SOW-00-837-2-09109A-2/1

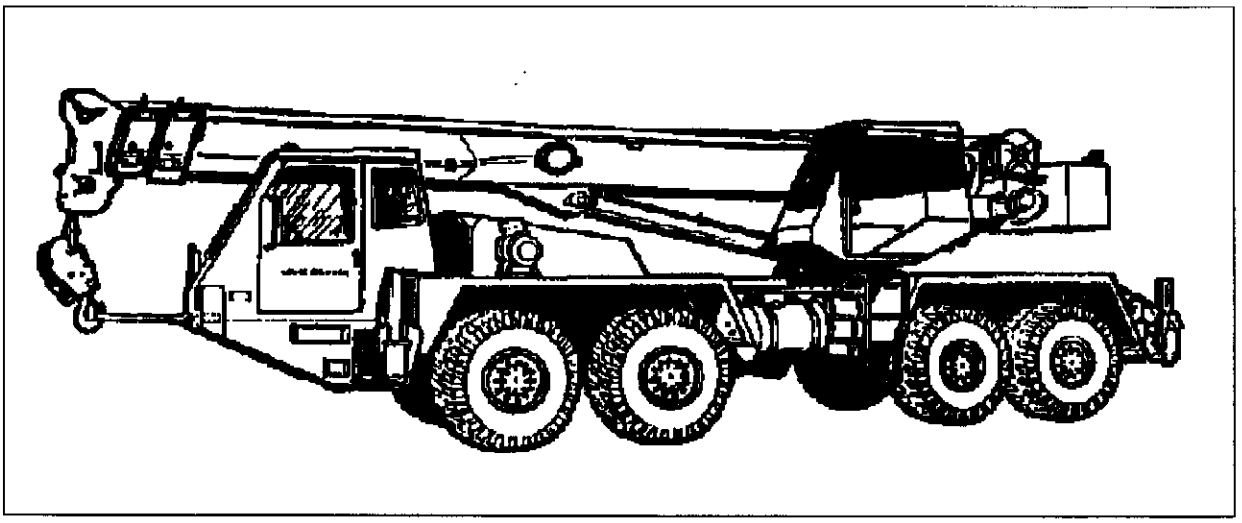
STATEMENT

OF

WORK

INSPECT AND REPAIR ONLY AS NECESSARY (IROAN)

CRANE, TRUCK MOUNTED
(HIGH SPEED, HIGH MOBILITY CRANE (HSHMC))



NSN 3810-01-268-1737
AND
NSN 3810-01-320-1920

EFFECTIVE DATE: 01 OCTOBER 1999

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Statement of Work
for the
High Speed, High Mobility Crane (HSHMC)
NSN 3810-01-268-1737 and NSN 3810-01-320-1920

1.0 **SCOPE.** This Statement of Work (SOW) establishes and sets forth tasks and identifies the work efforts that shall be performed by the Contractor. This document contains the minimum requirements to assemble, integrate, make fully operational, calibrate, install, test and inspect the Crane, Truck Mounted, NSN 3810-01-268-1737 and NSN 3810-01-320-1920, Weapon System Code Z3, to a serviceable condition (Condition Code "A".) Condition Code A is defined as Serviceable/Issuable without qualification, new, used, repaired or reconditioned material which is serviceable and issuable to all customers without limitation or restriction. This includes material with more than six months shelf-life remaining. The National Stock Numbers (NSNs) listed here shall be known as the HSHM Cranes. This SOW along with the HSHM Cranes Technical Manuals covers the minimum requirements applicable to the restoration of the HSHM Cranes. Additionally, The HSHM Cranes Technical Manuals sets forth guidelines within which the HSHM Cranes shall be refurbished, repaired and restored. The basic configuration of the HSHM Cranes is established by the HSHM Cranes Technical Manuals that are currently in the Marine Corps inventory. All materiel (including repair parts) shall be provided by the Contractor. Installation and testing shall be performed by the Contractor. All special tools and test equipment required to perform any task on the HSHM Cranes are listed in the HSHM Cranes Technical Manuals, and shall be provided by the Contractor.

Questions related to this SOW should be addressed to the HSHM Cranes Weapon System Manager, Life Cycle Management Center (Code 837-2), MARCORLOGBASES, Albany GA, Commercial Phone (912) 439-6533 or DSN 567-6533.

1.1 **Background**. IROAN is defined as: The maintenance technique which determines the minimum repairs necessary to restore equipment components or assemblies to prescribed maintenance serviceability standards by utilizing all available diagnostic equipment and test procedures in order to minimize disassembly and parts replacement.

1.2 **Item Identification**. The HSHM Crane NSN 3810-01-268-1737 is the basic crane. NSN 3810-01-320-1920 is the Pile Driver Crane and differs from the basic crane as follows:

a. This crane will accept Pile Driving Equipment.

b. The slewing ring upper frame allows attachment of the Piling Driver stabilization braces to this plate.

c. There is additional hydraulic system quick disconnect located on the winch control valve located on the main boom assembly.

d. The boom counter weight has been drilled and tapped to accept an auxiliary winch.

e. Boom counter weight work light has been relocated on counter weight. This SOW is applicable to both the Basic Crane and the Pile Driving Crane.

2.0 **Applicable Documents.** The following documents specified herein form a part of this SOW to the extent specified. In the event of conflict between the documents referenced herein and the contents of this SOW, the content of the SOW shall be the superseding requirement.

2.1 **Military Specifications**.

MIL-C-81309E	Corrosion Preventive Compounds, Water Displacing. Ultra-Thin Film

2.2 **Military Standards**.

MIL-STD-129	DoD Standard Practice for Military Marking
MIL-STD-130	DoD Standard Practice Identification Marking of U.S. Military Property,
MIL-STD-642	Identification Marking of Combat and Tactical Transport Vehicle

Military Standards (Guidance Only).

MIL-STD-973	Configuration Management

2.3 **Other Government Documents and Publications**. The issues of those documents cited below shall be used.

ATPD 2241	Vehicles, Wheeled: Preparation For Shipment and Storage of
DoD 4000.25-1-M	MILSTRIP Manual
NAVICPINST 4491.2A	Requisitioning of Contractor Furnished Material From The Federal Supply System
TM-4750-15/1	Painting and Registration Marking for Marine Corps Combat and Tactical Equipment.
TM 09109A-10/1	Operators Manual w/chgs 1 and 2, Revision 1, and Supplement 1
TM 09109A-24/2	Service Manual w/chgs 1, 2, 3, and Supplement 1.
TI 09109A-25/1	Hydraulic System Test Procedures F/HSHMC

SI 09109A-15/1	Repair Procedures For The Load Moment System Components Used On The High Speed, High Mobility Cranes.
SI 09109A-15/2	Hook Block Securing Procedures for High Speed, High Mobility Cranes
MI 09109A-35/1	Installation Of The Mechanical Boom Angle Indicator On High Speed, High Mobility Cranes.
MI 09109A-45/2	Installation Of Torsion Bar Reinforcement Plate/Repair Of Existing Mounting Plate For High Speed, High Mobility Crane.
SL-3 09109A/09109B	Components List For Crane, Truck Mounted.
SL-4 09109A	Repair Parts List For Crane, Rough Terrain, Heavy, Wheel Mounted.
TM 09109A-24/4	Simplified Test Equipment For Internal Combustion Engine Reprogrammable (STE/ICE-R).
MCO P11262.2	Inspection, Testing, and Certification of Tactical Ground Load Lifting Equipment.
TM 3080-34	Corrosion Prevention and Control

2.4 **Industry Documents.**

ANSI/ISO/ASQC Q9002-1994 Qualilty Systems

ISO 4021	Hydraulic Fluid Power Particular Contamination Analysis-Extraction of Fluid From Lines of an Operational System
NFPA B93.19M	Hydraulic Fluid Power Particular Contamination Analysis-Extraction of Fluid From Lines of an Operational System

Copies of Military Specifications and Standards are available from the Naval Publications and Forms Center, (ATTN: NPODS), 5801 Tabor Avenue, Philadelphia, PA 19120-5099. Copies of other government documents and publications required by contractors in connection with specific SOW requirements shall be obtained through the Contracting Officer: Commander, Attn: Contracting Officer (Code 891) Marine Corps Logistics Bases, 814 Radford Blvd., Albany, Georgia 31704-1128, commercial telephone number (912) 439-6761 or DSN 567- 6761. Copies of engineering drawings, if applicable, shall be obtained from Life Cycle Management Center, Attn: Code 825-3, 814 Radford Blvd. Suite 20320, Albany, Georgia 31704-0320, commercial telephone number (912) 439-6410 or DSN 567-6410.

3.0 **Requirements**

3.1 **General Tasks** In fulfilling the specified requirements, the Contractor shall render, yet shall not be limited to the following tasks:

a. Provide materials, labor, facilities, repair parts and services necessary to troubleshoot, test, diagnose, engineer, integrate, install, repair and calibrate as required to make fully operational the HSHM Cranes.

b. Conduct final-on-site testing for witness by the Weapon System Manager and/or their Representatives.

c. The Contractor shall be responsible for all structural, electrical and mechanical requirements associated with the repair and restoration of the HSHM Cranes.

3.2 **IROAN Objective and Functions** After IROAN, the HSHM Cranes shall have as a minimum the following characteristics:

a. Reliable as per system specifications. System specifications for the HSHM Cranes can be found throughout the HSHM Cranes Technical Manuals. These specifications are not always expressed in numbers but in some cases, specifications are expressed as an inspection. Specifications are listed with each assembly/subassemblies remove, inspect, and repair procedures in the Technical Manual that addresses the component being repaired or IROANed.

b. Maintainable

c. Serviceable (Condition Code "A")

d. Latest Marine Corps Configuration

e. All HSHM Cranes systems and components shall operate as designed intended

f. All HSHM Cranes shall have a Like New appearance.

3.3 **Specific Tasks** The following tasks describe the different phases for the IROAN of the HSHM Cranes.

Phase I Pre-Induction (Initial Inspection)
Phase II IROAN
Phase III Inspection, Testing and Acceptance
Phase IV Packaging, Handling, Storage and Transportation (PHS&T)

3.3.1 **Phase I Pre-Induction**

a. The Contractor shall inspect in detail HSHM Cranes transported to the Contractor for IROAN under provisions of this SOW. The Contractor shall ensure that the inspection is

sufficient to determine the condition of the inspected HSHM Cranes and the extent of work and repair parts required. The findings of this inspection shall be annotated on the HSHM Cranes Pre-Induction Checklist (Appendix A) and shall be maintained and made available upon request by the Weapon System Manager and/or their Representatives. The HSHM Cranes Initial Inspection Checklist may be duplicated in a electronic data base and maintained in that data base. If data is selected to be provided electronically to the Weapon System Manager and/or their Representatives, the Data base program must be agreed to by both the Contractor and the Weapon System Manager and/or their representative.

b. Test equipment shall be used to determine that assemblies and subassemblies meet prescribed reliability, performance, and work requirements. In those cases when conformance to the SOW cannot be certified through existing inspection and testing procedures and by use of diagnostic equipment, the assembly shall be removed, disassembled, inspected, tested and repaired to the degree necessary to assure full conformance with this SOW. HSHM Cranes will be operational tested 100 per cent in accordance with Section 4.1, Section 4.2, and provisions of this SOW.

c. Oil seals and gaskets leakage. Evidence of lubricating or hydraulic oils passing through or around a seal is in itself not a defect; however, consideration must be given to the fluid capacity in the item being checked/inspected. Inspection shall normally be performed during and immediately following an operational test, but not of sufficient duration to allow the fluids to return to ambient temperatures. The following shall be used as a guide in determine degree of oil loss:

(1) Class I - Seepage of fluid (indicated by wetness or discoloration) not great enough to form drops.

(2) Class II - Leakage of fluid great enough to form drops, but not enough to cause drops to fall from the item being checked/inspected.

(3) Class III - Leakage of fluid great enough to form drops that fall from the item being checked/inspected.

A CLASS I OR II LEAK, EXCEPT FUEL SYSTEM, BRAKE SYSTEM, AND POWER STEERING SYSTEMS IS AN ACCEPTABLE CONDITION AT ANY TIME AND DO NOT REQUIRE CORRECTIVE ACTION.

3.3.2 **Phase II - IROAN.** After pre-induction tests and inspections have been completed, IROAN of the HSHM Cranes shall be accomplished in accordance with this SOW and the HSHM Cranes Technical Manuals (Service and Parts Manuals). Deficiencies noted on the HSHM Crane Pre-Induction Checklist (Appendix A) during Phase I shall be repair/replaced. The following efforts shall be performed as part of the IROAN:

a. **Service and Parts Manual**: The Service and Parts Manuals listed below contains repair procedures and repair parts for the complete HSHM Cranes. The Trouble Shooting Guide

contained in these manuals are to be used along with the Pre-Induction Checklist in helping identify deficiencies with the HSHM Cranes. Repair procedures contained in these manuals are to be used to repair deficiencies identified on the Pre-Induction Checklist.

TM 09109A-10/1	Operators Manual w/chgs 1 and 2, Revision 1, and Supplement 1
TM 09109A-24/2	Service Manual w/chgs 1,2, and 3, and Supplement 1.
TI 09109A-25/1	Hydraulic System Test Procedures F/HSHMC
TI 09109A-25/2	Hook Block Securing Procedures for High Speed, High Mobility Cranes
SI 09109A-15/1	Repair Procedures For The Load Moment System Components Used On The High Speed, High Mobility Cranes.
MI 09109A-35/1	Installation Of The Mechanical Boom Angle Indicator On High Speed, High Mobility Cranes.
MI 09109A-45/2	Installation Of Torsion Bar Reinforcement Plate/Repair Of Existing Mounting Plate For High Speed, High Mobility Crane.
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SL-4 09109A	Repair Parts List For Crane, Rough Terrain, Heavy, Wheel Mounted.
TM 09109A-24/4	Simplified Test Equipment For Internal Combustion Engines Reprogrammable (STE/ICE-R).

The Service and Parts Manuals listed may contain provision for corrosion control, painting, and packaging. Provisions for corrosion control, painting. and packaging is provided within this SOW and shall be the superseding requirement.

b. **Detailed Mechanical Work**: HSHM Cranes received for IROAN shall be worked in accordance with the following paragraphs. All discrepancies noted on the IROAN Pre-Induction Checklist shall be repaired/replaced.

c. **HARDWARE**

(1) Replace broken, unserviceable and/or missing hardware, including nuts, bolts, screws, washers, turnlock fasteners, safety, and one time use items, etc., in accordance with the IROAN. Unserviceable would include any of the above that failed to function properly.

(2) Ensure proper hardware locking devices are present on all moving mechanical assemblies.

(3) Hardware normally supplied with commercial parts shall be used unless specifically prohibited.

(4) Hardware used in this IROAN shall be in accordance with existing technical publications.

d. **Engine Assembly, 3208 Caterpillar**

(1) TEST PROCEDURES. Prior to initial inspection, always make visual checks to assure normal operating conditions exist (fluid levels are correct, belt tension, etc.) Engine will not be removed from the HSHM Cranes unless major defects are found during the initial inspection, oil analysis and road testing. If repair is required, remove and repair per technical references in TM-09109A-24/2. Each engine assembly will be IROANed of all reported deficiencies. The engine will be detail cleaned and inspected for loose, damage, or missing parts. Special emphasis will be in place on mechanical noises which may identify internal engine damage. No unusual vibrations, excessive oil consumption, excessive exhaust smoke, leakage of exhaust gases, exhaust restrictions, loss of coolant, low engine oil pressure or engine overheating are permitted. If engine repair/rebuild is required, remove and repair per technical references shown in TM-09109A-24/2, Subsection 4B.

(2) PASS/FAIL. The engine shall be complete and contain no loose, damage, or missing parts. IROAN engines shall be free of all defects identified in the Engine Troubleshooting Guide found in TM-09109A-24/2, Table 4A-1. Engine oil filters are to be replaced 100 percent.

e. **Fuel System**

(1) Inspect fuel injectors lines and injectors to assure proper operations. Injector lines shall be securely mounted in their proper place. Leakage is not permitted. Lines shall contain no damage that may restrict fuel flow to the injectors or that may result in leakage after short use. Fuel injectors shall be tested as per TM 09109A-24/2, Subsection 4B. Injectors found to be faulty shall be replaced. Fuel line fittings shall not be rounded off or be in such a condition that will prevent them from being tightened to correct torque specifications. Fuel system test, repair, replace, and specification are found in TM 09109A-24/2, Subsection 4B.

(2) Inspect fuel injection pump and shutoff solenoid for proper operation. Check and adjust (if required) fuel injection pump timing in accordance with TM 09109A-24/2, Subsection 4B. Repair/Replace fuel injection pump and shutoff solenoid as required. Fuel pump, test, specification, and repair/replace procedures are found in TM 09109A-24/2, Subsection 4B.

(3) Replace fuel filters 100 percent. Inspect water separators and fuel priming pump for damage, leakage, and proper operation. Clean, repair, replace separators and priming pump as

needed. Inspect filter, water separator, and priming pump fuel lines for damage that may restrict fuel flow or that may result in leakage after short use. Fuel line fittings shall not be rounded off or be in such a condition that will prevent them from being tightened to correct torque specifications. Repair/replace procedures are found in TM 09109A-24/2, Subsection 4B.

(4) Inspect fuel tank for cracks or leakage. Repair as necessary. Inspect fuel tank screen for damage. Repair/replace as necessary. Inspect fuel sender unit for correct operation. Repair/Replace as needed.

(5) Inspect fuel supply lines, both metallic and nonmetallic, for cracks or damage that may restrict fuel flow or may result in leakage after short use. Fuel line fittings shall not be rounded off or be in such a condition that will prevent them from being tightened to correct torque specifications. Repair/replace as necessary. Repair/replace procedures can be found in TM 09109A-24/2, Subsection 4B.

(6) Inspect and test operation of the throttle control system for both lower and upper cab assemblies. Inspect and test operation of the throttle control valves and the air throttle cylinder assembly located on the engine. Repair/replace as required. Inspect system air lines and fittings. Air line fittings shall not be rounded off or be in such a condition that will prevent them from being tightened to correct torque specifications. Air lines shall not contain leakage or damage that may result in breakage after short use. Repair/replace as necessary.

f. **Engine Cooling System**

(1) Inspect and test cooling system by pressurizing the system 5 PSI above the pressure marked on the radiator pressure cap. Check all connections and hoses for the cooling system for leakage. Cooling System shall retain a pressure reading of 5 PSI above pressure marked on radiator cap for at least five minutes. Loss of coolant is not permitted under the provisions of this SOW.

(2) Inspect radiator for cracks, leaks, bent fins, and clogging that will prevent air flow through radiator. Clean, repair or replace radiator as required. Reverse flush, clean, and inspect radiator core 100 percent. Straighten bent fins that can be straightened.

(3) Inspect water inlet manifold, thermostat housing, and water pump for leakage. Inspect water pump assembly for unusual noise that may indicate that the pump bearings require replacement. Repair/replace as required. Repair/replacement procedures are found in TM 09109A-24/2, Subsection 4B.

(4) Inspect engine oil cooler for proper operation and leakage. Remove coil assembly, clean, inspect, and replace as required. Repair/replace procedures are found in TM 09109A-24/2, Subsection 4B.

(5) Inspect coolant heater pump assembly for proper operation and leakage. Coolant pump shall operate as intended. Repair/replace as required.

(6) Inspect fan assembly for breaks, bends, and missing rivets. Inspect fan assembly for missing bolts and washers. Repair/replace as required.

(7) Inspect fan shroud for breaks or cracks. Inspect fan shroud and guard for missing mounting hardware (nuts, bolts, washers, and brackets). Repair/replace as required.

(8) Inspect water pump drive assembly for damage. looseness, worn bearings, and correct function. Inspect mounting hardware for looseness, missing, or damage parts. Repair/ replace as required.

(9) Replace hose clamps that can not remain tight or can not be tightened. Replace coolant hoses 100 percent.

(10) Replace coolant. Antifreeze protection shall be to a temperature of -20 degrees Fahrenheit.

g. **Engine Accessories**

(1) COLD START ASSEMBLY.

Inspect and test the cold start assembly. Clean all components with suitable cleaning solvent. Inspect all tubes, electrical wires, and components for damage and wear. Cold Start Kit shall function as intended. Cold Start Kit shall be IROANed of all deficiencies annotated on the Pre-Induction Checklist.

(2) AIR CLEANER ASSEMBLY.

Inspect air cleaner assembly for corrosion, damage and leakage. Inspect the air cleaner indicator for proper function. Repair/replace air cleaner assembly/components as required. Replace air filters 100 percent.

(3) ALTERNATOR.

Alternator shall meet alternator test checks identified in STE/ICE-R TM 09109A-24/2. Repair/replace alternator as required.
Replace alternator drive belts 100 percent. Assure belt tension is set at belt tension gauge reading of 120 plus/minus 5. Replace alternator drive pulley if damaged.

(4) ENGINE STARTER.

Engine Starter and starter solenoid shall meet starter/solenoid test checks identified in STE/ICE-R TM 09109A-24/2. Repair/replace starter and/or starter solenoid as required.

h. **Vehicle Electrical System**.

The HSHM Cranes consist of a lower and upper cab assemblies. Both cabs contain gauges, meters, windshield wiper assemblies, switches, and other various electrical components. Both cabs components shall be inspected, operational tested, repaired or replaced as required. The inspect procedures will not identify lower or upper cab unless a component is located only in that cab.

Inspect all wiring harnesses, battery cables for corrosion, bent or missing pins, and ripped or torn insulation and tie wraps. Repair/replace all missing and bent pins. Repair of insulation less than four inches in length may be accomplished using electrical tape. Tears or rips in excess of four inches shall require installation of new conduit. Corrosion shall be removed from components. Upon removal of corrosion, if component does not function properly, replace component. Replace all damaged battery cables. Replace any missing or damaged tie wraps.

The following electrical systems shall be inspected and tested for proper operation..

(1) Inspect electrical panel gauges and meters for proper operation. Replace any electrical gauge or switch that does not function properly after assuring that the sending unit is not defective. Replace hour meters if nonfunctional.

(2) Inspect instrument panel warning lights. Replace warning lights that are not operational. Test warning light activation devices to assure they function correctly. Repair/replace as required.

(3) Inspect slaving receptacle for proper operation. Repair/replace as required..

(4) Inspect and test operate all switches, fuses and circuit breakers. Replace electrical switches that do not operate as intended. Replace all relays, fuses, and circuit breakers that are not functioning properly or are blown out.

(5) Inspect all wiring harnesses. Replace any wiring that is frayed or broken. Electrical wiring with deteriorated or defective insulation shall be repair/replaced as required. Repair by splicing is acceptable when the wire use to make the splice is the same wire size and color. The wire splice joint shall be soldered and covered by heat shrinkable electrical insulation tubing shrunk to finished wire size and extending one inch beyond each side of the spliced joint.

(6) Inspect and operational test windshield wiper assemblies. Inspect and operational test windshield wiper and washer assemblies for proper operation. System shall operate as intended. Adjust blade park to specifications. Replace wiper blades 100 percent.

(7) Vehicle batteries shall be replaced 100 percent with wet, fully charged batteries. All battery to ground cable/straps shall be replaced. Battery clamps shall be clean and securely fastened to battery post. No cracks are allowed. Battery box shall be free of corrosion and

damage. Clean and repair as needed. Battery hold down devices shall operate as intended. Repair/replace as required.

(8) Inspect the headlights, blackout lights, turn signals, rear composite lights, flood lights, reflectors, and instrument panel lights for cracks, corrosion, moisture, broken and blown bulbs. Replace any headlights, blackout lights, turn signals, flood lights, side marker lights reflectors, and instrument panel lights that are blown out or broken.

(9) Inspect and operational test defrost fan assemblies. Inspect, clean, and/or replace fan blades and guards as required. Inspect fan motor for proper operation. Motors shall operate as intended without overheating or locking up. Replace motor as required.

(10) Inspect Collector Ring Assembly. Inspect and clean slip rings and brush holders. Inspect brushes for wear. Replace as needed. Collector Ring Assembly shall operate as intended.

i. **Carrier Transmission and Torque Converter**.

Inspect metallic and nonmetallic hydraulic lines and hoses for damage that may resist flow or may result in rupture. Check hose and line fittings to assure they are tight and do not leak. Replace lines, hoses and fittings that are rounded off and can not be tightened. Replace transmission filter 100 percent. Operational test transmission. Transmission shall operate as intended without overheating or slippage. Inspect transmission housing for cracks. Repair transmission as required.

Inspect and operational test lower and upper cab transmission shift lever assemblies, transmission electrically controlled shift control valve assembly, and wiring harness for proper operation. Repair/replace components as required. Repair wiring harness in accordance with Section 3.3.2, Paragraph H, Subparagraph 5.

Inspect torque converter for loose hardware (bolts and washers). Inspect torque converter for damage and wear that will prevent correct operation. Inspect input yoke for damage and excessive wear. Inspect yoke nut to assure proper torque is applied and nut is not loose. Remove/repair torque converter as required.

Inspect and test transmission oil cooler and hydraulic lines and hoses. Inspect metallic and nonmetallic hydraulic lines and hoses for damage that may resist flow or may result in rupture. Check hose and line fittings to assure they are tight and do not leak. Replace lines, hoses and fittings that are rounded off and can not be tightened. Replace all hydraulic hoses that contain damage that will result in failure. Inspect oil cooler for cracks, leaks, bent fins, and clogging that will prevent air flow through cooler. Clean, repair or replace oil cooler as required. Reverse flush, clean, and inspect oil cooler core 100 percent. Straighten bent fins that can be straightened.

Transmission and torque converter repair, replace, and specifications are found in TM 09109A-24/2, Subsection 4C.

j. **Drive Shafts**

Inspect universal joints for excessive wear or damage. Replace as needed. Inspect slip joint and drive shaft for cracks or damage. Repair/replace as required. Repair/replace procedures are found in TM 09109A-24/2, Subsection 4D.

k. **Axles.**

This vehicle is equipped with four axles: two drive-steer axles at the front, and two rigid drive axles at the rear. Both inner axles (number two and number three axles) use split torque differentials to provide drive power to the number one and number four axles.

(1) Front and Rear Axles. Operational test axles. Special emphasis will be in place on abnormal mechanical noises, vibrations, and overheating of the axles which may be an indicator of internal axle damage. Axles that demonstrates these conditions shall be removed, disassembled, inspected, and repaired as needed. Axles shall be free of structural damage and leakage. Axle oil shall contain no metal chips. If metal chips are found in the oil, remove, disassemble, inspect, and repair axles as needed. Axles shall operate as intended.

(2) Front Axles. Inspect steering pivot and spindle assemblies for corrosion, damage, leakage, smooth operation, and looseness. Axle steering components shall contain no corrosion or damage that may prevent proper operation and wheel alignment.
Repair/replace procedures are found in TM 09109A-24/2, Subsection 4E.

l. **Suspension**

Vehicle suspension system shall operate as intended. Suspension components are to be inspected for corrosion, leaks and damage that may prevent proper operation. Suspension components are:

(1) Torque Rods

(2) Suspension Cylinders

(3) Accumulators

(4) Suspension Lock Valves

(5) Pressure Reducing Valve

(6) Check Valves

(7) Hydraulic Hoses, Fittings, and Clamps

Repair/replace faulty suspension components as needed. Check accumulator nitrogen precharge. Charge shall be 440 plus/minus 40 psi at 70 degrees fahrenheit. Suspension shall be bled of all air and shall maintain a level position of the vehicle without a list to one side. Inspect hydraulic lines and hoses for damage that may resist flow or may result in rupture. Check hose and line fittings to assure they are tight and do not leak. Replace lines, hoses and fittings that are rounded off and can not be tightened. Replace hoses and lines that are damaged. Repair, replace, and suspension bleed procedures are found in TM 09109A-24/2, Subsection 4F.

m. **Hydraulic System**.

The HSHM Cranes hydraulic system is a system made up of pumps, motors, actuators, hoses, piping, a rotary joint (swivel), control valves, filters, reservoir and other components that are used to transfer power. HSHM Cranes hydraulic system shall inspected for and shall be free of any and all problems identified in the hydraulic trouble shooting guide. Hydraulic filters shall be replaced 100 percent. Inspect metallic and nonmetallic hydraulic lines and hoses for damage that may resist flow or may result in rupture. Replace hoses and lines as needed. Check hose and line fittings to assure they are tight and do not leak. Replace lines, hoses and fittings that are rounded off and can not be tightened.

NOTE

Hydraulic system shall be checked for contamination using ISO 4021 or NFPA B93.19M procedures prior to operational testing. If water is found in reservoir, drain a sufficient amount of hydraulic oil to remove any water which has settled in the reservoir. If complete system is contaminated, flush system using procedures found in TM 09109A-24/2 Subsection 5B, Paragraph 15 prior to operation.

Hydraulic hose, piping, filters, and fitting maintenance procedures are found in TM 09109A-24/2, Subsection 5B. Hydraulic pump troubling shooting guide, repair and replace procedures are in TM 09109A-24/2, Subsection 5C. Hydraulic swivel repair/replacement procedures are found in TM 09109A-24/2, Subsection 5D. Hydraulic system valve repair/ replacement procedures are found in TM 09109A-24/2, Subsection 5E.

n. **Boom Assembly**.

The boom assembly consist of five major components. These components are to be inspected, tested, repaired, or replaced as needed. These components are to be inspected using the Condition Inspection Record contained within MCO P11262.2 and inspection procedures identified in TM 09109A-24/2, Subsections 6A through 6F.

(1) Boom Assembly. Repair/replacement procedures are found in TM 09109A-24/2, Subsection 6B.

(2) Boom Hoist Cylinder. Repair/replacement procedures are found in TM 09109A-24/2, Subsection 6C.

(3) Boom Telescope Cylinders. Repair/replacement procedures are found in TM 09109A-24/2, Subsection 6D.

(4) Boom Hoist and Telescope Control Valves. Repair/replacement procedures are found in TM 09109A-24/2, Subsection 6E.

(5) Boom Adjustment and Alignment. Repair/replacement procedures are found in TM 09109A-24/2, Subsection 6F.

All components shall meet or exceed requirements of Condition Inspection Report contained within MCO P11262.2A.

o. **Load Hoist Winch Assembly**.

HSHM Cranes load hoist winch assembly shall be inspected for and shall be free of any and all problems identified in the Condition Inspection Record contained within MCO P11262.2A. The winch load hoist assembly contains the following subassemblies.

(1) Winch Motor. Winch motor shall be free of any and all problems identified in the winch motor troubleshooting guide. Repair/replacement procedures are found in TM 09109A-24/2, Subsection 7B.

(2) Hoist Winch. Hoist winch shall operate as intended. Repair/replace procedures are found in TM 09109A-24/2, Subsection 7C.

(3) Winch Control Valve. Winch control valve shall be free of any and all problems identified in the winch control valve troubleshooting guide. Repair/replacement procedures are found in TM 09109A-24/2, Subsection 7D.

(4) Hoist Winch Control Assembly. Winch control assembly shall function as intended. Assembly shall contain no missing, broken, loose components. Control Assembly shall function smoothly without binding up.

All components shall meet or exceed requirements of Condition Inspection Report contained within MCO P11262.2A.

p. **Swing System**.

HSHM Crane swing system shall be inspected for and shall be free of any and all problems identified in the Condition Inspection Record contained within MCO P11262.2A. The swing assembly contains the following subassemblies:

(1) Swing Motor. Swing motor shall be free of any and all problems identified in the swing motor troubleshooting guide. Repair/replacement procedures are found in TM 09109A-24/2, Subsection 8B.

(2) Swing Valves and Components. Swing valves and components shall be free of any and all problems identified in the swing valve and component troubleshooting guide. Repair/ replacement procedures are found in TM 09109A-24/2, Subsection 8C.

(3) Swing Reducer. Repair/replacement procedures are found in TM 09109A-24/2, Subsection 8D.

(4) Slewing Ring. Repair/replacement procedures are found in TM 09109A-24/2, Subsection 8E.

(5) Swing Control Assembly. Swing control assembly shall function as intended. Assembly shall contain no missing, broken, or loose components. Swing Assembly shall function smoothly without binding up.

All components shall meet or exceed requirements of Condition Inspection Report contained within MCO P11262.2A.

q. **Air System**.

HSHM Crane air system shall be inspected for and shall be free of any and all problems identified in the air system troubleshooting guide contained within TM 09109A-24/2, Subsection 9A. Air assembly contains the following subassemblies:

(1) Air Compressor. Air compressor shall be free of any and all problems identified in the air system troubleshooting guide. Air compressor air filter shall be replaced 100 percent. Repair/replacement procedures are found in TM 09109A-24/2, Subsection 9B.

(2) Air System Components. Air system components shall operate as intended. Air system components are governor, safety valve, air reservoirs, brake valve, dual brake valve, relay valve, spring brake valve, throttle control valves, throttle cylinder, and the parking brake control valve. These components are to be inspected, tested, adjusted, repaired, or replaced as per operational requirements contained in TM 09109A-24/2, Subsection 9C.

(3) Brake Chambers. Brake chambers shall operate as intended without binding or sticking. Brake chambers shall be inspected, tested, adjusted, repaired, or replaced as per operational requirements contained within TM 09109A-24/2, Subsection 9D.

r. **Vehicle Brake System**.

(1) Operational test vehicle brakes for proper operation. Remove vehicle wheels and remove brake drums for inspection. Replace drums that have cracks, severe heat checking, heat spotting, scoring, pitting or distortion. Original Equipment Manufacturer (OEM) does not recommend turning or reboring brake drums.

(2) Inspect spider or backing plate. All mounting bolts must be tight. Replace distorted spiders or backing plates.

(3) Repair or replace damaged or distorted dust shields.

(4) Inspect Actuator components. Plunger housing mounting bolts must be tightened to 30-40 lb-ft. Carefully inspect seals. Replace seals that are cut, torn or damaged in any way.

(5) Check the housing bores and the inner and outer diameters of the plungers for nicks, scratches or corrosion. Repair minor damage with crocus cloth. Replace plunger housing or the plunger when major damage is evident.

(6) Check the wedge ramps and all slots in the plungers for wear or damage. Replace as needed.

(7) Check the threads of the adjusting bolts and the actuator. Replace the parts when thread damage is evident. Replace the adjusting bolt when the detent spring is loose or damage.

(8) Check the pawl and actuator teeth for wear or damage. The pawl and actuator teeth must have sharp, undamaged edges with no displaced metal anywhere on the teeth. Replace the pawl assembly when the spring is weak or broken. Replace damaged or excessively worn parts.

(9) Inspect brake shoes and lining. Check the shoe retaining hardware for damage or wear. Replace as needed. Check the shoes for damage or distortion. The web must be straight and not twisted off line. The ends of the web that engages the plungers must not be flat or mushroomed. Check for cracks or broken welds between the web and table. Check for any cracks in the web or table. Replace linings worn past the minimum thickness indicated by the groove or scallops in the lining. Replace lining that is contaminated with oil or grease. OEM recommends and this SOW requires that the Contractor reline both wheels of a single axle when one side requires relining or complete brake shoe replacement. A maximum gap of 0.010 inch (0.25 mm) between the shoe and lining is acceptable.

s. **Power Steering System**

HSHM Cranes power steering system shall be operational tested from both the lower and upper cab assemblies. Wheel alignment, toe-in, and parallel wheel alignment shall be checked and adjusted to specifications as required. Check steering adjustment. Adjust steering to specifications as required. Specifications are found in TM 09109A-24/2, Subsection 10A. Power steering system contains the following subsystems. These subsystems are to be inspected, tested, repaired, or replaced as needed.

(1) Steering Column. Inspect and operational test steering column. Steering column shall be securely mounted in its proper place with no looseness of the steering wheel, steering shaft and tube bearings. Horn button, contact cup and spring shall operate as intended. Repair/ replacement procedures are found in TM 09109A-24/2, Subsection 10B.

(2) Right Angle Steering Gear. Inspect and operational test steering gear. Steering gear shall operate as intend without excess play. Inspect steering gear box yoke for damage and proper operation. Replace as needed. Repair/replacement procedures are found in TM 09109A-24/2, Subsection 10B.

(3) Power Steering Gear. Power steering gear shall be free of any and all problems identified in the power steering gear troubleshooting guide contained within TM 09109A-24/2, Subsection 10B.

(4) Steering Control Valve. Inspect and operational test steering control valve. Inspect for leakage and proper operation. Valve shall operate as intended. Repair/replacement procedures are found in TM 09109A-24/2, Subsection 10B.

(5) Steering Valves. These valves are the flow control valve, steering selector valve, and flow regulator. Inspect, test, repair, or replace valves as required. Assure steering selector valve switch located in the cabs are functional. Repair/replacement procedures are found in TM 09109A-24/2, Subsection 10C.

(6) Steering Cylinders. Inspect and operational test steering cylinders. Repair/rebuild leaking and damaged cylinders. Repair/replacement procedures are found in TM 09109A-24/2, Subsection 10D.

t. **Outrigger System**.

HSHM Crane outrigger system shall be free of any and all problems identified in the outrigger system troubleshooting guide contained within TM 09109A-24/2, Subsection 11A. Outrigger assembly contains the following subassemblies. These assemblies are to be inspected, tested, adjusted, repair, or replaced as per operational requirements identified in TM 09109A-24/2, Subsection 11A. Most of the valves are controlled by electrical switches located in the cab assemblies. Test these switches to assure they function correctly before testing these control valves.

(1) Extend/Retract Control Valve. Test valve for correct operation and leakage. Repair/ replace as required. Repair/replace procedures are found in TM 09109A-24/2, Subsection 11B.

(2) Outrigger Control Valve. Test valve for correct operation and leakage. Repair/ replace as required. Repair/replace procedures are found in TM 09109A-24/2, Subsection 11B.

(3) Relief Valve. Test valve for proper operation and leakage. Check pressure setting and adjust as needed. Replacement and adjustment procedure is found in TM 09109A-24/2, Subsection 11B.

(4) Outrigger Cylinders. Inspect and operation test outrigger vertical and horizontal cylinders for proper operation and leakage. Inspect cylinders for structural damage and bent shafts. Replace as needed. Operational test horizontal cylinder holding (lock) valves for proper

operation. Replace as required. Repair/replacement procedures are found in TM 09109A-24/2, Subsection 11C.

(5) Outrigger Pads and Pins. All HSHM Cranes placed in the repair cycle shall be provided with all outrigger pads and pins. HSHM Cranes shall be returned to the Marine Corps with all Pads and pins.

(6) Outrigger Beams. Outrigger beam shall meet requirements of the Condition Inspection Report contained within MCO P11262.2A.

All outrigger components shall meet or exceed requirements of Condition Inspection Report contained within MCO P11262.2A.

u. **Load Moment System (LMS)**.

HSHM Crane Load Moment System shall be free of any and all problems identified in the Load Moment System troubleshooting guide contained within TM 09109A-24/2, Supplement-1, Table 1. Load Moment System Assembly contains the following subassemblies. These assemblies are to be inspected, test, adjusted, repair, or replaced as per operational requirements identified in TM 09109A-24/2, Supplement 1.

(1) Cable Reel Assembly.

(2) Reel Control Wiring Harness

(3) Anti-Two Block Switch Assembly

(4) Hydraulic Pressure Transducers

(5) Computer Console Assembly.

The LMS shall be complete as per TM 09109A-24/2 and TM 09109A-24/2, Supplement-1. The LMS shall be operational test and shall function as intended without exception. The LMS computer shall contain the Generation III Erasable Programmable Read Only Memory (EPROM) chip. This chip is recognized by the blue dot affixed to the chip. LMS Computers that require repair/replacement shall be repaired or replaced in accordance with SI-09109A-15/1.

NOTE

The electronic components within the LMS Computer are Electrostatic Discharge Sensitive (EDS) items. Qualified EDS Technicians are required to verify EPROM type and replace EPROM if needed.

All Load Moment System components shall meet or exceed requirements of Condition Inspection Report contained within MCO P11262.2A.

v. **Upper and Lower Cab Assemblies**.

(1) Repair or replace damaged sheet metal panels, doors, covers, and other metal items as needed. Replace sheet metal panels where corrosion has penetrated panel. Repair or replace all worn or unserviceable door hardware including hinges, door strikes, handles, and door slides. Replace all glass damaged from staining, cracks, breakage, and pitting. Replace missing glass panels. Glass panels should be replaced with OEM supplied glass panel to assure factory specifications are maintained.

(2) Inspect and operational test windshield wiper and washer assemblies for proper operation. System shall operate as intended. Adjust blade park to specifications. Replace wiper blades 100 percent.

(3) Inspect, clean, and operational test defroster fan assembly. Defroster fan assemblies shall operate as intended.

(4) Inspect and operational test operator's seat and seat belt. Seat shall operate as intended. Replace seat backrest and seat cushion if torn.

(5) Inspect, clean and functionally test cab air conditioning/heater system. Repair deficiencies found during the testing. Inspect and clean blower impellers. Replace any impellers found damaged. Replace blower motors that overheat, bind up during operation, and contains bent output shafts.

WARNING
DANGEROUS CHEMICAL
The air conditioner system contains a refrigerant (R12) identified as an Ozone Depleting Substance. Handling of this refrigerant shall be in strict compliance with OSHA and DoD policies governing the use of this refrigerant in motor vehicles.

(6) Inspect lower cab rear view mirror assemblies for damage. Repair/replace as needed.

w. **Vehicle Sheet Metal Components**.

Repair or replace damaged sheet metal panels, covers, boom rest, skirts, fenders, ladders, bumpers and other metal items as needed. Replace sheet metal panels where corrosion has penetrated panel. Functional test tool box hinges, sliding hood slides, stationary hood latches and mirror hardware. Repair/replace as needed. Replace/repair all broken brackets and braces. Repairs shall be in accordance with best commercial practices.

x. **Rust Proofing and Painting (Exterior/Interior)**

All vehicles shall be rust proofed as required. Rust proofing shall be in accordance with following procedures.

(1) Clean area with either steam or high pressure water to remove dirt and loosen corrosion.

(2) Treat affected (corroded) areas with phosphoric fog.

(3) Clean in accordance to procedure 1.

(4) Apply MIL-C-81309 TYPE I, a water displacing corrosion inhibitor, to the affected areas.

(5) Prime and paint per latest edition of TM 4750-15/1.

Procedures for corrosion prevention and control are in accordance with TM 3080-34.

All exterior surfaces of the HSHM Cranes shall be painted with Chemical Agent Coating (CARC) paint. Paint color shall be Desert Sand or Green 383. Color of individual HSHM Cranes will be identified by the Weapon System Manager and/or their representative(s) upon induction into the IROAN cycle.

All HSHM Cranes cabs interiors shall be painted in the existing color. This paint shall be a lead and chromate free based paint .

y. **Data Plates and Decals**.

DATA PLATE. Each repaired HSHM Crane shall have an a IROAN data plate affixed next to the original vehicle data plate. The data plate shall meet the requirements of MIL-STD -130 and TM 09109A-24/2. Replace all data plates and decals that are missing and illegible. IROAN data plates shall be prepared by the Contractor and contain the following information:

VEHICLE SERIAL NO_____
REPAIRED IN ACCORDANCE WITH SOW 00-837-2-09109A-2/1.
CONTRACTOR_____
DATE_____
HOUR METER READING AT TIME OF REBUILD_____

NOTE: The HSHM Cranes contain hour meters in both the upper and lower cabs. Hour meter reading shall be taken from the hour meter with the most hours, if that hour meter is functional. Hour meters on vehicles rebuilt under provisions of this SOW shall not be turned back to zero.

RECORD JACKET: All major equipment or components serial numbers that are replaced during IROAN are to be identified by the Contractor to be recorded in the record jacket of the HSHM Cranes (This include engines, transmissions, etc.) Information will list the HSHM Cranes serial number, Name of equipment/component(s) replaced, serial number of deficiency equipment/component(s), serial number of replacement equipment/component(s), and if the equipment/component(s) is new or rebuilt.

3.3.3 **Phase III - Inspection, Testing and Acceptance.**

a. Inspection, testing and acceptance of the HSHM Cranes shall be conducted in accordance with TM 09109-24/2, MCO P11262.2A, and this SOW.

b. The Contractor shall be responsible for conducting required tests and shall ensure all necessary personnel are available to complete the final acceptance. Acceptance test shall be held at the Contractor's facility. Weapon System Manager and/or their representative(s) shall be given a minimum of two weeks notice piror to beginning acceptance testing. The test area shall be cleared of all equipment part, components, ect, not required for the test.

c. All HSHM Cranes IROANed under the provisions of this SOW shall be Load Tested and Condition Inspected as per MCO P11262.2A. A completed Condition Inspection Record and Load Test Certification shall be provided for insertion in the vehicle record jacket. A completed Condition Inspection Record and Load Test Certification shall be over packed with each vehicle. Condition Inspection Record can be found in MCO P11262.2A, Table 4-2, page 4-9 through 4-11. Vehicle Boom Assembly shall be stenciled with one inch letters and in a location that is readily visible when the boom is fully retracted, that the equipment has been Load Test Certified and the date certified. Stencil shall be in a lusterless black paint. Stencil sample: Load Tested 01 Jan 99.

d. The Contractor shall be responsible for correcting any deficiencies identified during inspection/testing. Weapon System Manager and/or their representative(s) may require the Contractor to report tests or portions thereof, if the original tests fail to demonstrate compliance with this SOW.

e. HSHM Cranes shall be lubricated and greased in accordance with the vehicle lubrication chart contained within TM 09109A-10/1, Section 3. All coolant and oil levels shall be full to proper levels.

f. Vehicle Markings. Registration numbers and other markings shall be applied in accordance with TM 4750-15/1 and MIL-STD 642. Lifting and tie down attachments shall be identified with one inch letters indicating "SLING POINT" or "TIE DOWN."

3.3.4 **Phase IV - Packaging, Handling, Storage and Transportation (PHS&T).**

a. The Contactor shall be responsible for preservation and packaging of items being repaired under the terms of this statement of work. Items being prepared for long term storage shall be Level A in accordance with ATPD-2241. Items scheduled for domestic shipment, immediate use, or shipment to overseas destinations with the exception of Maritime Prepositioned Forces (MPF), shall be preserved to Level B, Drive-on/ Drive-off. Items being prepared for overseas shipment shall have a label affixed which reads, "NOT FOR WEATHER DECK STOWAGE." Cranes scheduled for shipment to MPS shall be preserved to Level B, MPS Modified Drive Away.

b. The Terms Drive-on/Drive-off and MPF Modified Drive Away are defined as follows:

(1). Drive-on/Drive-off: Batteries will be hot and disconnected from vehicle electrical system. Terminals and leads will be taped. Fuel tank will be filled ¼ full. The air intake system, exhaust and brake systems, drive-train and gauges are to be depreserved.

(2). MPS Modified Drive Away: Batteries shall be hot and connected to vehicle electrical system. Fuel tank shall filled ¾ full of JP5. The air intake system, exhaust and brake systems, drive-train and gauges are to be depreserved. Fire extinguisher bracket and seats (all) shall be installed.

c. Marking shall be in accordance with MIL-STD-129.

d. The Marine Corps will provide the contractor with the shipping address(es) for delivery of the repaired equipment. The Contractor shall be responsible for arranging for shippment of the equipment to the pre-designed site(s). The Marine Corps will be responsible for transportation costs associated with shipping the subject equipment to and from the contractor.

3.4 **Configuration Management**

3.4.1 **Configuration Status Accounting (CSA)**

a. The Contractor shall determine the application status of approved configuration changes by visual inspections to the extent possible. The government will identify the configuration changes to be inspected by furnishing a Configuration Checklist (Appendix C) to the Contractor. The Contractor shall use one checklist for each HSHM Crane to record the inspection findings along with other required data.

b. The Contractor shall record serial numbers of the assemblies listed on the Configuration Checklist. The Contractor shall record the information on the same form that was used to record the application status of configuration changes.

3.4.2 **Configuration Control**. The Contractor shall apply configuration control to established baseline configuration item. Deviations from this established baseline configuration will not be allowed, without the written approval of the Weapon System/Equipment Manager (Code 837-2). If it is necessary to depart from the Authorized configuration, the Contractor shall prepare and submit a Request for Deviation or Request for Waiver. MIL-STD-973 (paragraphs 5.4.3 and 5.4.4 and appendix E) may be used as guidance.

3.5 **Government Furnished Equipment (GFE)Accountability/Government Furnished Materiel (GFM)**. GFE is government owned equipment authorized by contract for use by a commercial/government contractor. It is neither consumed during production nor incorporated into any product. GFM is materiel furnished to a contractor that will be consumed during the course of production or incorporated into product being manufactured/remanufactured under a contract/ statement of work. In the event the Marine Corps does have GFE/GFM requirements,

the Management Control Activity (MCA/G316-2), Marine Corps Logistics Bases, Albany, Georgia, will coordinate required GFE and will maintain a central control on Marine Corps assets in the Contractor's possession. The MCA will forward a GFE Accountability agreement to the Contractor Facility for signature to establish a chain of custody and property responsibilities for Marine Corps assets. The Contractor shall report receipt of all GFM and report consumption of GFM to the MCA.

3.6 **Contractor Furnished Materiel (CFM)**. The Marine Corps has adopted the Navy's procedures regarding Contractor Furnished Materiel (NAVICPINST 4491.2A). In the event that Contractor Furnished Materiel is required for repair parts, the contractor shall requisition through the DOD Supply System. DOD 4000.25-1-M, (MILSTRIP) Chapter 11 authorizes contractors to requisition through the DOD Supply System.

3.7 **Quality Assurance Provisions**

The performances of the Contractor and the quality of work delivered, material provided and documents written shall be subject to in-process review and inspection by the Weapon System Manager and/or their representative(s) during contract performance. Inspection may be accomplished at any work location. Authorized Weapon System Manager representative(s) shall be permitted to observe the work/task accomplishment or to conduct inspections at all reasonable hours within contractor normal working hours. Acceptance tests shall be held in-plant. Inspection by Weapon System Manager and/or their representative(s) of all acceptance tests plans, materials and associated lists furnished hereunder does not relieve the Contractor from any responsibility regarding defects or other failures to meet contract requirements which may be disclosed prior to final acceptance. The Contractor shall provide and maintain a Quality System that as a minimum, adheres to the requirements of ANSI/ISO/ASQC Q9002-1994 Quality System Model for Quality Assurance in Production, Installation, and Servicing. The Contractors work shall be subject to in-process reviews and inspections for compliance with Quality Systems by Weapon System Manager and/or their representative(s). Noncompliance with procedures resulting in degraded quality of work may result in a stop-work order requiring action by the Contractor to correct the work performed and to enforce compliance with quality assurance procedures or face contract termination. Notwithstanding such Weapon System Manager and/or their representative's inspection, it shall be the Contractor responsibility to ensure that the entire system meets the performance requirements delineated and addressed in the HSHM Cranes TM 09109A-24/2 and this SOW.

Quality assurance operations performed by the Contractor shall be subject to the Weapon System Manager and/or their representative(s) verification at any time. The Weapon System Manager and/or their representative(s) verifications can include, but shall not be limited in any matter, to the following:

a. Inspection of materials, products, assemblies, and documentation to assess compliance with quality standards.

b. Surveillance of operations to determine that quality assurance, practices, methods, and procedures are being properly applied.

c. Inspections of deliverable products to assure compliance with all requirements of the HSHM Cranes, this SOW, and applicable documents used herein.

d. Failure of the repair facility to promptly correct deficiencies discovered, shall be a reason for suspension of acceptance until corrective action has been made.

3.8 **Acceptance** - The performance of the Contractor and the quality of work delivered, including all equipment furnished and documentation written or compiled, shall be subject to in process review and inspection during performance. Inspection may be accomplished in plant or at any work site or location, and Marine Corps representatives shall be permitted to observe the work or to conduct inspection at all reasonable hours. Final inspection and acceptance testing shall be conducted at the Contractor's facility. Finally acceptance shall be conducted on 100 percent of items to verify that the units meet all requirements.

Acceptance testing. The HSHM Cranes IROANed under the provisions of this SOW shall be accomplished in accordance with TM 09109A-24/2, MCO P11262.2A, and this SOW.

3.9 **REJECTION** - Failure to comply with any of the specified requirements listed herein shall be reason for rejection by the Weapon System Manager and/or their representative(s). The Contractor at no additional cost to the Marine Corps provide the following:

a. Develop an approach for modification or correction of all deficiencies.

b. On approval of a documented approach, the Contractor shall correct the deficiencies and repeat verification until acceptable compliance with acceptance test procedures is demonstrated.

4.0 **Reports** - The following reports shall be provided to the Weapon System Manager and/or their representative. Reports shall be forward to: ATTN: Weapon System Manager (Code 837-2), 814 Radford Blvd, Marine Corps Logistic Bases, Albany Ga., 31704-1128.

4.1 Pre-Induction Checklist. The Contractor shall complete the Pre-Induction Checklist (Appendix A) for each HSHM Cranes IROANed. This document shall be available during final acceptance testing. One copy of each document shall be provided to the Weapon System Manager and/or their representative(s) after final acceptance of the HSHM Cranes, or upon request.

4.2 Final Inspection Checklist. The Contractor shall complete the Final Inspection Checklist (Appendix B) for each HSHM Cranes IROANed. This document shall be available during final acceptance testing. One copy of each document shall be provided to the Weapon System Manager/or their representative(s) after final acceptance of the HSHM Cranes, or upon request.

4.3 Configuration Checklist. The Contractor shall complete the Configuration Checklist (Appendix C) for each HSHM Cranes IROANed. This document shall be available during final acceptance testing. One copy of each document shall be provided to The Weapon System Manager and/or their representative(s) after final acceptance of the HSHM Cranes, or upon request.

4.4 Load Test Certification/Condition Inspection Report. A completed Load Test Certification and Condition Inspection Record shall be over packed with each HSHM Cranes IROANed. Condition Inspection Record is found in MCO P11262.2A. All inspection items listed in this report may not apply to the HSHM Cranes. Inspections items that do apply shall be functional and pass inspection requirements. Mark inspection items that do not apply as N/A.

PRE-INDUCTION CHECKLIST
HIGH SPEED, HIGH MOBILITY CRANES

Vehicle NSN _____
Vehicle Serial Number _____
Vehicle Hours _____
Use this sheet to record Operational Checkout results. Perform the operational checks before installing any test equipment.

CRANE, TRUCK MOUNTED (HSHMC) **Basic Crane NSN 3810-01-268-1737** **Pile Driver Crane NSN 3810-01-320-1920**	**SAT**	**MISSING**	**SERVICE**	**ADJUST**	**REPAIR**	**REPLACED**	**MODIFY**	**REMARKS**
1. **Engine Assembly**								
Condition								
Operation								
Leakage								
Mounting								
Screws								
Washers								
Nuts								
Paint								
Spec Conformance								
Coverage								
Lubrication								
Application and type								
Oil Analysis Results								
Pass _____ Fail _____								
2. **Fuel System**								
Condition								
Leakage								
Fittings								
Mounting								
Clamps and Bolts								
Components								
1. Injector and Injector Lines								
2. Shutoff Solenoid								
3. Fuel Pump								
4. Fuel Tank								
5. Fuel Supply Lines								
6. Water Separators								

3. **Engine Cooling System** Condition Leakage Clamps and Fittings **Components** 1. Radiator 2. Water Inlet Manifolds 3. Oil Cooler 4. Coolant Heater Pump 5. Fan Assembly 6. Fan Shroud 7. Water Pump Drive Assy								
4. **Engine Accessories** **a. Cold Start Assembly** Condition Lines and Hoses Mounting **b. Air Cleaner Assembly** Condition Mounting Hoses								
5. **Alternator** Condition Operation Mounting Tested as per STE/ICE-R								
6. **Engine Starter** Condition Operation Mounting Tested as per STE-ICE-R								
7. Vehicle Electrical System Condition Operation Mounting **Components** 1. Panel Gauges 2. Warning Lights 3. Slaving Receptacle 4. Switches 5. Fuses and Circuit Breakers 6. Wiring Harnesses 7. Windshield Wiper Assy								

8. Vehicle Lights 9. Vehicle Work Lights 10. Defrost Fan Assemblies 11. Collector Ring Assembly								
8. **Carrier Transmission and Torque Converter.** Condition Operation Mounting Leakage Oil Cooler **Shift Control Assemblies** Condition Operation Mounting								
9. **Drive Shafts** Condition Operation								
10. **Axles** Condition Operation								
11. **Suspension** Condition Operation **Components** 1. Torque Rods 2. Suspension Cylinders 3. Accumulators 4. Suspension Lock Valves 5. Pressure Reducing Valve 6. Check Valve 7. Hoses, Fitting, and Clamps								
12. **Hydraulic System** Condition Operation Leakage Hoses and Lines **System Requires Draining or Flushing ?**								

13. **Boom Assembly** Condition Operation Leakage Hoses and Lines Mounting **Components** 1. Three Sectional Boom Assembly 2. Boom Hoist Cylinder 3. Boom Telescope Cylinders 4. Boom Hoist and Telescope Control Valves **Boom Adjustment and Alignment** **Meets MCO P11262.2A Requirements?**								
14 **Load Hoist Winch Assembly** Condition Operation Leakage Mounting Hoses and Lines **Components** 1. Winch Motor 2. Hoist Winch 3. Winch Control Valve 4. Hoist Winch Control Assembly **Meets MCO P11262.2A Requirements?**								
15 **Boom Swing System** Condition Operation Leakage Hoses and Lines **Components** 1. Swing Motor 2. Swing Valves and Components								

3. Swing Reducer 4. Slewing Ring 5. Swing Control Assemblies								
16 **Vehicle Air System** Condition Operation Leakage Hoses and Lines **Components** 1. Air Compressor 2. Air System Control Components 3. Vehicle Brake Chambers								
17 **Vehicle Brake System** Condition Operation **Inspected in accordance with Para. 3.3.2, Subpara R of SOW ?**								
18 **Power Steering System** Condition Operation Leakage Hoses and Lines **Components** 1. Steering Columns 2. Right Angle Steering Gear 3. Power Steering Gear 4. Steering Control Valve 5. Steering Valves 6. Steering Cylinders **Operational Tested From Both Upper and Lower Cabs ?** **Wheel Alignment checked in Accordance with Para 3.3.2, Subpara S of SOW ?**								

19 **Outrigger System** Condition Operation Leakage Hoses and Lines **Components** 1. Extend/Retract Control Valves 2. Outrigger Control Valve 3. Relief Valve 4. Outrigger Cylinders 5. Outrigger Pads and Pins 6. Outrigger Beams **Outrigger System Meets MCO P11262.2A Requirements ?**								
20 **Load Moment System** Condition Operation Mounting **Components** 1. Cable Reel Assembly 2. Reel Control Wiring Harness 3. Anti-Block Switch Assembly 4. Hydraulic Pressure Transducers 5. Computer Console Assembly **Computer Console Contains The Generation III EPROM ?** **Meets MCO P11262.2A Requirements ?**								
21 **Upper/Lower Cab Assemblies** Condition Mounting **Subassemblies** 1. Doors and Door Hardware 2. Vehicle Glass								

3. Windshield Wiper and Washer Assemblies 4. Operator Seats 5. Cab Air Conditioning 6. Rear View Mirror								
22 **Vehicle Sheet Metal** Components Condition Mounting **Components** 1. Sheet Metal Panel and Covers 2. Boom Rest 3. Skirts 4. Fenders 5. Bumpers 6. Ladders 7. Tool Box 8. Sliding Hood and Hood Slides 9. Stationary Hood and Latches 10. Mirror Hardware								
23 **Vehicle Paint** Condition Coverage								
24 **Vehicle Data Plates** Condition Mounting								

ADDITIONAL REMARKS:

FINAL INSPECTION CHECKLIST
HIGH SPEED, HIGH MOBILITY CRANES

Vehicle NSN _____
Vehicle Serial Number _____
Vehicle Hours _____

CRANE, TRUCK MOUNTED HSHMC Basic Crane 3810-01-268-1737 Pile Driver Crane 3810-01-320-1920	**SAT**	**SERVICE**	**TESTED**	**LUBRICATED**	**UNSAT**	**REMARKS**
1. **Engine Assembly** Condition Operation Leakage **Mounting** Screws Washers Nuts **Paint** Spec. Conformance Coverage **Lubrication** Application and Type Level **Oil Filters Replaced 100 Per Cent** **_____ YES _____ NO.**						
2. **Fuel System** Condition Operation Leakage **Mounting** Clamps and Bolts **Components** 1. Injector and Inject Lines 2. Shutoff Solenoid 3. Fuel Pump 4. Fuel Tank						

5. Fuel Supply Lines 6. Water Separators **Fuel Filters Replaced 100 Per Cent** **_____ YES _____ NO**						
3. **Engine Cooling System** Condition Leakage Clamps and Fittings **Components** 1. Radiator 2. Water Inlet Manifolds 3. Oil Cooler 4. Coolant Heater Pump 5. Fan Assembly 6. Fan Shroud 7. Water Pump Drive Assembly **Cooling System Protected to at least -20F as per SOW Requirements. ____ YES ____ NO**						
4. **Engine Accessories** **a. Cold Start Assembly** Condition Lines and Hoses Mounting **b. Air Cleaner Assembly** Condition Mounting Hoses **c. Exhaust System** Condition Mounting **Air Filters Replaced 100 Per Cent** **_____ YES _____ NO**						
5. **Alternator** Condition Operation Mounting **Alternator Drive Belts Replaced 100 Per Cent _____ YES _____ NO**						
6. **Engine Start** Condition Operation Mounting						

7. **Vehicle Electrical System** Condition Operation **Components** 1. Panel Gauges 2. Warning Lights 3. Slaving Receptacles 4. Switches 5. Fuses and Circuit Breakers 6. Wiring Harnesses 7. Windshield Wiper Assembly 8. Vehicle Lights 9. Vehicle Work Lights 10. Defrost Fan Assembly 11. Collector Ring Assembly 12. Batteries and Cables						
8. **Carrier Transmission and Torque Converter.** Condition Operation Mounting Leakage						
9. **Drive Shafts** Condition Mounting						
10. **Axles** Condition Operation Leakage Mounting						
11. **Suspension** Condition Operation Leakage **Components** 1. Torque Rods 2. Suspension Cylinders 3. Accumulators 4. Suspension Lock Valves 5. Pressure Reducing Valve 6. Check Valve 7. Hoses, Fittings, and Clamps **Vehicle Maintains a Level Position without a list to one side.**						

12. **Hydraulic System** Condition Operation Hoses and Lines						
13. **Boom Assembly** Condition Operation Leakage Hoses and Lines Mounting **Components** 1. Three Sectional Boom Assembly 2. Boom Hoist Cylinder 3. Boom Telescope Cylinders 4. Boom Hoist and Telescope Control Valves Boom Adjustment and Alignment **Meets MCO P11262.2A Requirements. ____ YES ____ NO**						
14 **Load Hoist Winch Assembly** Condition Operation Leakage Mounting Hoses and Lines **Components** 1. Winch Motor 2. Hoist Winch 3. Winch Control Valve 4. Hoist Winch Control Assy **Meets MCO P11262.2A Requirements. ____ YES ____ NO**						
15 **Boom Swing System** Condition Operation Leakage Hoses and Lines						

Components 1. Swing Motor 2. Swing Valves and Components 3. Swing Reducer 4. Slewing Ring 5. Swing Control Assembly						
16. **Vehicle Air System** Condition Operation Leakage Hoses and Lines **Components** 1. Air Compressor 2. Air System Control Components 3. Vehicle Brake Chambers						
17. **Vehicle Brake System** Condition Operation **Inspected In Accordance With Para 3.3.2, Subpara. R of This SOW. ____ YES _____ NO**						
18. **Power Steering System** Condition Operation Leakage Hoses and Lines **Components** 1. Steering Columns 2. Right Angle Steering Gear 3. Power Steering Gear 4. Steering Control Valve 5. Steering Valves 6. Steering Cylinders **Operational Tested from Upper and Lower Cabs. ___ YES ___ NO** **Wheel Alignment Checked and Corrected as Required.** **____ YES _____NO**						

19. **Outrigger System** Condition Operation Leakage Hoses and Lines **Components** 1. Extend/Retract Control Valves 2. Outrigger Control Valves 3. Relief Valves 4. Outrigger Cylinders 5. Outrigger Pads and Pins 6. Outrigger Beams **Meets MCO P11262.2A Requirements. ____ YES ____ NO**						
20. **Load Moment System** Condition Operation Mounting **Components** 1. Cable Reel Assembly 2. Reel Control Wiring Harness 3. Anti-Two Block Switch Assy 4. Hydraulic Pressure Transducers 5. Computer Console Assy **Computer Console Contains the Generation III EPROM. __ Y __ N** **Meets MCO P11262.2A Requirements. ____ YES ____ NO**						
21. **Upper/Lower Cab Assemblies** Condition Mounting **Subassemblies** 1. Door and Door Hardware 2. Vehicle Glass 3. Windshield Wiper and Washer Assemblies. 4. Operator Seats						

5. Cab Air Conditioning 6. Rear View Mirrors						
22. **Vehicle Sheet Metal Components** Condition Mounting **Components** 1. Sheet Metal Panels and Covers 2. Boom Rest 3. Skirts 4. Fenders 5. Bumpers 6. Ladders 7. Tool Box 8. Sliding Hood and Hood Slides 9. Stationary Hood and Latches 10. Mirror Hardware						
23. **Vehicle Paint** Condition Coverage Spec. Conformance						
24 **Vehicle Data Plates/Decals** Condition Mounting **IROAN Data Plate Installed.**						
25. **Vehicle Load Testing** Condition Marking **Vehicle Load Tested in Accordance with MCO P11262.2A.** **_____YES ____NO** **Load Test Date Annotated on Boom in Accordance with Para.3.3.3, c. of This SOW.** **____YES _____ NO**						

FINAL INSPECTION CHECKLIST

ADDITIONAL REMARKS:

CONFIGURATION CHECKLIST
CRANE, TRUCK MOUNTED, MODEL HSHMC

VEHICLE:

Marine Corps Registration Number _____.

OEM Model Number _____.

Vehicle Hours at Pre-Induction: _____Hrs.

VEHICLE ENGINE:

Original Vehicle Engine Serial Number _____.

Engine Required Replacement: _____ YES _____ NO

Replacement Engine Serial Number _____.

VEHICLE TRANSMISSION:

Original Vehicle Transmission Serial Number _____.

Transmission Required Replacement: _____ YES _____ NO

Replacement Transmission Serial Number _____.

APPROVED CONFIGURATION CHANGES:

Approved Waivers/Deviations applied during IROAN:

Waivers: _____

Deviations: _____

ECPs generated by approved Waivers/Deviations: _____

Modification/Technical Instructions:

MI 09109A-35/1 Applied Prior IROAN _____, During IROAN _____.

MI 09109A-45/2 Applied Prior IROAN _____, During IROAN _____.

TI 09109A-25/2 Applied Prior IROAN _____, During IROAN _____.

CONTRACT DATA REQUIREMENTS LIST

(1 Data Item)

Form Approved
OMB No. 0704-0188

The public reporting burden for this collection of information is estimated to average 110 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0701-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to the above address. Send completed form to the Government Issuing Contracting Officer for the Contract/PR No. listed in Block E.

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY: TDP ____ TM ____ OTHER X

D. SYSTEM/ITEM	E. CONTRACT/PR NO.	F. CONTRACTOR
Crane, Truck Mounted (HSHMC)		

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
A001	Request For Deviation	Configuration Management

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-CMAN-80640B	SOW 3.4.2	MCLBA (825)

7. DD 250 REQ	8. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT	A	ASREQ	SEE BLK 16

9. APP CODE	11. AS OF DATE	13. DATE OF SUBSEQUENT SUBMISSION

17. PRICE GROUP

18. ESTIMATED TOTAL PRICE

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES Draft	Final Reg	Final Repro
MCLBA (825-2)	0	1	0
15. TOTAL →	0	1	0

16. REMARKS

Blk 4 - Contractor format is authorized.

Blks 10 & 12 - RFDs shall be submitted to obtain authorization to deliver nonconforming material which does not meet prescribed configuration documentation.

RFDs will be reviewed and disposition determined within 30 calendar days upon receipt by the Government.

RFDs shall be transmitted via E-Mail to the following address: mbmatcomconfigmngmnt@matcom.usmc.mil

Distribution Statement A: Approved for public release, distribution is unlimited.

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE
[signature]	9-24-99	[signature]	9/29/99

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A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY: TDP ____ TM ____ OTHER X
D. SYSTEM/ITEM: Crane, Truck Mounted (HSHMC)	E. CONTRACT/PR NO.	F. CONTRACTOR

1. DATA ITEM NO.: A002	2. TITLE OF DATA ITEM: Request For Waiver	3. SUBTITLE: Configuration Management	17. PRICE GROUP
4. AUTHORITY (Data Acquisition Document No.): DI-CMAN-80641B	5. CONTRACT REFERENCE: SOW 3.4.2	6. REQUIRING OFFICE: MCLBA (825)	18. ESTIMATED TOTAL PRICE
7. DD 250 REQ: LT	9. DIST STATEMENT REQUIRED: A	10. FREQUENCY: ASREQ	12. DATE OF FIRST SUBMISSION: SEE BLK 16
8. APP CODE		11. AS OF DATE	13. DATE OF SUBSEQUENT SUBMISSION

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Carl Pitts	9-24-99	Terrell K Hall	9/24/99