCI Preservation Methodology of claim 8 wherein VCI grease is used to lubricate the weaponry system of the vehicle such as the cupola, trunnion assembly and ring gear.
24. The VCI Preservation Methodology of claim 8 wherein VCI grease is applied on the suspension system of the vehicle such as tensioners, the idler wheels, support rollers via the grease nipples.
25. The VCI Preservation Methodology of claim 8 wherein VCI grease is applied on the auxiliary's equipment of the vehicle such as the ram-door cable.

26. The VCI Preservation Methodology of claim 8 wherein VCI emitter pouches will be installed into the driver and crew compartment of the vehicle.

27. The VCI Preservation Methodology of claim 8 wherein the VCI grease is applied on all joints of the vehicle.

28. The VCI Preservation Methodology of claim 3 wherein a routine inspection of the vehicle will be carried out a 1 year point to ensure the 100% operational readiness condition of the preserved vehicle.

29. The VCI Preservation Methodology of claim 9 wherein all the openings, entrances and crevices of the vehicle will sealed by VCI fouling tape and security labels after the application of VCI products; and then covered by VCI Canvass Cover and will be placed in storage for two years.