

# Armed Forces Pest Management Board

## Technical Guide No. 31

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### RETROGRADE WASHDOWNS:

### Cleaning and Inspection Procedures

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## **DISCLAIMER**

Any mention of specific proprietary products regarding washing equipment or safety items does not constitute a recommendation or an endorsement of these products by the Department of Defense. Neither should the absence of an item necessarily be interpreted as DoD disapproval. The material presented in this Technical Guide (TG) are guidelines. Information or inquiries concerning any equipment or safety items should be sent through Command Pest Management Professionals or Applied Biologists to the Armed Forces Pest Management Board Quarantine Committee for evaluation.

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## **FOREWORD**

This Technical Guide (TG) is not a regulation or instruction. Rather, it describes procedures, outlines responsibilities and defines requirements for conducting retrograde washdowns to satisfy agricultural and public health pest exclusion requirements for re-deploying ships, aircraft, and equipment from OCONUS (outside the continental United States) locations. Other cleaning methods (compress air cleaning and mechanical removal-sweeping) may be appropriate given the sensitivity of equipment or feasibility of using water. This document will be periodically reviewed and updated to insure that information contained herein reflects current procedures, rules and regulations.

Individuals using this TG are encouraged to submit comments and suggestions for improvement. Comments should be directed to the Executive Director, Armed Forces Pest Management Board, Walter Reed Army Medical Center, Forest Glen Section, Washington, DC 20307-5001; (301) 295-7476; FAX (301) 295-5045.

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## **INTRODUCTION**

Retrograde washdowns are performed to safeguard United States agriculture and natural resources from risks associated with the entry, establishment, or spread of animal/plant pests and noxious weeds. This Technical Guide (TG) provides information on cleaning techniques and inspection procedures currently used by Department of Defense (DoD) personnel responsible for washing and reviewing equipment, supplies and vehicles.

### **Background Information**

Over the past 200 years, several thousand foreign plant and animal species have become established in the United States. About one in seven has become invasive, leading to problems that, according to figures provided by Cornell University, cost the United States more than \$138 billion each year. An invasive species is an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health. Invasive plants, animals, and aquatic organisms often reduce the economic productivity and ecological integrity of U.S. agriculture and natural resources.

The most common vertebrate invasive species in the continental United States include nutria, house sparrows, European starlings, and commensal rodents (roof rat, Norway rat, and house mouse). Additionally, numerous invertebrate invasive species have also become established in the United States. Examples include zebra mussels, imported fire ants, Africanized honey bees, and many other insects. In Hawaii and some mainland States, feral pigs, goats, and cats have severely impacted natural and environmental resources. Feral animals are domesticated animals that have escaped and become wild, including their offspring born in the wild.

### **Effects of Invasive Species**

Many invasive species clearly impair biological diversity by causing population declines, species extinctions, shifts in predator/prey dynamics, shifts in species niches, changes in habitat, and reductions in ecosystem complexity. The very establishment of a harmful invasive species diminishes biological diversity because, as certain species disperse to more places, the originating and invaded areas become more alike biologically.

In 1993, Congress' Office of Technology Assessment reported that devastating invasions of plants, insects, aquatic invertebrates, pathogens, and other organisms have changed ecosystems and permanently diminished the biological diversity associated with them. Examples of these in the United States include: melaleuca (a wetlands tree), gypsy moth,

spruce bark beetle, zebra mussel, larch canker, chestnut blight, and pinewood nematodes. Fear of the incursion of other harmful invasive species, such as the brown tree snake, is increasing.

Conservation experts have found that in the United States, invasive alien plant infestations cover 100 million acres and are spreading at a rate of 14 percent per year, an area twice the size of Delaware. Recent studies have also revealed that San Francisco Bay is invaded by a new exotic species on the average of once every 12 weeks.

## **Movement**

Naturally occurring movement of species into the United States is uncommon. Most invasive species arrive in association with human activities or transport. Species can be brought into the country and released intentionally, or their movement and release can be an unintentional byproduct of cultivation, commerce, tourism, or travel.

Many species enter the United States each year as contaminants of commodities. Agricultural produce, nursery stock, cut flowers, and timber can harbor insects, plants pathogens, slugs, and snails. Weeds continue to enter the United States as seed contaminants. Plant pathogens sometimes arrive as unintended contaminants of plant materials.

Fish and shrimp pathogens and parasites have been introduced into the United States on infected stock for aquaculture. Crates and containers can harbor snails, slugs, mollusks, beetles, and microorganisms. Military cargo transport also brings in harmful species, such as the Asian gypsy moth and brown tree snakes. Ballast water that is released from ships as cargo is loaded or unloaded has brought in several destructive aquatic species.

## **Safeguarding the United States from Invasive Species**

Executive Order 13112 enhances and orders coordination of Federal activities to control and minimize the economic, ecological, and human health impacts caused by invasive species. The Executive order also established a National Invasive Species Council to oversee a management plan detailing the goals and objectives of the efforts of the involved Federal agencies. This Executive order provides new impetus and importance to the basic work performed by the U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) to prevent pests and diseases that threaten our biological resources from being introduced and becoming established in the United States.

Both ecosystems and the individual species within them are vulnerable to invasive pests and pathogens. In protecting the United States from harmful invasive species, APHIS is responsible for excluding and managing invasive species that can potentially affect plant and animal health, either directly or indirectly. Through its activities, APHIS protects not only agriculture but also forest, rangeland, and wetland ecosystems. APHIS works closely with USDA's Forest Service and the U.S. Department of the Interior's Bureau of

Land Management, National Park Service, Fish and Wildlife Service and the Department of Defense. APHIS controls certain types of invasive species and vertebrate pests that affect native ecosystems, rather than agricultural resources. Certain specific activities focus on protecting and managing endangered species as well as migratory bird populations.

The first and most effective means of protection is through exclusion or prevention of intentional or unintentional entry of harmful invasive species. A second strategy uses tactics including detecting, eradicating, managing, or controlling specific pests that have become established. Third, certain endangered species need special protection against a host of attackers. Invasive species can be a threat to indigenous endangered species.

**Military Importance:** Clearly, the potential importation of invasive species, such as snakes, insects, snails, and various crustaceans on military vehicles and equipment that are present in most of the world-wide areas frequented by the DoD is a primary concern of the USDA.

DoD personnel are often required to re-deploy from anywhere in the world. Associated with this movement is an elevated risk for the inadvertent introduction of exotic plant and animal pests into the United States. Due to the characteristics of exotic pests, irreparable damage to human health, agriculture, forestry, or the environment may result.

Plant debris, garbage, food, soil, and even fresh water from foreign countries may contain organisms of quarantine importance. Pathogens, insects, nematodes and a variety of other animals may be carried in such media. These organisms, if allowed to enter the United States, could proliferate to catastrophic proportions, unhindered by natural enemies. Because of this risk, it is DoD policy that all organizations and personnel involved in the movement of DoD sponsored cargo, personal property and accompanied baggage will take all steps necessary to prevent the spread of exotic pests from one location to another.

As a means to standardize, regulations and procedures pertaining to military retrograde cargo washdowns were outlined in DoD Instruction 4500.35 (Processing and Shipping DoD Sponsored Retrograde Material Destined for Shipment to the United States, its Territories, Trusts and Possessions) initially during the Viet Nam war era. Since this time, several additional instructions and guidance documents have been developed and/or modified to insure the successful completion of washdowns.

**Current Information:**

1. The Federal Plant Protection Act 2000 (Title IV of Pub. L. 106-224) is legislation which prohibits introducing any animal, plant or material that is considered harmful to this country's agriculture. The U.S. Department of Agriculture (USDA), Plant Protection and Quarantine Division, is the enforcement authority for this Act. Executive Order 13112 provides information regarding invasive species. DoD Instruction 4715.5 establishes policy, assigns responsibilities and prescribes procedures for establishing the implementing environmental guidance and standards to ensure environmental protection

at DoD installations and facilities in foreign countries. Port of entry inspection has been transferred to the Department of Homeland Security, Customs and Border Protection, Agriculture Inspection (CBP-AI). Ports Of Entry Ports of entry are responsible for daily port specific operations. There are 317 official ports of entry in the United States and 14 preclearance stations in Canada and the Caribbean. Port personnel are the face at the border for most cargo and visitors entering the United States. Here CBP enforces the import and export laws and regulations of the U.S. federal government and conducts immigration policy and programs. Ports also perform agriculture inspections to protect the USA from potential carriers of animal and plant pests or diseases that could cause serious damage to America's crops, livestock, pets, and the environment. Appendix H provides contact information.

2. The combined service instruction (SECNAVINST 6250.2A/AR 40-12/ AFJI 48-104) defines DoD quarantine policies and procedures dictated by the US Departments of Health and Human Services; Agriculture; Treasury; Interior and Commerce. These regulations are intended to prevent the introduction and dissemination domestically or elsewhere of diseases of humans, plants and animals. Most recently, DoD 4500.9-R (Defense Transportation Regulation Part V) provides customs inspection and agricultural pre-clearance guidelines for DoD. AFI 24-401 and AFI 24-403 through 405 provides additional Air Force guidelines for air transportable retrograde cargo.

## **WASHDOWN LOCATION**

A. Performing an efficient and effective washdown requires specific physical facilities for cleaning and inspection. Appendix A outlines the criteria for selecting and equipping a washdown location. In addition, an experienced military inspector familiar with USDA requirements and previous operational washdown participation should be consulted when possible and included on early reconnaissance trips to potential washdown locations. Care should be taken to consider adverse effects of the wash operation and to minimize release of used water and contaminants into the local environment. See DoD Directive 6050.16 and the Overseas Environmental Baseline Guidance Document for further details.

B. Host Nation Requirements. Every effort should be made to comply with host nation laws and regulations related to washdown operations. Coordination with local quarantine and health officials is important to maintaining a good relationship with the host nation.

## **OPERATIONAL WASHDOWN EQUIPMENT**

Appendix B lists the items recommended to perform a successful washdown. This list is subject to modification based on the size and location of the washdown and availability of foreign national assistance.

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## **INSPECTION AND CLEANING PROCEDURES**

The inspectors must enforce strict, non-compromising decisions. Personnel involved in an operational washdown must follow Appendix C guidelines in order to expedite re-entry approval into CONUS by USDA and USPHS officials.

### **A. Inspectors**

1. Per 4500.9-R (Defense Transportation Regulation Part V), military law enforcement personnel currently serve as Customs Border Clearance Agents (CBCA) and agricultural washdown inspectors. U.S. European Command (USEUCOM) Directive 30-3 is used in the European theater as the standard inspection guideline. Appendix D shows a typical staging and processing flow chart for an operational washdown.

2. The Air Force Chief of Transportation at the respective overseas base is responsible for overall inspection criteria and approval per AFI 24-401 and AFI 24-403 through 405, involving Air Force equipment and cargo returning to CONUS. A combined instruction, OPNAVINST 3710.2E /AFI 24-405, was developed by the Air Force and adopted by the

Navy as a foreign clearance guide for U.S. Naval Aircraft from foreign ports destined for CONUS.

**B. Administrative requirements.** Necessary administrative requirements will be established by military inspectors for USDA's review and final inspection at the point of entry.

1. Tags attached to each vehicle after cleaning are appropriate for marking vehicles. Cleaning must be accomplished on personal gear and removable items as noted in Appendix C. A sample of a vehicle tag is shown in Appendix E.

2. An inspection log should be kept to track the number of vehicles and insure a double check for the tagged vehicles. A sample format for the log is shown in Appendix F.

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## **RESPONSIBILITIES**

During any operational washdown, certain agencies or individuals must assume the many responsibilities that will occur. The following provides a template for comparison within each specific service.

**A. DoD.** The Department of Army (DALO-TSP) is the DoD Executive Agent for the Military Customs Inspection Program (MCIP-Applicable in EUCOM where there is a permanent APHIS Advisor). Overseas Unified Commanders are responsible for compliance with DoD Directive 4500.9 (establishes guidelines for processing and shipping DoD sponsored retrograde materiel).

**B. Headquarters or Highest Operational Command:** Requests to this command should be made when lower echelon commands need upgraded manpower requirements for inspection teams, if teams cannot be acquired through internal resources.

### **C. Major Echelon Involved**

1. The major echelon will probably be stationary within CONUS or its main base. However, coordination on operational washdowns will generally occur at this level, including needed technical advice on all matters pertaining to operational washdowns.

2. Deploying units may request a detailed brief on how to conduct the operational washdown from this organizational level. Sufficient resources at this level would include applicable references and the senior inspector's support requirements (equipment, personnel augmentation, subject expert support).

3. Requests to the senior inspector for other inspection team members can be made regarding appropriate USDA quarantine compliance requirements for clearing retrograde cargo.



4. This level of command will probably provide budgeting and funds for travel of inspection teams to operational washdown sites during contingency and training exercises.

5. The senior inspector of this command level usually has the final authority in the operational washdown for certifying pest-free vehicles, equipment, and supplies. Some exceptions do exist as follows:

a. Ship or aircraft commanders in the case of mission requirements and operational necessity may be forced to proceed to CONUS with a partial certification.

-If only a partial certification is provided, the senior inspector will notify the appropriate USDA-APHIS Officials in Riverdale, Maryland, as well as local officials of Customs and Border Protection (CBP), with copies to interacting commands as necessary. The notification generally details the extent of the certified material and specifies whether or not it is segregated from uncertified equipment and supplies.

-In the case of notification on a partial certification, appropriate commands must notify local CBP-Agriculture Inspectors and should assist the incoming activity to prepare for the reception of embarked equipment by the USDA upon its arrival in CONUS.

#### **D. Commander or On-Site Deployed Command with Overall Authority**

1. The on-site deployed command should schedule with USDA Preclearance officials for coordination and briefing of members actually involved in the deployment and subsequent washdown.

2. Where washdown facilities are not fully adequate at the proposed overseas loading port, base, or airport, the deployed command will need to coordinate with in-country contacts or liaison agencies to delineate shortfalls and determine suitable solutions. Additional coordination may be required to negotiate through host nation support agreements as in the case of adequate fresh water washdown facilities at a final overseas loading port or site.

#### **E. Commander, Specific Deployed Units On-Site**

1. This on-site unit will be able to determine the scope and extent of operational washdowns needed, based on the amount of equipment and supplies that need washing and inspecting. Since this unit will be doing the washdown, additional briefings with the senior inspector, USDA Preclearance officials, and the appropriate staff members should be followed up, particularly if previous briefings have not been accomplished by the higher echelon command.

2. By utilizing pertinent guidance given in Appendix A, and working with staff personnel, this unit would be able to formulate a comprehensive plan for the operational washdown.
3. Washdown equipment in Appendix B will be used by unit personnel. The unit should make sure the equipment is available.
4. The inspection and cleaning procedures outlined in Appendix C will be followed by personnel and therefore becomes an important consideration for review prior to the washdown period.
5. By working with the respective departments, appropriate personnel at this level can determine equipment and supplies that were not exposed to foreign soil contamination and which will not be off-loaded for the operational washdown. These items should be listed and certified free of contamination in writing to the senior inspector.
6. Potential contamination problems when back loading equipment, supplies, and vehicles from previous operations ashore are best considered at this level of command.
7. The senior inspector will need personnel and equipment requirements to include additional inspectors, required vehicles, radio operators, and radios for the operational washdown. The deployed unit on-site will be expected to assist the senior inspector in these needs.

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## **Contaminated Cargo**

Because only a specific sample of cargo entering CONUS ports of entry are examined by inspectors, there is a risk of some reaching an ultimate destination contaminated. In the event this occurs it is critical that a report is made to the local APHIS State Plant Health Directors (SPHD).

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## **SUMMARY**

Information in this TG is intended to serve as minimum guidance for conducting operational washdowns to meet regulatory requirements. Consult with USDA APHIS Riverdale, Maryland quarantine officials and the Armed Forces Pest Management Board to identify recent changes in Quarantine requirements and new developments regarding techniques before proceeding with pre-deployment briefings.

## REFERENCES

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DD 2855, US Military Cargo Preclearance Program Form, June 2002.



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DoD Instruction 4715.5, Management of Environmental Compliance at Overseas Installations, April 22, 1996



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NAVMED P-5010-8, Navy Preventive Medicine, Chapter 8, Insect and Rodent Control, Sep 87.

OPNAVINST 3710.2E/ AFR 8-5, Foreign Clearance Procedures for U.S. Naval Aircraft, 6 Apr 84.

SECNAVINST 6210.2A/ AFIJ 40-12, Medical Service Quarantine Regulations of the Armed Forces, 24 Jan 92.



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# **APPENDIX A**

## **CRITERIA FOR SELECTING AND EQUIPPING A WASHDOWN LOCATION**

### **I. Location Criteria**

#### **A. Hardstand**

1. The availability of hardstand is a major limiting factor determining the duration of an operational washdown. Hardstand is defined as a surface that, even when wet, will not allow any soil transfer to tires of clean vehicles. Hardstand is absolutely essential in:

- Areas associated with the actual washing of vehicles,
- Areas used for off-loading and cleaning vehicle accessory items,
- Staging areas for clean vehicles awaiting backload
- All roads in between the above areas.

a. In reviewing the hardstand area, consider wash water run-off into aquatic habitats including marine environments. Petroleum or other contaminants washed from vehicles may pass directly into such areas, causing harm to aquatic life.

b. During the planning phase, consider constructing berms or implementing other containment strategies and possibly re-utilizing the wash water.

2. The size of hardstand required will vary with the number of vehicles and the amount of time available. However, the following minimum criteria are required so as not to impede traffic flow during an operational washdown assuming a six vehicle capacity wash rack:

a. A washdown area of at least 150 feet (46 meters) on either end of the wash rack assembly and 50 feet (15 meters) on the sides parallel to the flow of equipment.

b. The staging area for accessory vehicle items and palletized supplies should be at least 100 feet (30 meters) meters wide and 350 feet (110 meters) long.

c. The size required for the clean vehicle staging area will vary depending on how soon after washing/inspection back loading can begin. If the vehicle/cargo decks on board the ships or aircraft must be cleaned before backload can proceed, then establish a staging area capable of holding a larger number of vehicles. Ensure vehicles do not become re-contaminated during the backload.

## B. Fresh Water Availability:

1. Large quantities of fresh water are consumed in a relatively short period of time during washdown operations (SALT WATER MUST BE AVOIDED AS IT WILL CORRODE VEHICLES).

-Approximately **250,000 gallons** are required for an average Army battalion or Marine Expeditionary Unit composed of **300 wheeled vehicles** using **two (2), 5.0" (130 mm) diameter** fire hoses operating at the minimum recommended **pressure of 90 psi**.

**2. In many areas only gray water is available. Gray water is defined as non-saline, but with a number of contaminants from prior use. Though not used for sewage purposes, the storage of this water and the absence of chlorine make it a potential disease carrier for those in close contact with it during washing operations. Basic immunizations are needed. Due to direct and indirect health risks to personnel associated with sewage contaminated water, black water is not authorized. (NOTE: POTENTIAL HEALTH HAZARDS ARE CLEARLY ASSOCIATED WITH USING SEWAGE (BLACK) CONTAMINATED WATER NOT ONLY TO WASHDOWN PERSONNEL BUT OTHERS WHICH MAY CONTACT THE EQUIPMENT).**

3. In addition to water quantity, insure adequate water pressure is maintained throughout the operation (at least 90 psi).

**C. Weather Conditions:** Adverse weather conditions may delay or interrupt an operational washdown. Health and safety of the work crews during operational washdowns scheduled in areas where cold or even cool weather might be encountered is a significant concern. Consult a physician familiar with cold weather medicine before a washdown is scheduled in areas where the effective temperature (including wind chill factors) might be below 45 F. The length of time these work crews are exposed to cold and freezing water is an additional factor that must be considered.

## II. Equipment Selection

A. The following equipment is considered essential to the success of an operational washdown.

1. **Wash racks:** The design and number of wash racks will largely determine the speed at which the operational washdown can be conducted.

a. Wash racks must be designed with regards to the following parameters:

-Personnel safety

-Efficiency of vehicle movement on and off the rack

-Ease of work for the cleaning personnel.

b. Adequate clearance between the bottom of the vehicle and the ground is critical to adequately wash, inspect and if necessary re-wash and inspect the undercarriage. If the vehicle is too close to the ground, work crew efficiency and the inspection/rewash process is adversely affected resulting in extending the time required to complete the washdown.

c. The number of wash racks necessary will vary with the amount of space available. Additionally time dedicated to cleaning each vehicle will vary depending on its initial condition and number of wash racks. **Historically, the washdown proceeds at an average rate of one vehicle per individual wash rack per half hour of daylight.**

d. A person should be assigned to guide vehicles up and down the wash racks to maintain a high safety margin.

2. Water Pumps/hoses. The design, output and reliability of pumps can affect the speed of a washdown operation. The following provides minimum requirements and suggestions:

- A minimum of two (2) hose lines for each individual wash rack.
- Pumps should be capable of sustaining a minimum output pressure of 90 psi for many hours of continuous use.
- Fire Department pumper trucks will work well and are usually available at any seaport, airport, or military base. Several hose lines with 90 psi outputs can be routinely operated off a single truck.
- A supply of new hoses should be kept in reserve for use during the washdown in the event of ruptures.

## APPENDIX B

### OPERATIONAL WASHDOWN EQUIPMENT

The following guidelines can be used for operational washdowns with an average Marine Expeditionary Unit, Army Regiment, or Air Force Squadron.

#### Wash Rack Site

<b>Equipment</b>	<b>Quantity</b>
Floodlight Set	6
Cranes	As required
"Y" gates	3
Fire Hose (1"ID)	600ft/2 per wash rack
Fire Hose (2" ID)	200ft/2 per wash rack
Fire Hose (5" ID)	200ft/2 per wash rack
Fire nozzles (2 per wash rack)	8
Pump (55 GPM or greater)	2
Water truck (5000 gallon)	1
Steam hose (1" ID, 12 ft lengths)	6
Steam hose (1" ID)	300 ft
Air compressor	2
Steam manifold (6 stations)	1
Flatbed Trucks movement of supplies	As required
Portable head	2
Vehicle wash racks	4
Wet/Dry Vacuum	6 or more as required

#### Personal Gear

<b>Equipment</b>	<b>Quantity</b>
Cold/Wet Weather Clothing	40 sets (sizes)
Hard Hats	40
Straw brooms	40
Putty Knives	200
Steel Rod (5 ft lengths)	12
Safety Goggles	40
Rubber Gloves	20 pair (assorted sizes)
Flashlights	24
Batteries (D-cell)	8 boxes/12 per
Rubber Boots	15 pair (assorted sizes)
Water tank (3000 Gallons)	2
Wire Brushes	100
Rags	As required
Ear plugs	25 pairs
Garden Hose/nozzles	75 ft
Scrub brushes	100
RT Forklift	4
Steam Jenny	Minimum 2 as required for aircraft
Small flat bladed screwdriver	12 minimum for cleaning tracks
Waterless hand sanitizer	1 gallon
Towels	3 dozen



1. All locks on compartments, boxes, tool chests, and other items must be removed prior to inspection. If keys cannot be found, provisions must be made to cut the locks.
2. Any required tools, such as jacks, tire irons, wrenches, special screwdrivers, or other others need to be available for removal of dual tires, gun mounts, plates, and floor mat bolts on the different vehicles.

## APPENDIX C

# GUIDE FOR UNITS CONDUCTING OPERATIONAL WASHDOWNS

1. **USDA Inspections.** Cleaning and inspection/pre-clearance of retrograde equipment prior to redeployment does not prevent an agricultural inspection upon return to CONUS. However, close coordination with the USDA APHIS usually results in a speedy transition at the CONUS port of entry by the agricultural inspectors from Customs and Border Protection (CBP).

2. **Inspection Standards:** USDA inspection standards only allow a thin film of road dust on vehicles and equipment arriving at the CONUS final port of entry. **Because of these stringent standards, vehicle/equipment washing and inspection will only be conducted during daylight hours to avoid delays returning CONUS. Nighttime washing and inspection using artificial lighting saves very little time as many items may be eventually rewashed and reinspected. Waivers for washing during nighttime conditions under artificial lighting have been obtained in extreme circumstances but must be justified and approved by the USDA-APHIS.**

### 3. Guidelines to be followed prior to conducting Operational Washdown

-**Conference:** Organize a washdown conference to include attendance by representatives from all participating commands and agricultural inspectors.

-**Training:** Place emphasis on organization and training of washdown crews. Establish a suitable washdown crew schedule with adequate supervision at each washdown point by experienced personnel.

-**Vehicle Drivers/Assistant Drivers:** Drivers and their assistants must remain with assigned vehicles and accessory vehicle items throughout the entire washdown cycle. This will ensure timely movement and security of accessory vehicle items and cargo.

-**Washdown-essential Equipment:** Identify and obtain equipment items required to support operational washdowns early-on and schedule this equipment to be back loaded last.

### 4. Equipment/supplies certified as not exposed to contamination:

-Isolate inspected equipment/supplies in holds or specific cargo areas using some form of segregation such as wire screening or ropes to minimize contact with materials that have gone ashore. These areas should be secured to prevent cross-contamination.

-Inspectors should periodically review these areas throughout the washdown to ensure they are free of all dirt, debris, beverage cans, etc.

**5. Environmental Considerations.** Identify and assess potential adverse impacts of the wash operation and take all reasonable actions necessary to minimize the effects of used water and contaminants on the local environment. Fuel, oil, or soap residue in the wash water can result in visible contamination and/or significant fish and other marine organism kills that may invite serious political and financial repercussions from the host nation.

Contaminants must be captured or removed from rinse water to avoid contamination of runoff areas. The large amount of fresh water from wash operations, if allowed to run off into native bodies of salt or brackish water, can seriously alter dissolved oxygen and saline balance. If there are any concerns, consult with your legal staff and DoD Directive 6050.16 (DoD Policy for Establishing and Implementing Environmental Standards Overseas Installations, September 20, 1991) and its Overseas Environmental Baseline Guidance Document.

## **6. Washing Standards**

**A. Vehicles and equipment exposed to contamination and requiring less than a complete detailed cleaning:** This includes any vehicle or equipment that is only minimally exposed to the natural environment because of its operational requirements. Examples would be as follows:

**SHIPS:** Thorough cleaning of all decks holding vehicles or equipment that were contaminated. This includes cleaning soil from recessed areas of the decks, i.e. clover leaves, pad eyes, and tie-down channels, as well as under shelving, corners and other hard-to-reach areas. Some lower decks can be submerged with salt water to satisfactory eliminate contamination problems, such as some Navy amphibious ships (LHAs, LKAs, and LHDs).

**LARGE AIRCRAFT REMAINING ON FLIGHTLINE:** Clean protected areas like wheel wells and around cargo or passenger doors. Visually inspect and assess need to clean cargo and flight deck. **DO NOT USE SALT WATER.**

**AMPHIBIOUS VEHICLES:** This includes Landing Craft Air Cushioned (LCACs), Light Vehicle-Tracks (LVTs), and similar vehicles. Clean troop compartment, crew area, and the crew's personal equipment. Ensure other areas are exposed to salt water during operation. If vehicles washed with salt water are to be transported on aircraft, **all salt water must be removed or contained in such a way as to prevent contamination of aircraft with corrosive salt solutions which can seriously damage airframes.**

**NAVAL VESSEL CAUSEWAYS:** Wash with fresh or salt water during back loading.

**NAVAL SHIP LAUNCHES:** No cleaning is required of the Captain's launch, liberty launch, or other vessels unless they are contaminated (back loaded dirty). A thorough inspection by operator personnel is recommended.

**Vehicles, equipment and supplies exposed to contamination during operational exercises:**

**-ORGANIZATION FOR CLEANING:** Contaminated vehicles, equipment, and supplies are off-loaded. Accessory items and palletized supplies are staged in a pest free zone for cleaning. Vehicles proceed to a steam or washing station as determined by inspectors. Upon final inspection, material from mobile loads is reloaded aboard vehicles and the clean vehicles and supplies are re-embarked.

**-FIXED AND ROTARY WING AIRCRAFT:** Clean cabin area, cockpit, wheels, wheel wells, skid/runner bars, under deck plates, panels, in flap wells and all other areas where foreign debris may have lodged. Clean crew and pilot personal equipment. Always segregate cleaned/certified equipment from that requiring cleaning.

**-LAND VEHICLES:** The cleaning of motor vehicles usually consumes the greatest amount of time and causes the most delays. The following procedures are recommended:

**Complete the following actions before the vehicle arrives at the wash rack-**

-Sweep, compress air clean and/or wet/dry vacuum the vehicle cab and all storage and tool compartments.

-Remove the battery; clean the battery and battery box. Reinstall the battery.

-Remove the outside dual wheels and spare tires and place them in the back for later cleaning at the wash rack.

-Remove all payloads, seat cushions, detachable sideboards, canvas sides/tops and any personal gear brought ashore, and leave at the mobile staging area for cleaning.

-Carefully check the radiator (may be hot). Handpick or sweep any vegetation, insects (arthropods) or other debris.

-Dis-engage the sides of trucks that are equipped with collapsible sides. Clean recessed areas, ledges, etc.

-Remove engine packs from tanks and Bradley Fighting vehicles prior to cleaning (washing).

### **At the wash racks**

-Vehicles will be exposed to high pressure (recommend minimum 90 psi) fresh water or steam (steam may remove valuable protective coatings). Pay particular attention to undercarriages, fender wells, axles, springs, bumpers, wheels and recessed areas. To prevent corrosion, never use salt water to clean vehicles/supplies/equipment.

### **Upon completion of the cleaning procedures**

-Inspect each vehicle thoroughly to ensure that all soil has been removed. Use a flashlight, screwdriver, or putty knife where necessary. The following are common inspection checkpoints:

(1) Top access (particular attention must be paid to crevices in all locations). All the areas mentioned, are primarily located on the "dorsal side" of the vehicle and must be accessed from that perspective.

- a. Floor boards
- b. Battery box
- c. All storage/tool compartments
- d. Motor compartments
- e. Wheels and tires
- f. Windshield base (Jeep M-151)
- g. Front and rear bumper hollows and braces
- h. Radiator front
- i. Truck beds
- j. All other spaces where soil might be found

(2) Bottom access

- a. Fender wells, front and rear including access openings for tail light wiring
- b. Rocker panels
- c. Frame, fore and aft

- d. Coil spring wells, front and rear
- e. Transmission support beam
- f. Rear suspension A-frame, pivot points and drain holes
- g. Trailer hitch bolt recess
- h. Front, side, and rear body lips
- i. Drive shaft tunnel
- j. Power take-offs
- k. Axle brackets
- l. Fuel tanks, between body and tank
- m. Transaxle brackets
- n. Leaf springs
- o. Air tank braces
- p. All other spaces where soil might be found

### **Tracked Vehicles**

The cleaning of tracked vehicles is by far the most difficult and time consuming task of the entire operational washdown. It is strongly recommended that cleaning begin on board ship as soon as possible after the final contingency or exercise because of the excessive amount of time required to properly clean tracked vehicles. All soil impacted in the treads, around the rubber cleats, in the tread connectors, between and behind tread guides and roller supports, and all other spaces must be removed. The interiors must be soil free, including the battery box. The bilges may contain some sand, but only if it is mixed with salt water. **If tracked vehicles are to be transported on aircraft, all salt water must be removed or contained in such a way as to prevent contamination of aircraft with corrosive salt solution.** Tracked vehicles may be cleaned in the ship's well deck, with enough space for one complete revolution of tread. Tracked vehicles may be cleaned on shore only if they can be loaded without re-contaminating the treads.

### **Supplies and Equipment**

Thoroughly clean mount-out boxes/Hardigg-like cases, field desks, communications equipment, and similar items with hand brooms, rags, and other non-water methods. Compressed air may also be used. Specifically concentrate on cracks, crevices, and

recesses. Personnel must clean pallets, including the supplies and equipment, of compacted soil and vegetation. If necessary, crews may have to break down pallet loads to accomplish the appropriate level of cleaning. Padlocked boxes must also be inspected. Personnel with keys must be standing by, otherwise locks will be forced open.

Camouflage nets, tents, and canvas are difficult to properly clean. Hand cleaning, although time consuming, is the most effective method.

Spread out tents and canvas on a pest free surface and swept down (no water) on both sides, paying attention to seam and flaps. Compressed air may also be used during the cleaning process.

Take ashore only essential personal gear during the washdown. Personal gear will not be inspected at the washdown site. However, all personal gear taken ashore is considered contaminated and will be subject to cleaning and inspection.

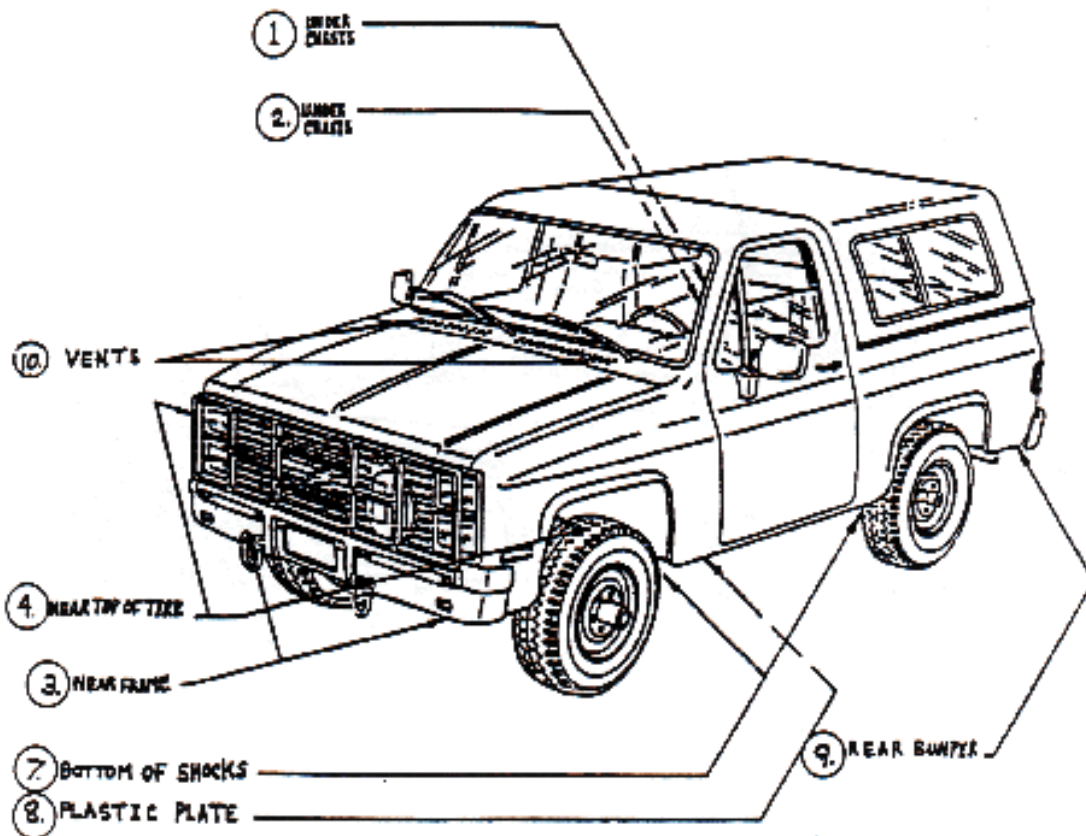
**Individual weapons will be inspected by unit commanders or their designated representatives.**

**Illustrations of Specific Problem Areas By Vehicle Type**

**(ARROWS DESIGNATE AREAS OF CONCERN)**

**WHEELED VEHICLES**

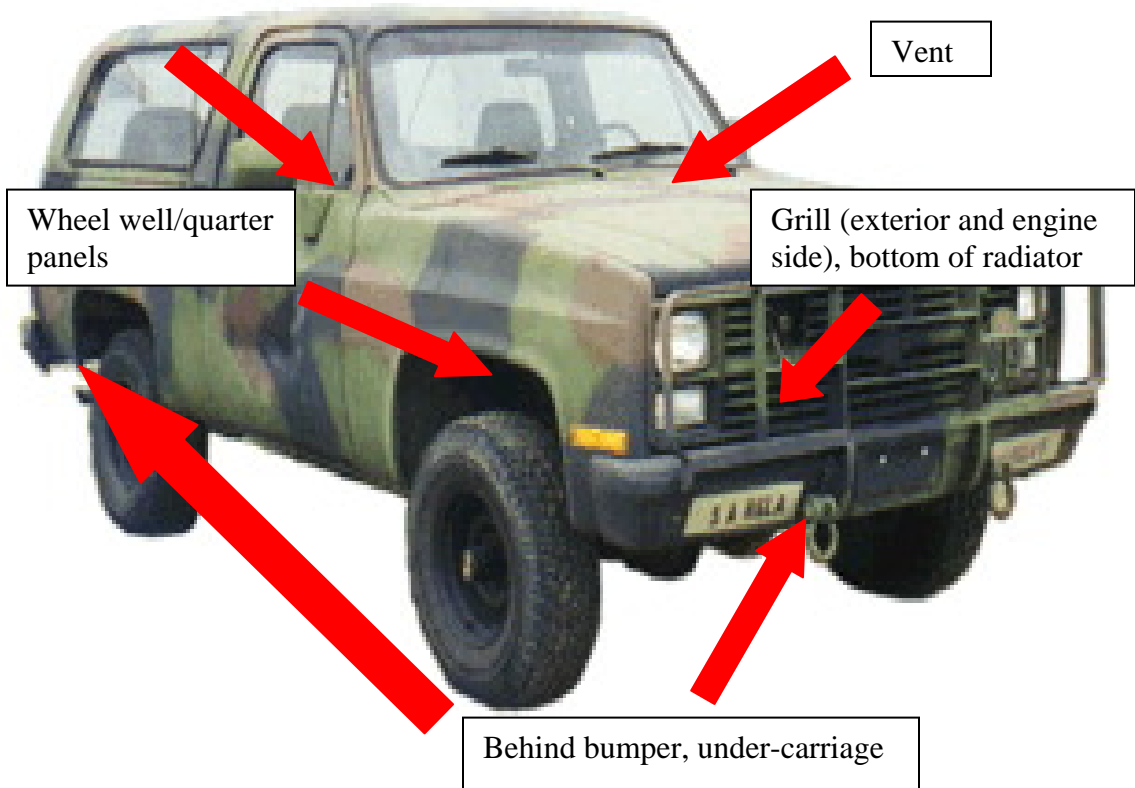


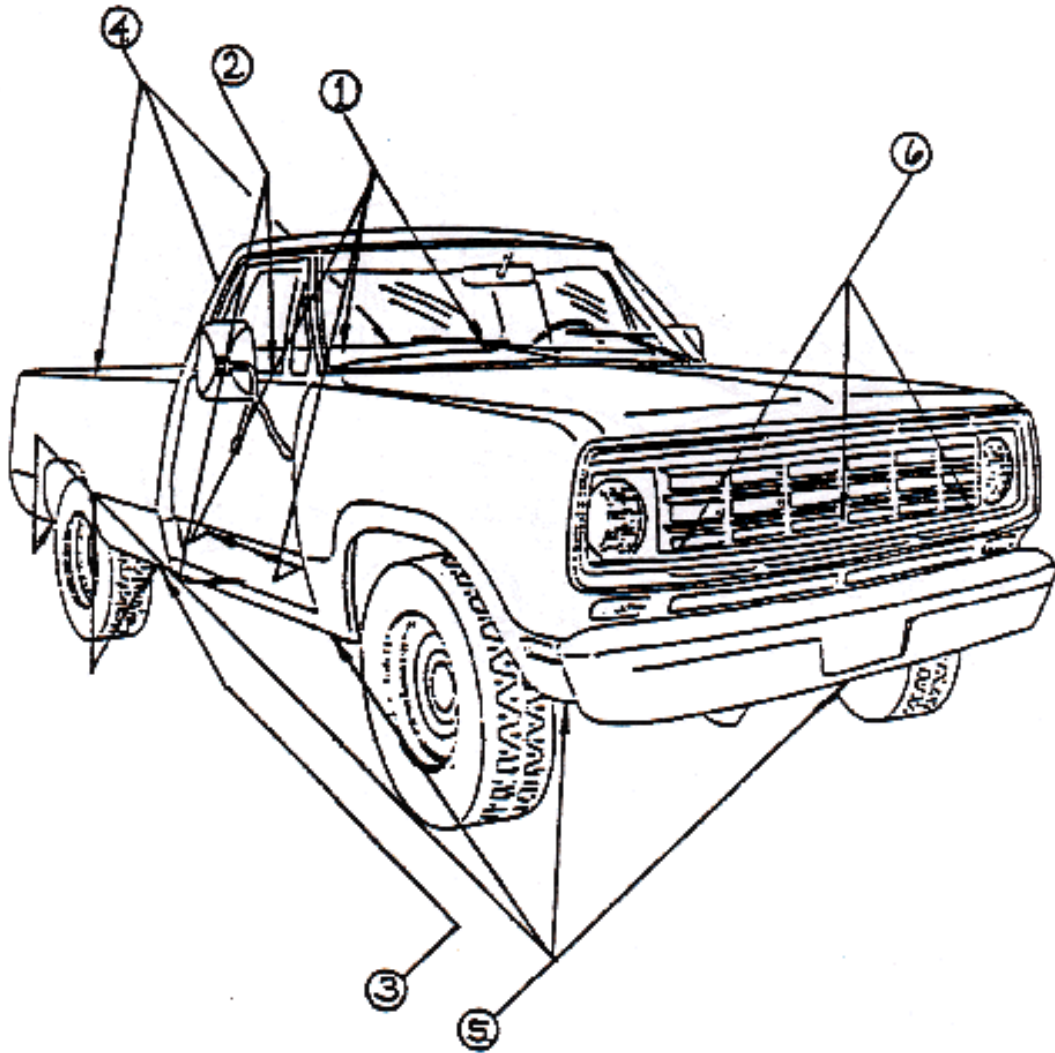


### PROBLEM AREAS

1. Fuel tank filler tube where it enters vehicle body.
2. On top of fuel tank protector.
3. Shackles on stabilizer bar.
4. Top of front brake calipers.
5. Inside cab underneath edge of floor mats, weapon rack area and spare tire area.
6. On top of transmission.
7. Bottom of shocks where they join the axles.
8. Above plastic protective plate behind vehicle's front tires.
9. Rear bumper area (especially where plate covers wiring that leads to blackout lights).
10. Hood vents.

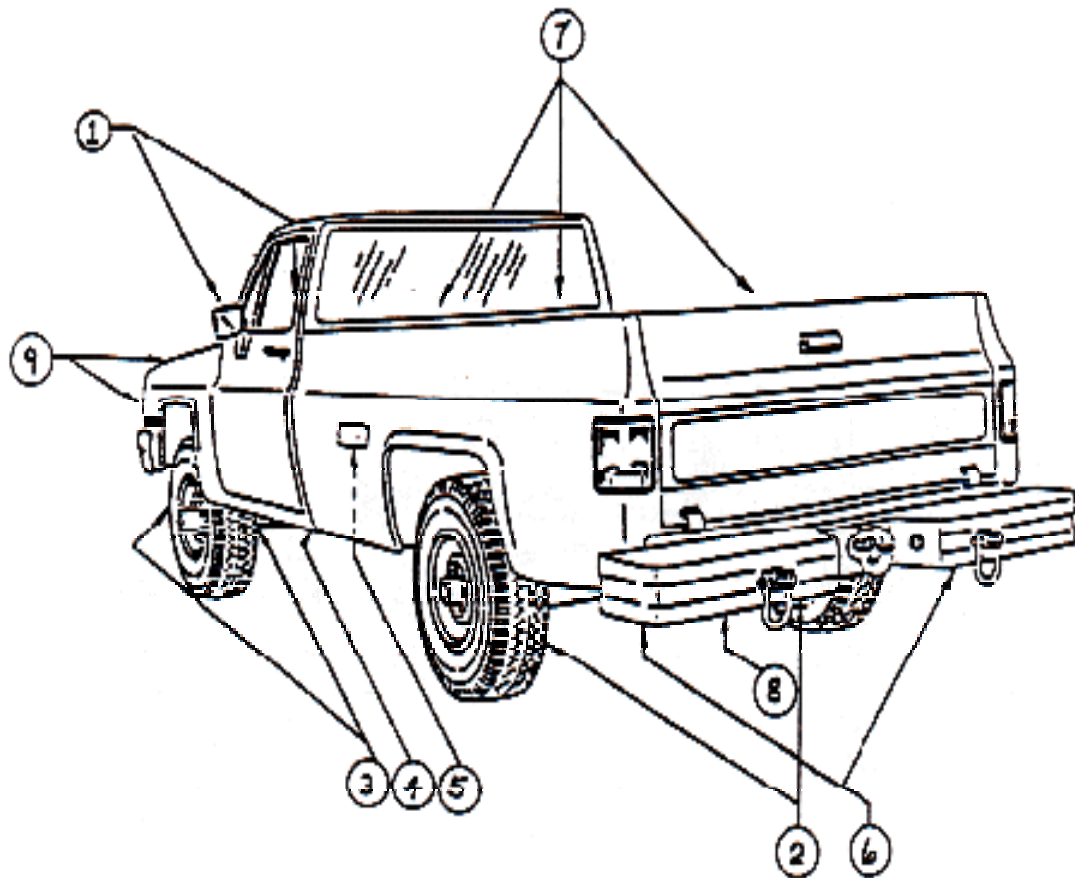
Interior cab (behind and under seats/door casing)





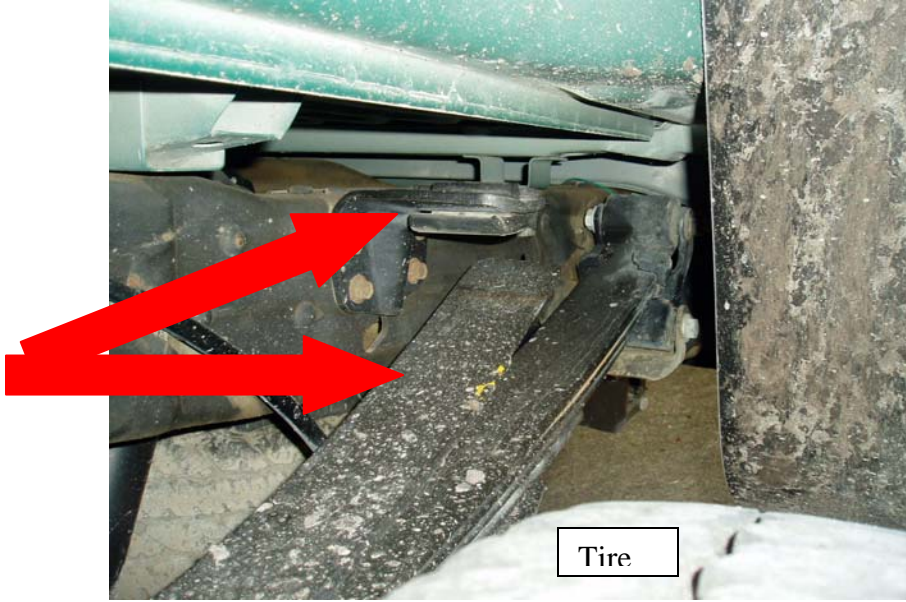
**PROBLEM AREAS**

1. Inside the cab, underneath the vehicle floor mat edge.
2. Underneath the seat.
3. On top of the rim of the spare tire.
4. The rear bed.
5. Ledges underneath bumpers, front and rear quarter panels.
6. Front of grill and tray under radiator.

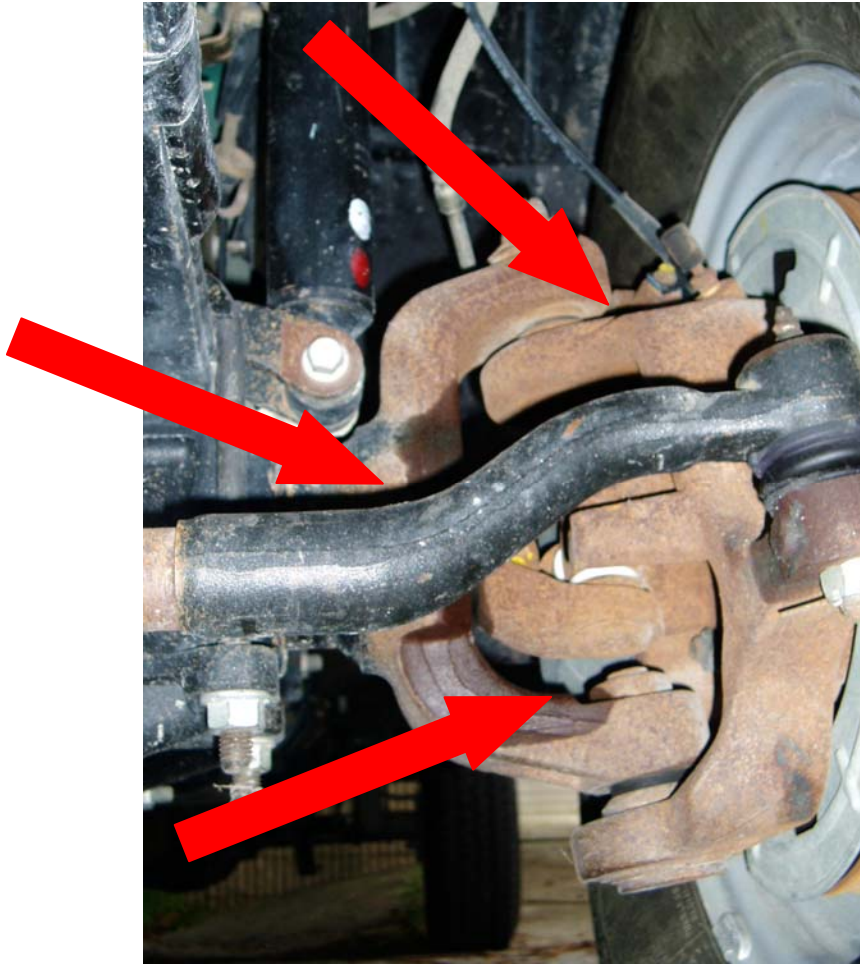


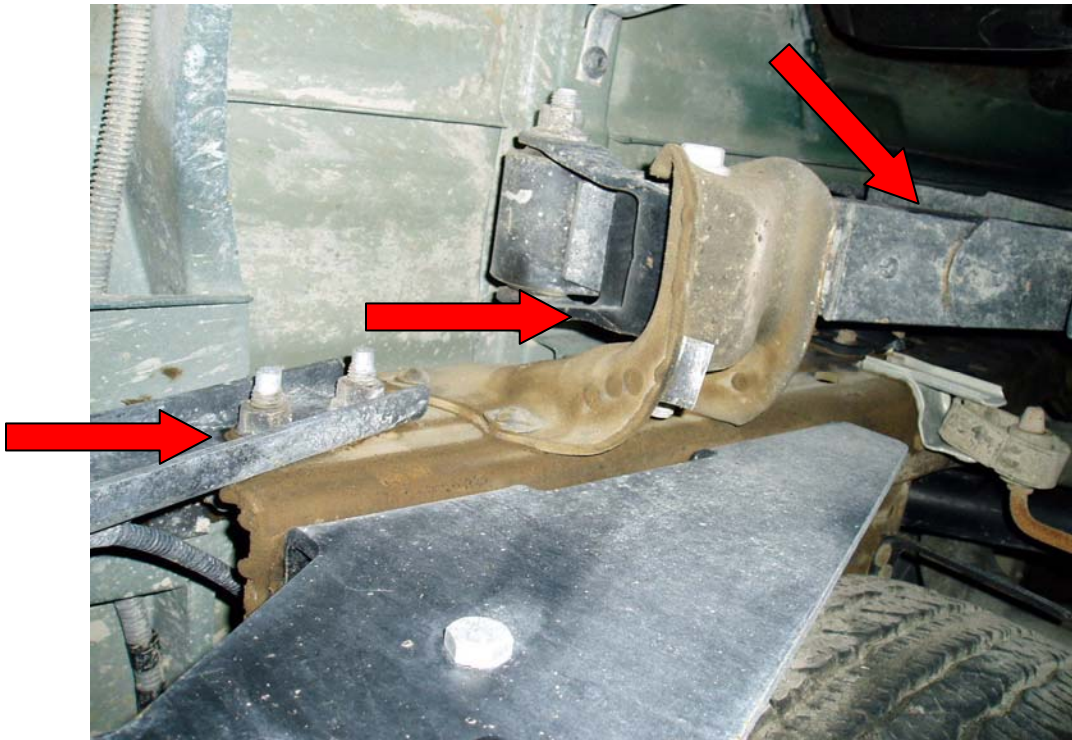
### PROBLEM AREAS

1. Twigs and/or debris in vent openings.
2. Between the rear wheel brake drums and the steel rim of the wheel.
3. On top of front suspension components.
4. On top of transmission.
5. On the fuel inlet tube, where it bends, just before it comes in contact with the body of the vehicle; view it from underneath.
6. Rear bumper area, especially behind the U-shaped protective plate that protects the wiring for the blackout lights.
7. Twigs and/or debris in bed of vehicle.
8. On top of the rim, of the spare tire.
9. Front area of grill.



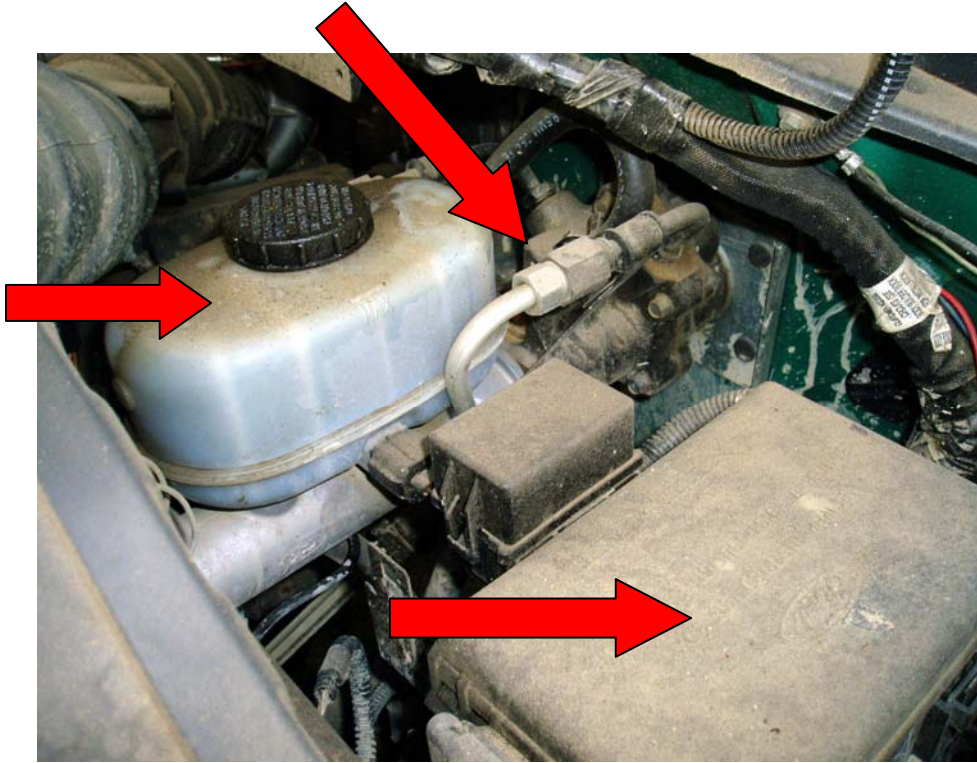
Wheel well of a pick-up





Wheel well/under carriage of pick-up

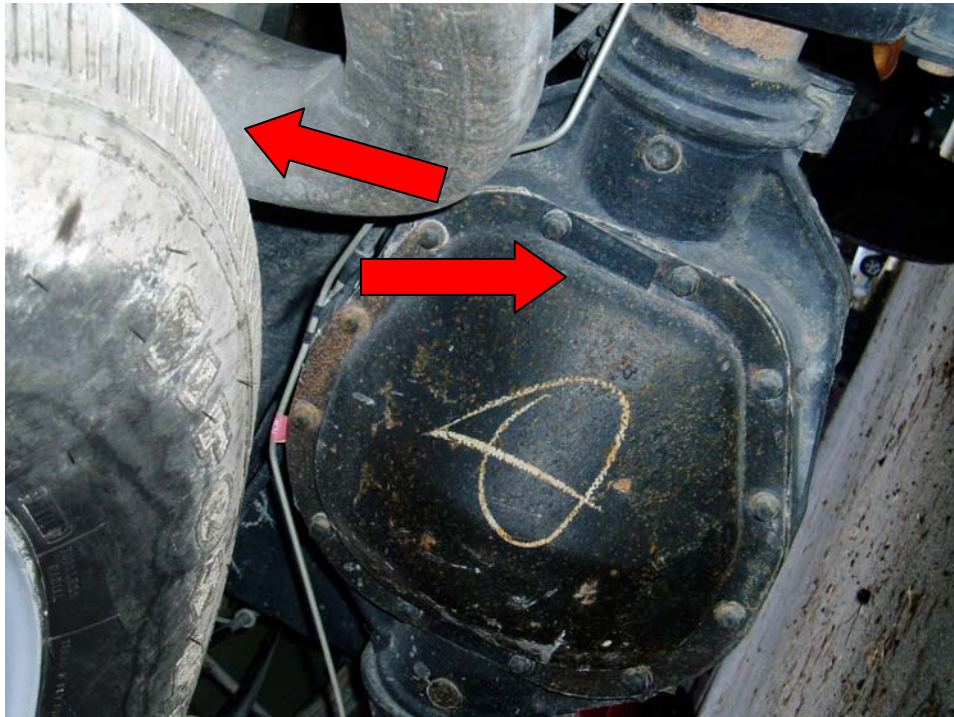




Engine compartment of pick-up







Transmission box (under carriage) and spare tire



Bed of truck

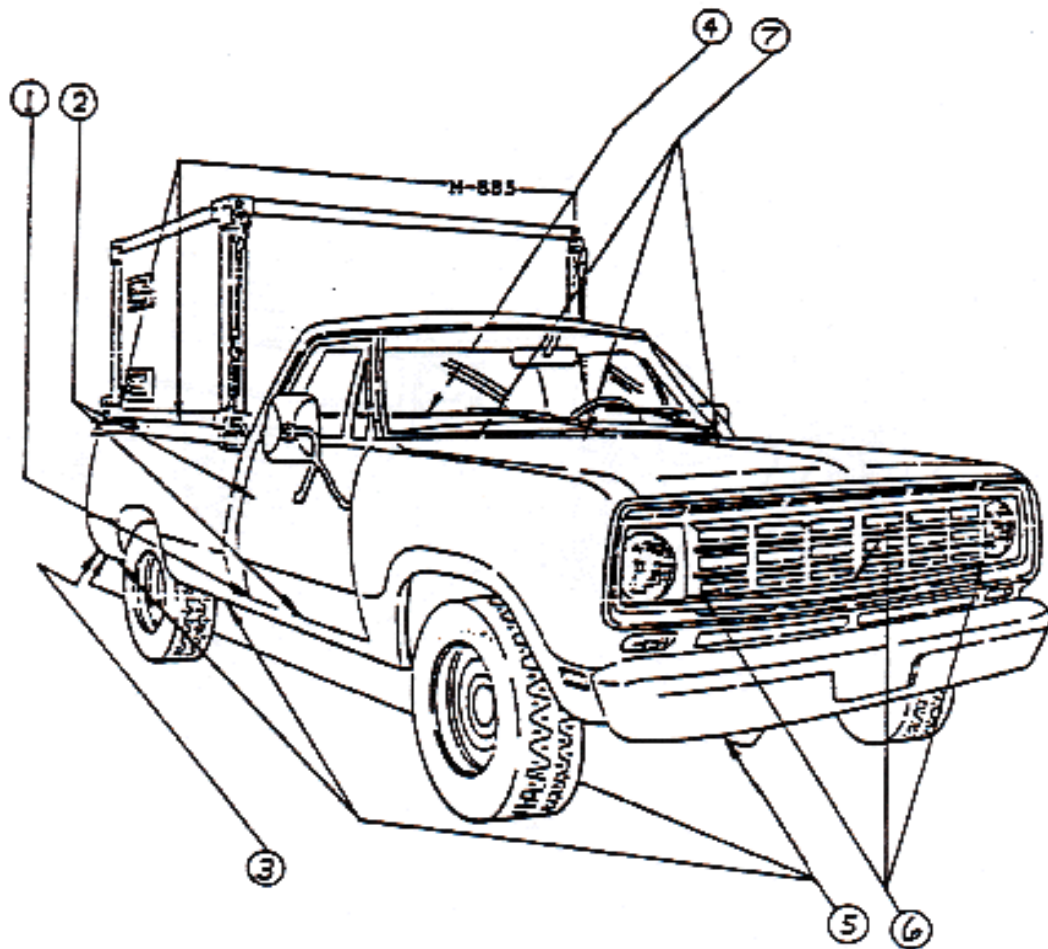


Area between cab and bed



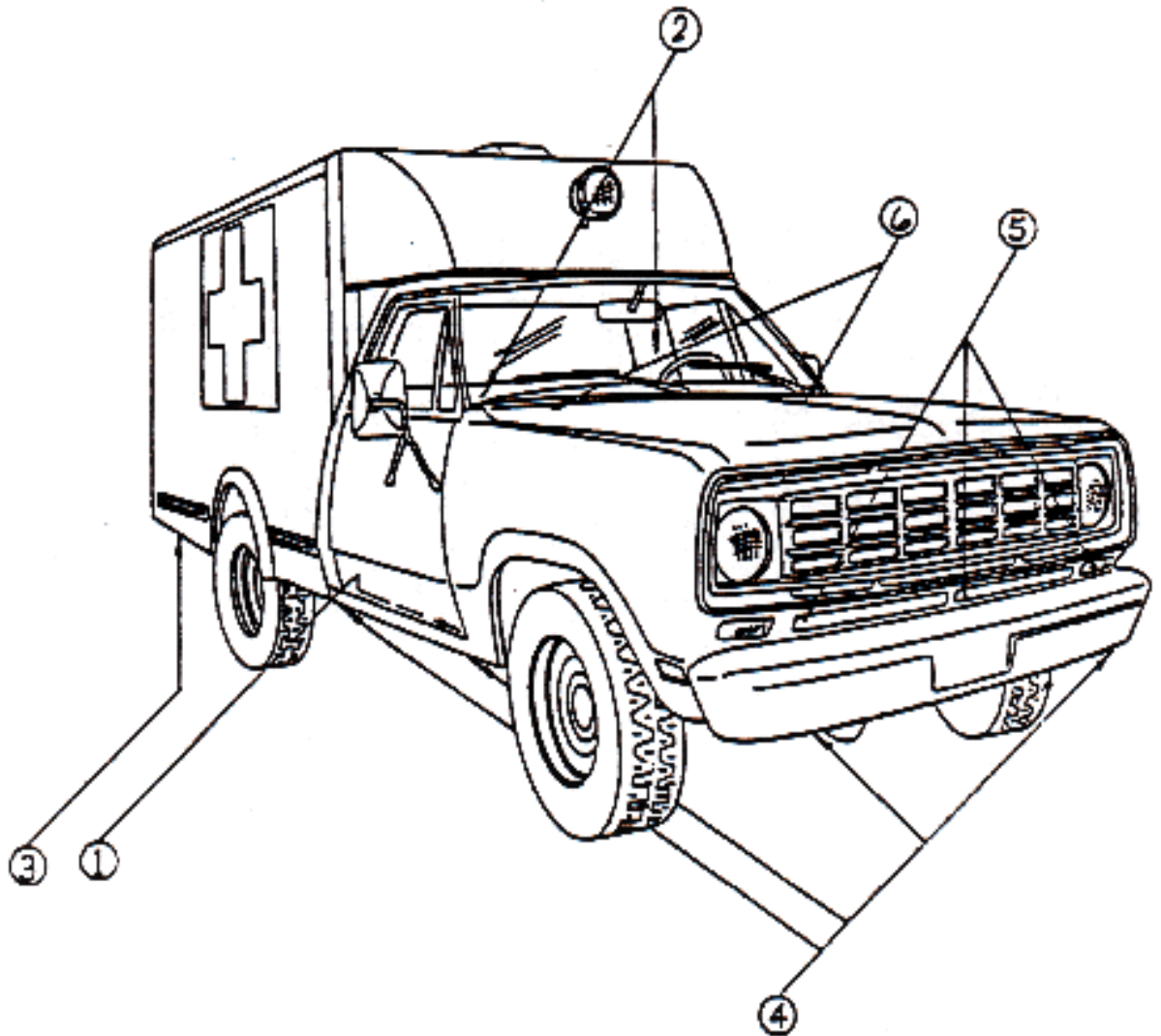
Area between tail gate and bed





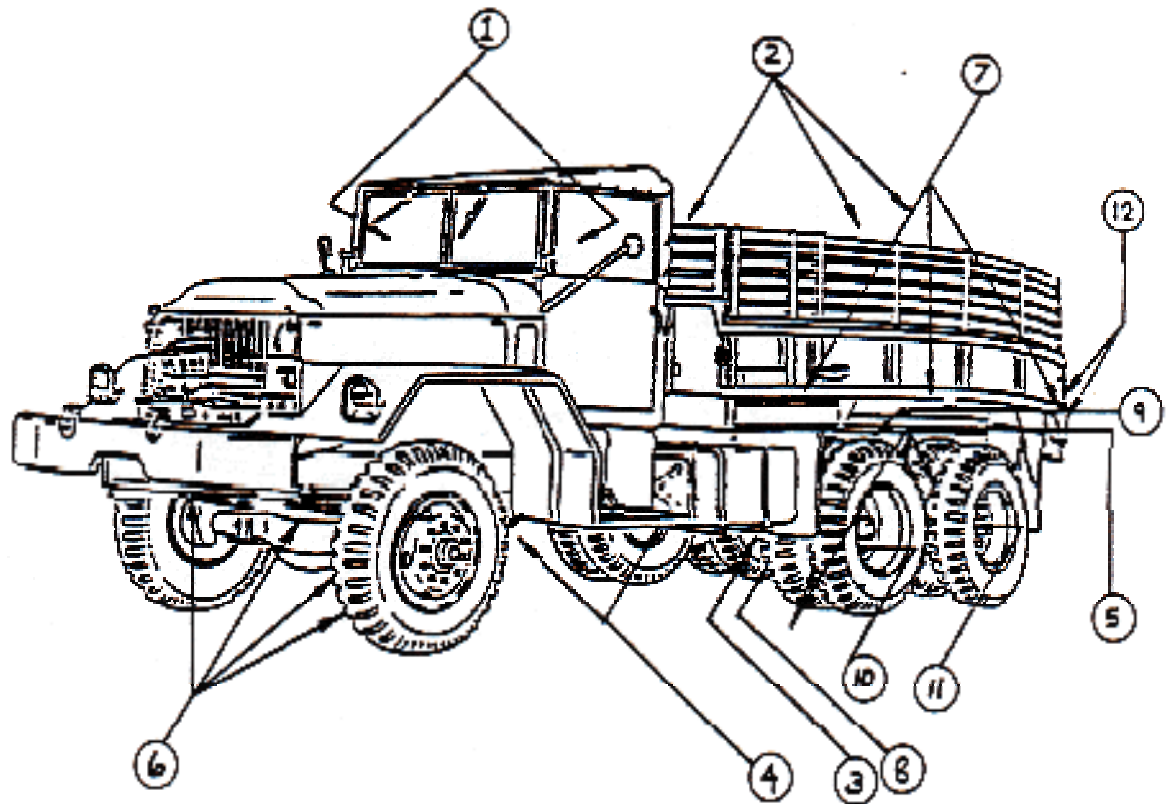
#### PROBLEM AREAS

1. Inside cab underneath edge of floor mats.
2. Underneath seat.
3. Spare tire mounting.
4. Underneath van and along the sides of the bed.
5. Ledges of the rear quarter panels, bumpers (front and rear).
6. Front Grill area and bottom of radiator.
7. Front Grill area and bottom of radiator.



#### PROBLEM AREAS

1. Inside the cab, underneath vehicle floor mat edge.
2. Underneath the seat.
3. On top of the rim of the spare tire.
4. Ledges underneath bumpers, front and rear quarter panels.
5. Front grill and tray under radiator.
6. Leaves and twigs in the vent openings.



**PROBLEM AREAS**

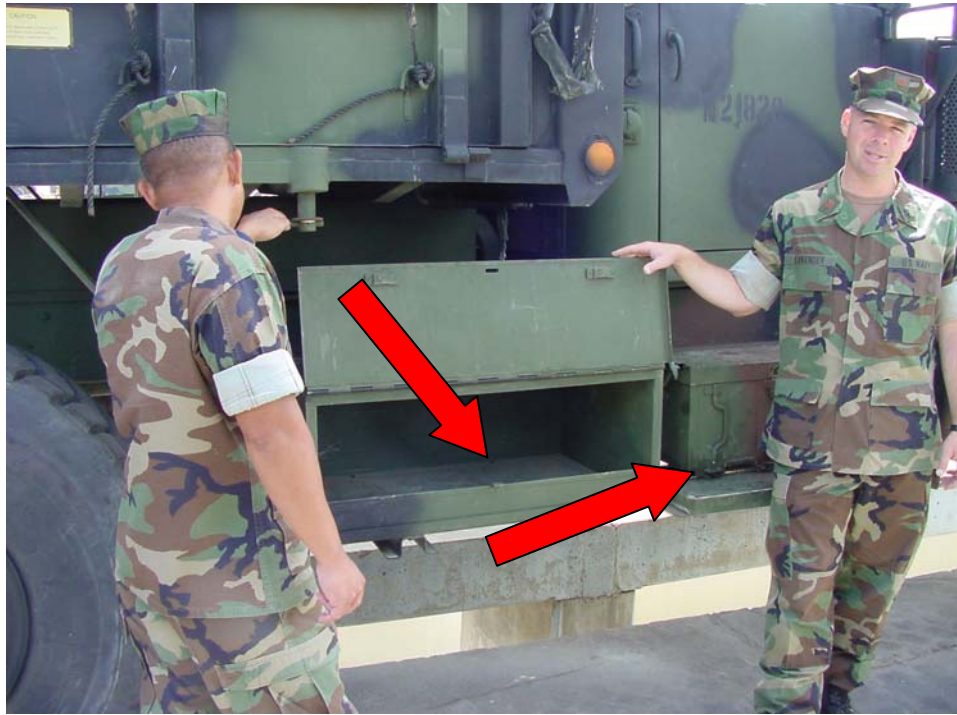
1. Under and behind both seats of cab.
2. Clean the floor of truck bed.
3. Between the brake drum and steel rim of wheel, of all rear wheels.
4. Underneath the platform for the OVM box and battery box.
5. Between the dual wheels, on the outer edge of the steel rim of each wheel.
6. On the ledges of the frame cross members.
7. On the ledges of the large channels which compose the main frame.
8. Drain plug of rear differential.
9. On top of leaf spring shackles
10. In the bracket between the rear wheels, from the outside.
11. In the bracket between the rear wheels, from the inside.
12. On the bottom ledge of the very rear cross member, and in the corners.



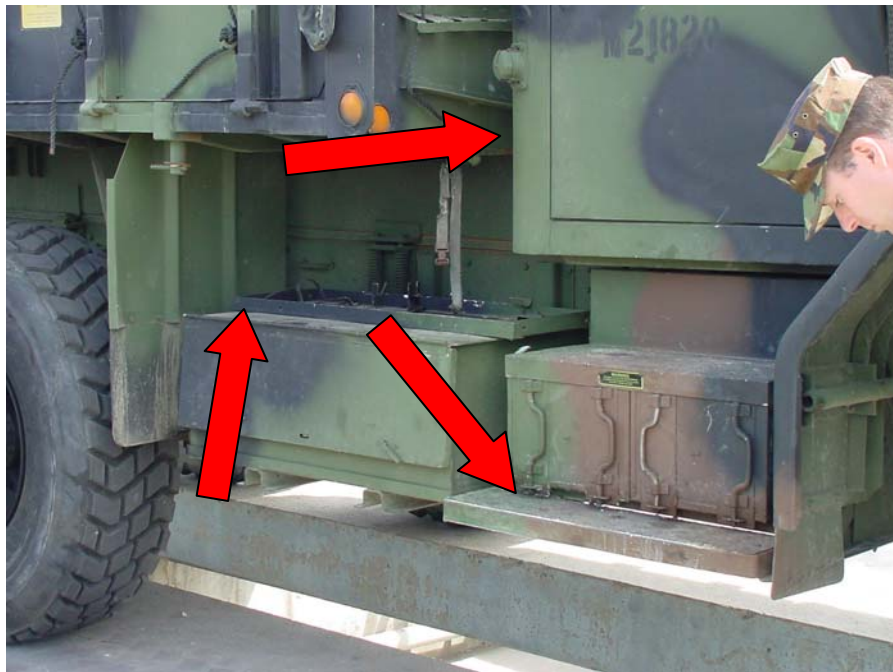
Five-ton on wash rack (note wheels blocked to prevent rolling)



Five-ton on wash rack



Tool box on five-ton. Area of concern for cleaning and inspection



All ledges and boxes should be checked for soil and debris



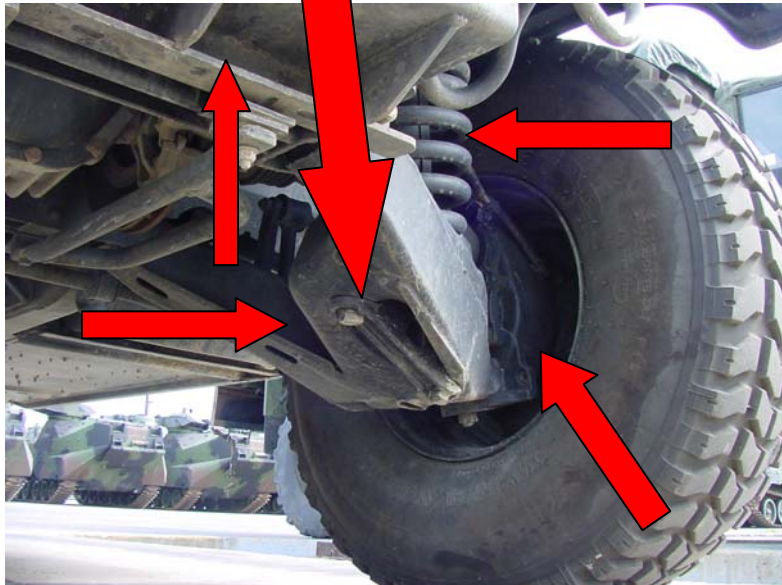


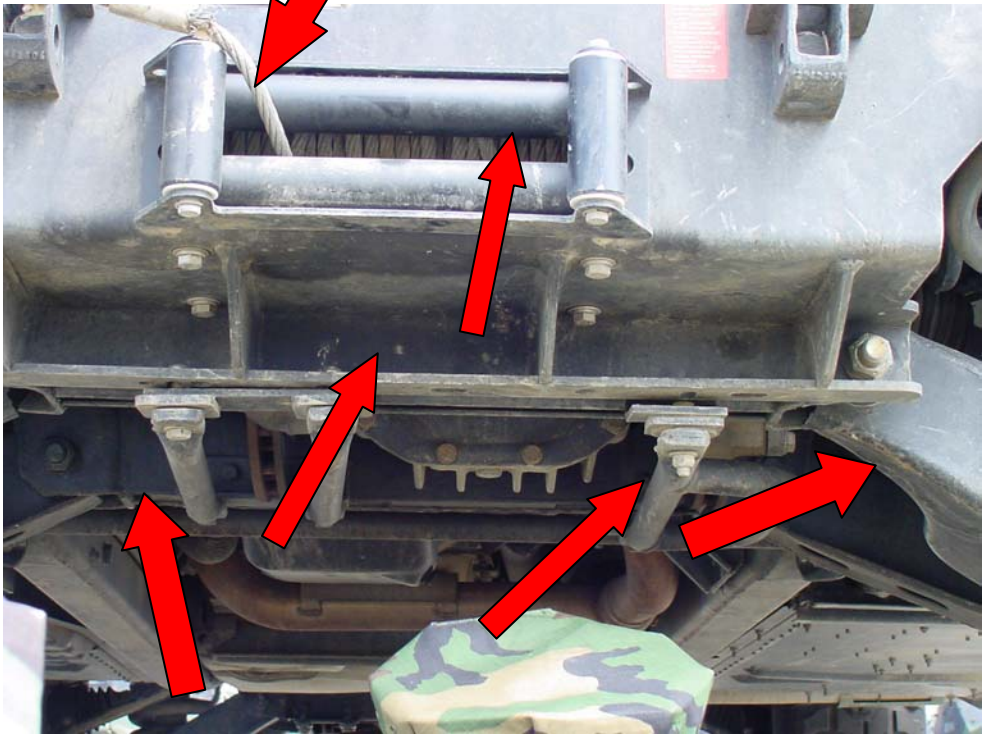
Undercarriage, axels, inside of wheels

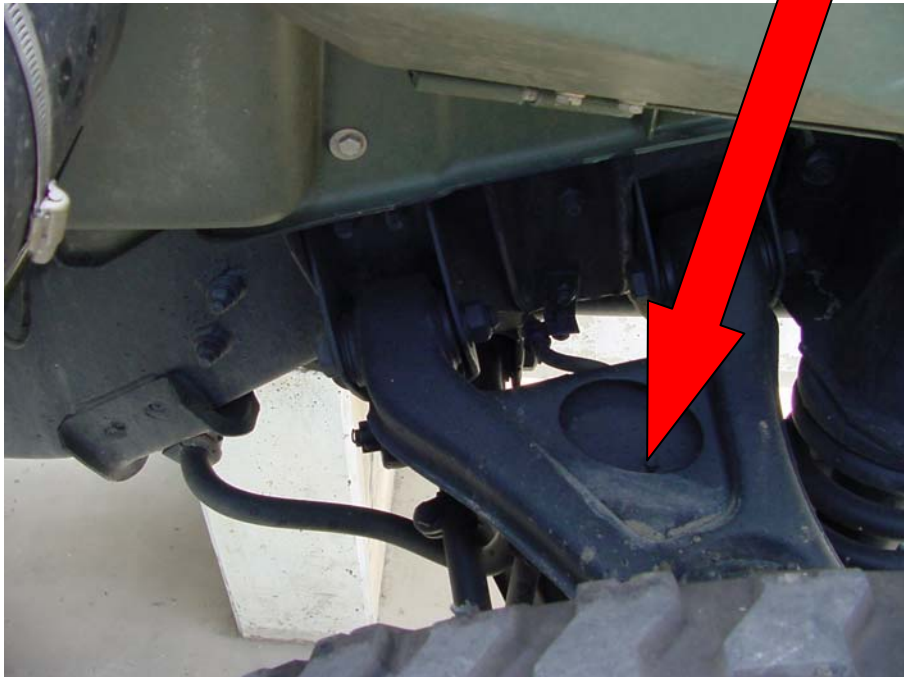
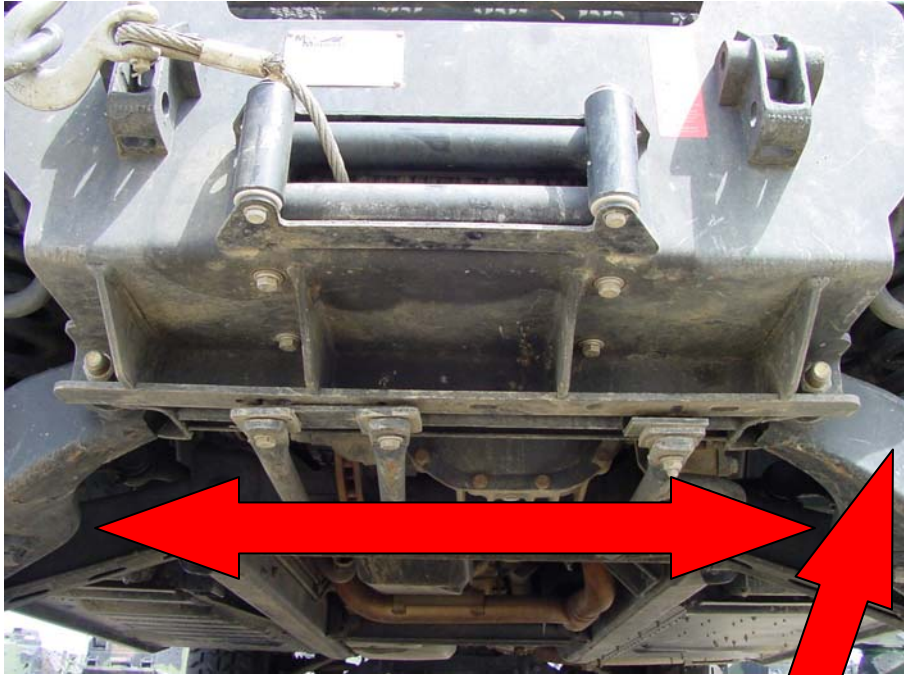






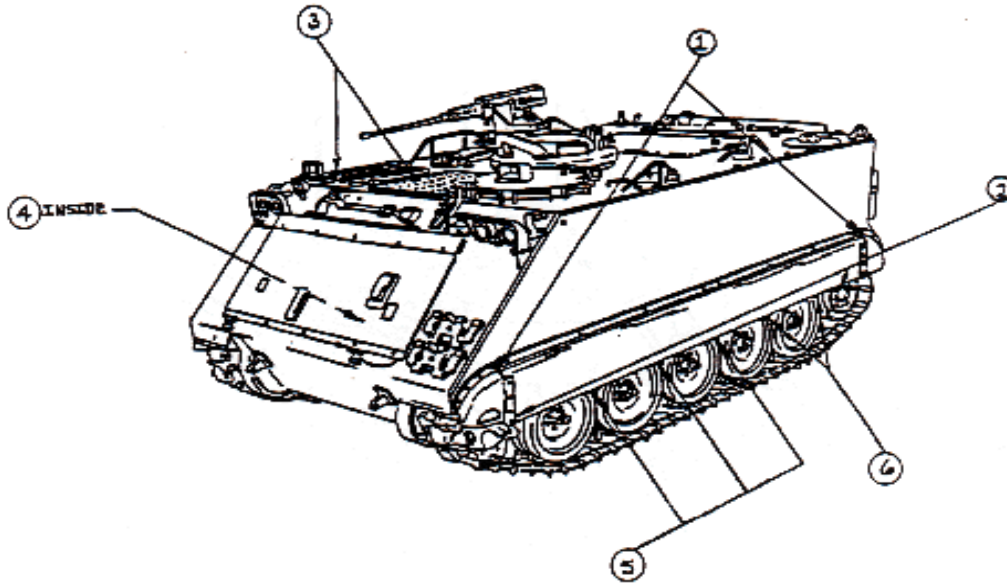








## TRACKED VEHICLES



### PROBLEM AREAS

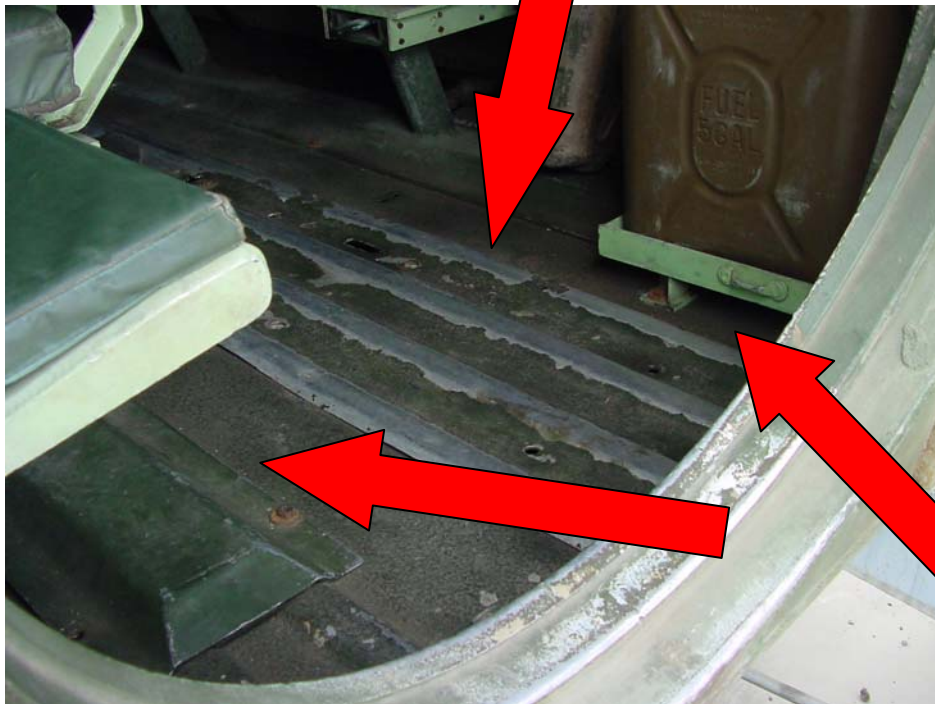
1. Inside the front and rear fenders, remove fenders for inspection.
2. On top of the track tensioners.
3. Remove twigs and debris from grills and surrounding areas.
4. Underneath all floor plates inside; remove and leave loose for inspection.
5. The inside edges of all road wheels; from underneath and from the outside also.
6. On top of all axles for the road wheels and end wheels.

NOTE: Tracks are a MAJOR PROBLEM, clean thoroughly.

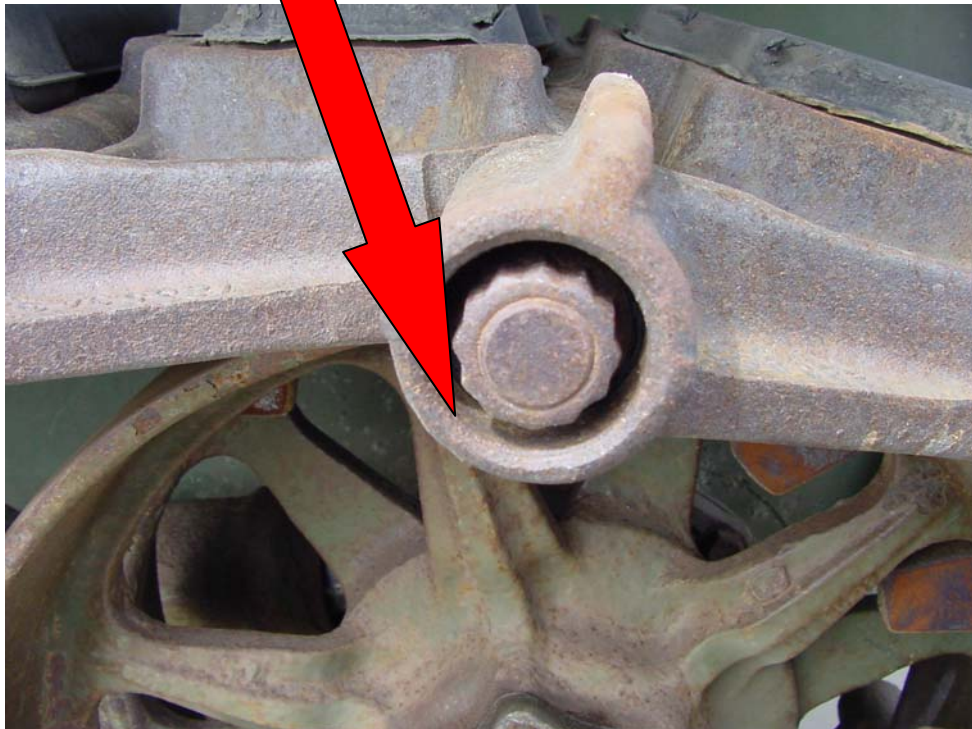


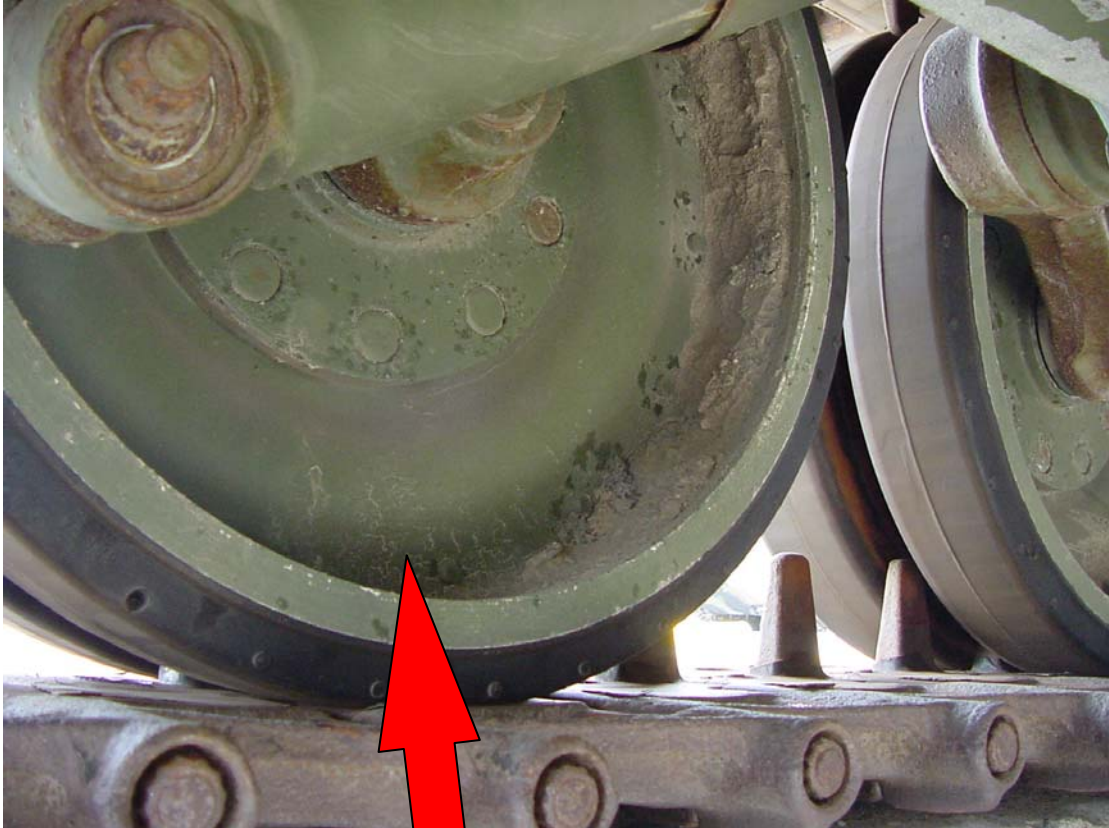


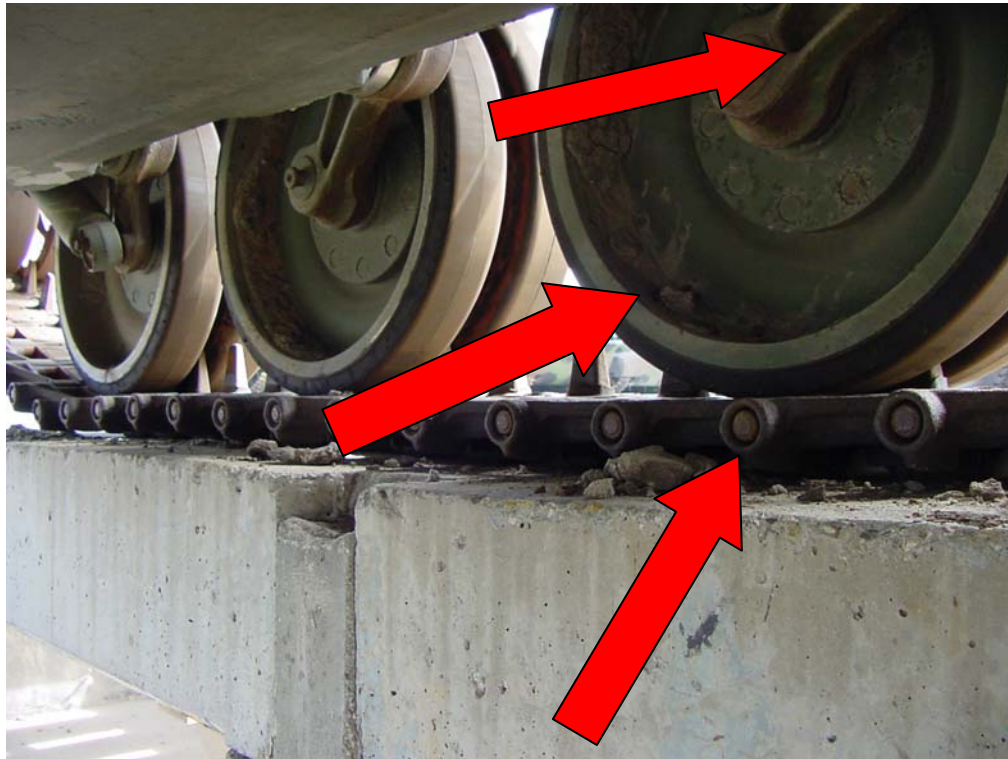
Amphibious Assault Vehicle (AAV) on wash rack

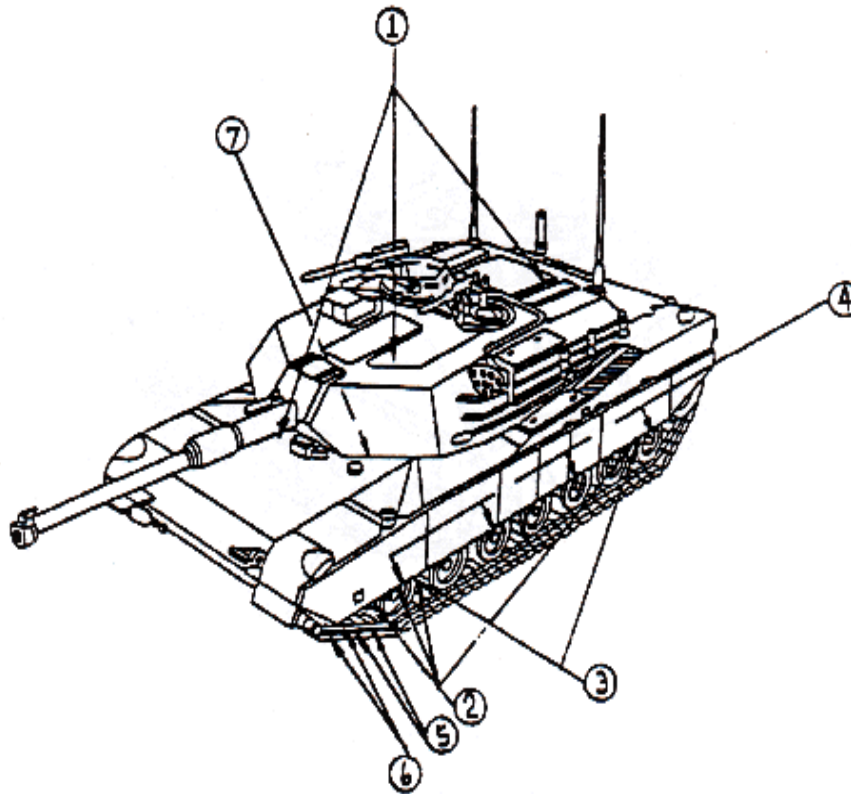


Inside AAV. Soil collecting on floor, under benches and support structures





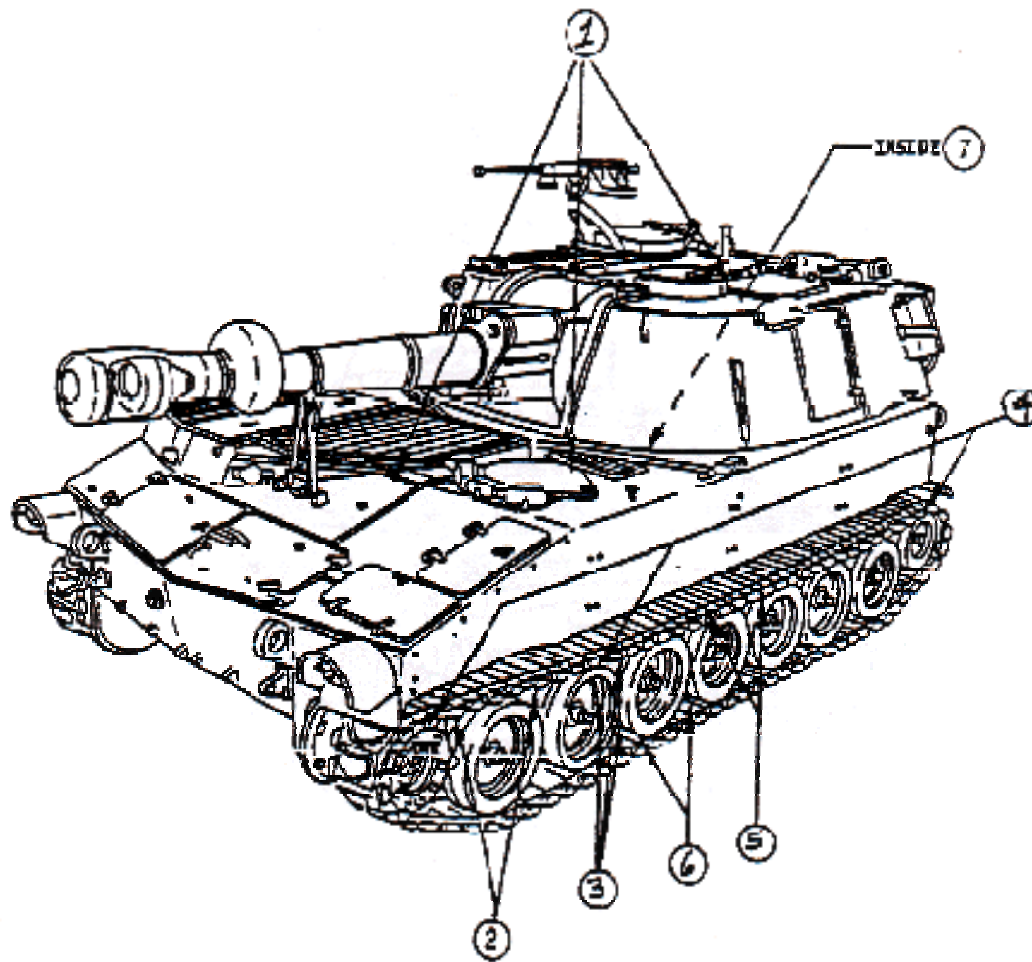




#### PROBLEM AREAS

1. Twigs and debris in the cracks and crevices of the top surfaces of the tank.
2. On top of the axles for both front and rear wheels.
3. On the inside of all road wheels and end wheels; from underneath and from the outside also.
4. On top of the axles for all road wheels, and on top of all tensioners.
5. On the support rollers, in the ledges, between the rubber surfaces.
6. On the support rollers, the inside surfaces; from the inside and outside.
7. Inside the tank, clean the floor, around the driver's footpedals.

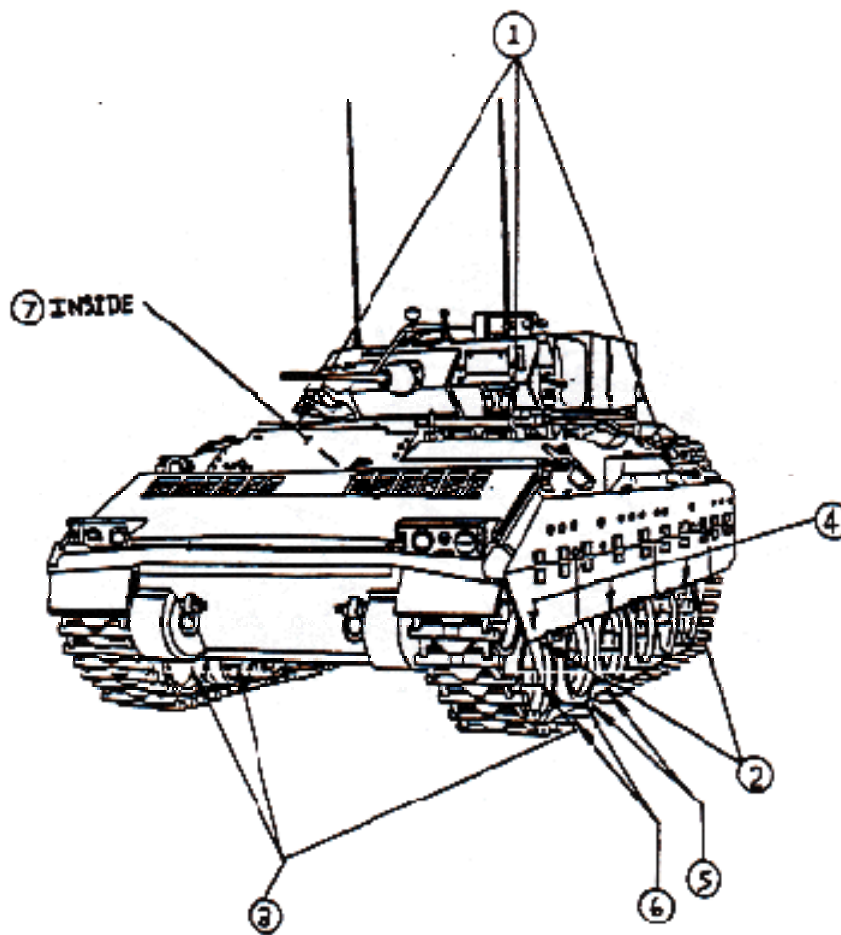
NOTE: Tracks are a MAJOR PROBLEM, clean thoroughly.



#### PROBLEM AREAS

1. Twigs and debris in the cracks and crevices of the top surfaces of the tank
2. On top of the axles for both front and rear wheels.
3. On the inside of all road wheels and end wheels; from underneath and from the outside also.
4. On top of the axles for all road wheels, and on top of all tensioners.
5. On the support rollers, in the ledges, between the rubber surfaces.
6. On the support rollers, the inside surfaces; from the inside and outside.
7. Inside the tank, clean the floor, around the driver's footpedals.

NOTE: Tracks are a MAJOR PROBLEM, clean thoroughly.



#### PROBLEM AREAS

1. Twigs and debris in the cracks and crevices of the top surfaces of the tank.
2. On top of the axles for both front and rear wheels.
3. On the inside of all road wheels and end wheels; from underneath and from the outside also.
4. On top of the axles for all road wheels, and on top of all tensioners.
5. On the support rollers, in the ledges, between the rubber surfaces.
6. On the support rollers, the inside surfaces; from the inside and outside.
7. Inside the tank, clean the floor, around the driver's footpedals.

NOTE: Tracks are a MAJOR PROBLEM, clean thoroughly.



## **APPENDIX D**

# **FLOW CHART OF TYPICAL OPERATIONAL WASHDOWN**

The order of tasks to be accomplished during a washdown should follow the pattern described below:

### **Remove detachable parts and mobile loads**

Clean

### **Top wash**

Prior to top wash, vacuum or compressed air clean interior of vehicle and remove trash

Clean all surfaces

Clean compartments

Clean engine

Clean passenger compartment

Clean vehicle bed

Clean areas between cab and beds

Clean radiator grills

### **Wash rack**

Clean all surfaces

Clean all wheel wells

Clean all ledges

Clean engine compartment

Universal joints

Support beams

### **Wet-Vac**

Remove all trash

Vacuum all passenger compartments

Vacuum all tool and cargo compartments

### **Inspect**

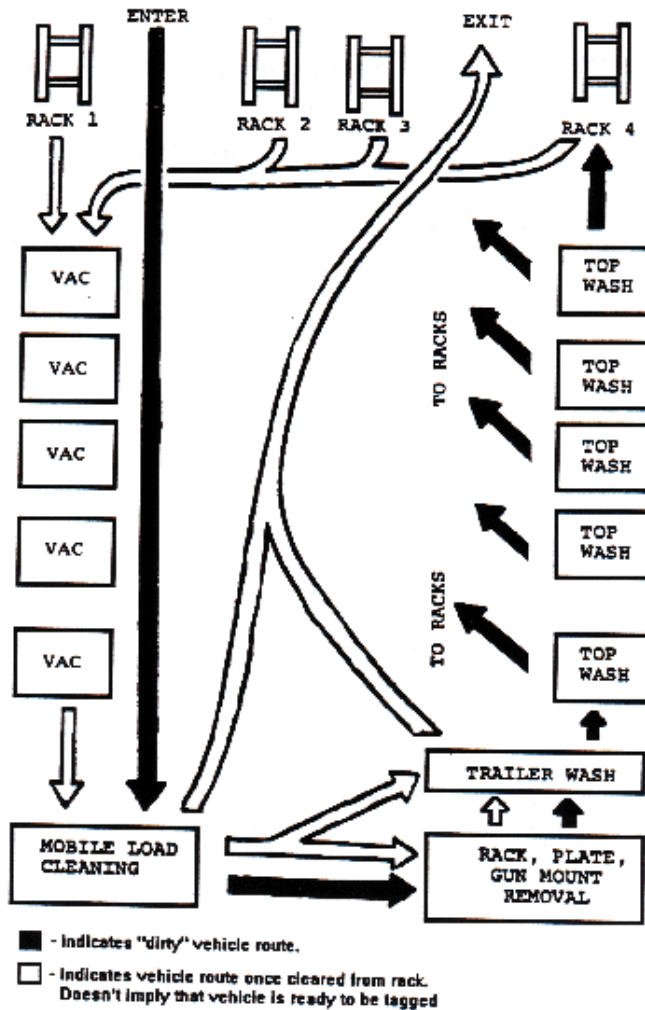
### **Reassemble**

### **Stage in Cleaning Area**

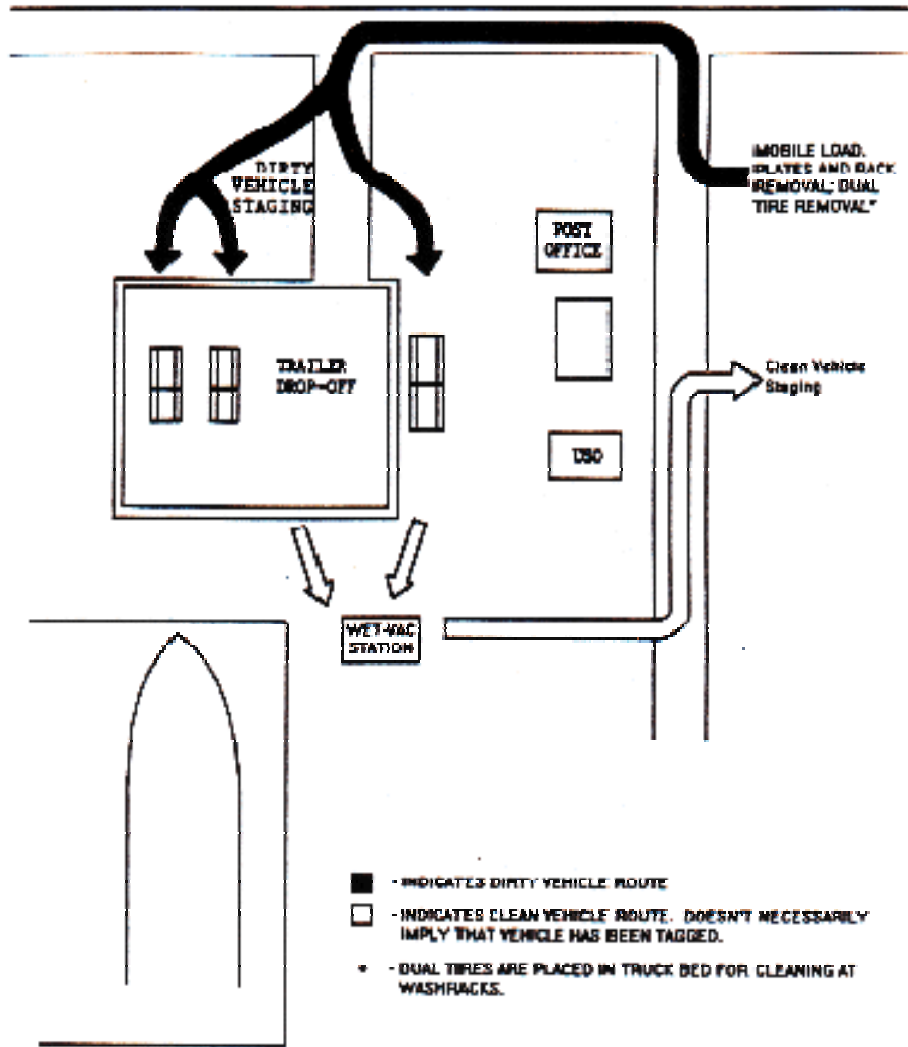
## TIPS

- Thoroughly brief personnel
- Use assembly line
- Most cleaning before wash racks
- Use several crews
- Use experienced personnel
- Have spare equipment
- Protect hoses
- Use PPE

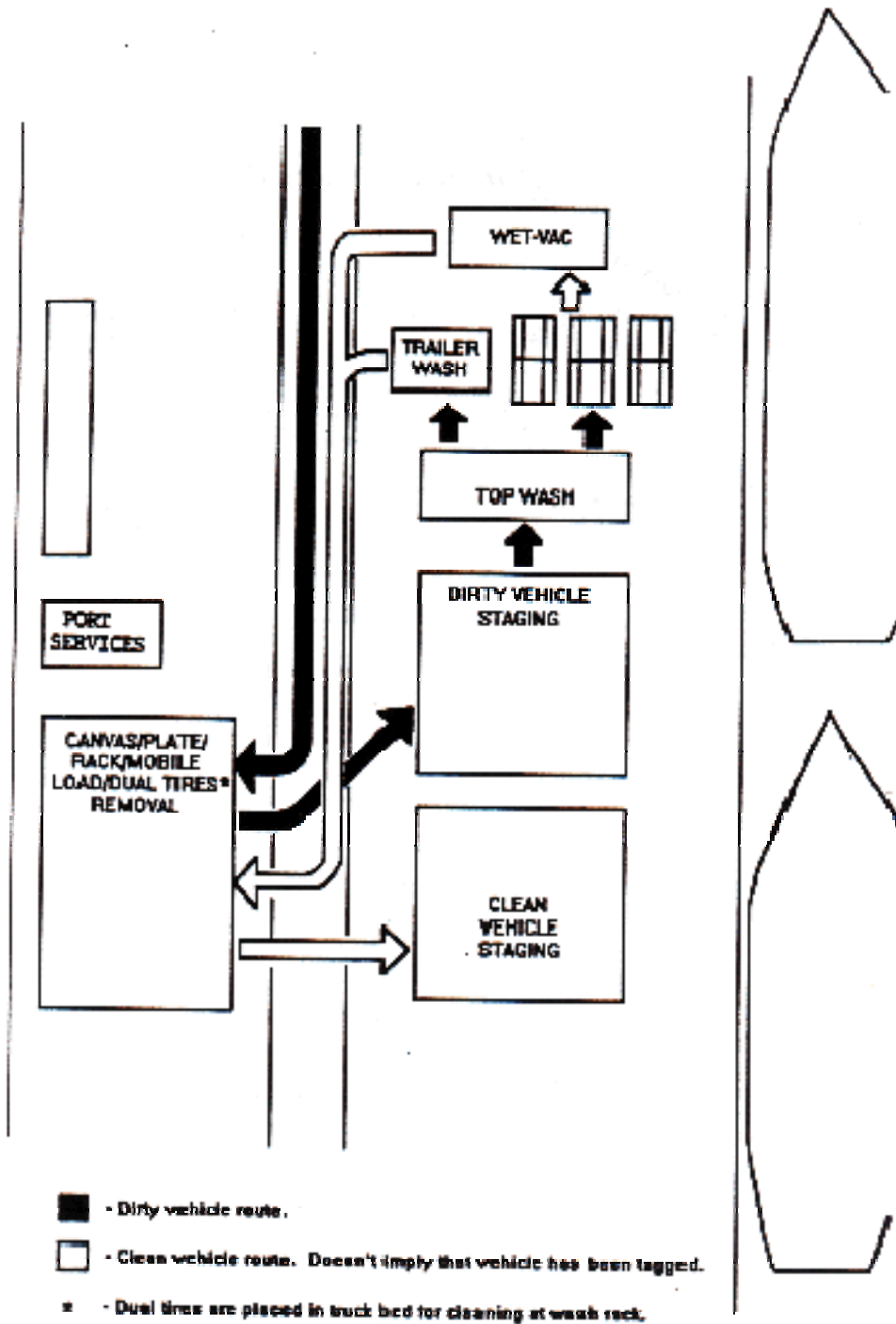
Washdown Flow Chart - Halfa, Israel



## Washdown Site - Roosevelt Roads, Puerto Rico



# Washdown Site - Rota, Spain





Example of a wash rack

## APPENDIX E

### SAMPLE VEHICLE TAG (WHITE OR MANILA)

<b>WASHDOWN CLEARANCE</b>	
<input type="radio"/>	VEHICLE #: X215792 TYPE: M998
DATE: 8 DEC 93	INITIALS: SG

Computer generated labels can be used if technology is available. Tie these tags where they will be readily seen. A rearview mirror is a standard.

<b>WASHDOWN CLEARANCE</b>	
<input type="radio"/>	VEHICLE #: X215792 TYPE: M998
DATE: 8 DEC 93	INITIALS: SG
DIRT IN WHEEL WELLS	

### VEHICLE TAG FOR FAILED INSPECTION (RED TAG)

Computer generated labels can be used if technology is available.

## APPENDIX F

### SAMPLE INSPECTION LOG BOOK ENTRY

#	Vehicle Type	Serial #	Date Inspected	Initials
105	HUMVEE	550370	20 OCT	RF
106	S-Ton	571269	20 OCT	RF
107	Jeep	632848	20 OCT	RF
108	Jeep	620968	20 OCT	RF
109	Jeep	604321	21 OCT	RF
110	P/K Truck	591681	21 OCT	RF
111	S-Ton	563002	21 OCT	RF
112	Jeep - <sup>NOT</sup> PASSED	551360	Remained on site	Inspect at COMS
113	LAST ENTRY			
114				
115				

Sample Entry

# APPENDIX G. SAMPLE LETTER FORMAT TO USDA OFFICIALS

DISEASE VECTOR ECOLOGY AND CONTROL CENTER  
NAVAL AIR STATION, BOX 43  
JACKSONVILLE, FL 32212

4 December 92

USDA APHIS/PPQ  
NC Maritime Bldg., Room 216  
113 Arendell Street, P.O. Box 53  
Morehead City, NC 28557

Dear Sir:

The following ships were inspected along with their amphibious craft, vehicles, tanks,  
and equipment:

USS WASP

USS

USS

All ships and their cargo are ready for CONUS arrival. The inspection was satisfactorily  
completed and we recommend approval for acceptance. I can be contacted at (904) 772-  
2424 should you desire any additional information.

R. J. Officer  
CDR MSC USN  
USDA ID NUMBER \_\_\_\_\_



**APPENDIX H**

**ADDRESSES OF USDA, CBP AND DOD OFFICES  
RESPONSIBLE FOR CLEARANCE  
AUTHORIZATION OR OTHER ASSISTANCE**

**Department of Agriculture**

**APHIS-PPQ Headquarters**

4700 River Road, Unit 60  
Riverdale, Maryland 20737  
Telephone number: (301) 734-8295  
FAX: (301) 734-5269/8318

**Foot and Mouth Disease/Foreign Animal Disease Related Questions/Issues**

Bob Weir, DVM  
Email: Robert.D.Weir@usda.gov  
Telephone: (301) 734-7633  
FAX: (301) 734-8538

**Preclearance Requests**

Stanley Cornelius  
Email: Stanley.Cornelius@usda.gov

**APHIS Preclearance Program Questions**

Paul McGown  
Email: Paul.G.Mcgowan@usda.gov

**US Port Arrival Policy Questions**

Candace Funk  
Email: Candace.G.Funk@usda.gov

**Department of Homeland Security: US Customs and Border Protection**

**CBP Headquarters**

Director, Preclearance Operations  
1300 Pennsylvania Ave, Northwest  
Room 5.5B  
Washington, DC 20229  
Phone: 202-927-1439

**Department of Home Security: US Customs and Border Protection CONUS Field Operations Offices**

**Atlanta**

Field Operations Office Information  
1699 Phoenix Parkway  
Suite 400  
College Park, GA 30349  
Mailing Address: Same As Above  
Phone: (678) 284-5900  
FAX: (678) 284-5932  
Operational Hours: 8:00 AM-5:00 PM (Eastern)  
Weekdays (Monday-Friday)

**Baltimore**

Field Operations Office Information  
103 South Gay Street  
Suite 715  
Baltimore, MD 21202  
Mailing Address: Same As Above  
Phone: (410) 962-6200  
FAX: (410) 962-2423  
Operational Hours: 8:00 AM-5:00 PM (Eastern)  
Weekdays (Monday-Friday)

**Boston**

Field Operations Office Information  
10 Causeway St  
Room 801  
Boston, MA 02222  
Mailing Address: Same As Above  
Phone: (617) 565-6208  
FAX: (617) 565-6277  
Operational Hours: 8:00 AM-5:00 PM (Eastern)  
Weekdays (Monday-Friday)

**Buffalo**

Field Operations Office Information  
4455 Genesee Street  
Buffalo, NY 14225  
Mailing Address: Same As Above  
Phone: (716) 626-0400  
FAX: (716) 626-1164

Operational Hours: 8:00 AM-5:00 PM (Eastern)  
Weekdays (Monday-Friday)

**Chicago**

Field Operations Office Information  
610 S. Canal Street  
Room 900  
Chicago, IL 60607  
Mailing Address: Same As Above  
Phone: (312) 983-9100  
FAX: (312) 886-4921  
Operational Hours: 8:00 AM-5:00 PM (Central)  
Weekdays (Monday-Friday)

**Detroit**

Field Operations Office Information  
211 West Fort Street, Suite 1200  
Detroit, MI 48226  
Mailing Address: Same As Above  
Phone: (313) 496-2155  
FAX: (313) 226-6066  
Operational Hours: 8:00 AM-5:00 PM (Eastern)  
Weekdays (Monday-Friday)

**El Paso**

Field Operations Office Information  
9400 Viscount Suite 104  
El Paso, TX 79925  
Mailing Address: Same As Above  
Phone: (915) 633-7300  
FAX: (915) 633-7345  
Operational Hours: 8:30 AM-5:00 PM (Mountain)  
Weekdays (Monday-Friday)

**Houston**

Field Operations Office Information  
2323 S. Shepherd #1200  
Houston, TX 77019  
Mailing Address: Same As Above  
Phone: (713) 387-7200  
FAX: (713) 387-7212  
Operational Hours: 8:30 AM-5:00 PM (Central)  
Weekdays (Monday-Friday)

**Laredo**

Field Operations Office Information

109 Shiloh Dr., Suite 300  
Laredo, TX 78045  
Mailing Address : Same As Above  
Phone: (956) 753-1700  
FAX: (956) 753-1754  
Operational Hours: 8:00 AM-5:00 PM (Central)  
Weekdays (Monday-Friday)

**Los Angeles**

Field Operations Office Information  
1 World Trade Center  
Suite 705  
Long Beach, CA 90831  
Mailing Address: Same As Above  
Phone: (562) 980-3100  
FAX: (562) 980-3107  
Operational Hours: 8:00 AM-4:30 PM (Pacific)  
Weekdays (Monday-Friday)

**Miami**

Field Operations Office Information  
909 S.E. 1st Avenue  
Suite 980  
Miami, FL 33131  
Mailing Address: Same As Above  
Phone: (305) 810-5120  
FAX: (305) 810-5143  
Operational Hours: 8:00 AM-5:00 PM (Eastern)  
Weekdays (Monday-Friday)

**New Orleans**

Field Operations Office Information  
1515 Poydras Street  
Room 880  
New Orleans, LA 70112  
Mailing Address: Same  
Phone: (504) 670-2404  
FAX: (504) 670-2286  
Operational Hours : 8:00 AM-5:00 PM (Central)  
Weekdays (Monday-Friday)

**New York**

Field Operations Office Information  
One Penn Plaza  
11th Floor  
New York, NY 10119  
Mailing Address: Same As Above  
Phone: (646) 733-3100  
FAX: (646) 733-3245  
Operational Hours: 8:00 AM-4:30 PM (Eastern)  
Weekdays (Monday-Friday)

**Portland**

\*Field Operations Office Information  
33 New Montgomery Street, Suite 1601  
Suite 1601  
San Francisco, CA 94105  
Mailing Address: Same As Above  
General Phone: (415) 744-1530  
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\*Portland office is managed out of the San Francisco Field Office

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## **APPENDIX I: LAND SNAILS**

The following outlines methods and procedures to be used by Department of Defense personnel located in overseas areas to prevent contamination of materials with land snails. In addition, this memorandum provides guidelines for decontamination of cargo both prior to shipment and after arrival.

### **Prevention of snail entry and establishment**

1. Supplies and retrograde cargo which have not received adequate inspection and are subsequently shipped to CONUS ports of entry may be the source of serious problems, if applicable quarantine procedures are not rigidly observed. Some examples are given below:

A. A few contaminated items, intermixed with snail-free cargo loaded on a vessel, may require fumigation of the vessel and entire cargo even if some portions were fumigated prior to landing. This intermixing has been particularly troublesome when shipments originate at different locations, and it may be impossible to establish responsibility for the contamination and to prorate decontamination costs among the shippers on an equitable basis.

B. Initial cargo inspection prior to loading aboard ships or aircraft may not always reveal the presence of snails. If contamination is discovered after cargo is unloaded, it may have to be reloaded aboard ship for fumigation if adequate facilities are not available ashore, or if adverse weather conditions preclude an effective treatment on an exposed dock area.

C. The risk of pest introduction is elevated when contaminated cargo is discharged on docks or at military installations CONUS. Many installations are not generally staffed or equipped to decontaminate snail-infested cargo, and the risk of introduction is magnified with delays in arranging for fumigation by commercial pest control operators. Snails, which became established in Florida and California, have presented a very serious threat to the agricultural industry in those states in addition to the expense of the control/eradication measures taken.

D. Decontamination at ports of entry, particularly of surface-borne cargo, has been expensive. Fumigation charges may exceed \$40,000 per ship. In addition, there has been considerable delay in the movement of high priority cargo resulting from fumigation.

E. Current directives prohibit the fumigation of ammunition aboard ship at CONUS- ports. Therefore, special precautions must be taken through arrangements between the originators and the carrier of the shipment to assure that all ammunition shipments are snail-free.

F. The shipment of contaminated cargo to locations in friendly countries where the destructive snails are not known to occur could have serious consequences if the United States were held responsible for introducing the pests and for the costs

of their eradication. The spread of these snails to other areas would compound the present problems which for the most part have been confined to cargo from the Mediterranean area.

### **General military operational considerations**

1. The problem of agricultural pests associated with retrograde military cargo is not entirely new in the history of Department of Defense overseas support operations. There will be no relief from the risks of pest introduction, and the expense and delay of decontamination, as long as this country has military forces in these areas, unless proper attention is devoted to implementing preventive control procedures at the source.

2. In order to prevent the dissemination of pest snails it is necessary to use three control phases simultaneously as follows:

A. **Prevention Phase** - to protect supplies from becoming infested while in storage or awaiting shipment. This protection should include thorough and complete surveillance by appropriate personnel prior to loading.

B. **Correction Phase** - designed and implemented by engineer-entomologist services to reduce and/or eliminate local snail populations by chemical and physical means.

C. **Decontamination Phase** - to decontaminate infested materials that are to be returned CONUS or shipped to other military bases and locations in overseas areas.

2. As preventive and corrective control programs are implemented, and their effectiveness increases, the need for decontamination should be reduced.

3. The snail control and decontamination procedures presented here are based upon experience and research, in both field and laboratory studies. Therefore, the methods and procedures outlined should not be modified unless prior approval has been obtained from the area, district, or command entomologist and appropriate U. S. Department of Agriculture APHIS representative.

### **Supply storage**

General: The most important phase in the movement of snail-free cargo is that of utilizing good storage practices and techniques to prevent infestation. The following procedures should be incorporated into a preventive control program:

1. Store supplies awaiting shipment in warehouses. Land snails do not normally enter buildings to aestivate, therefore, enclosed structures provide the greatest protection against infestation
2. If warehouses are unavailable, use paved open storage and an aggressive snail control program. Areas covered with asphalt or concrete provide the most suitable and lasting types of ground cover for storage areas, and less maintenance will be required.
3. If neither warehousing nor paved areas are available for supply storage, suitable storage must be constructed. A layer of well-compacted, crushed stone about 6 inches deep should be laid on the soil, the depth depending on the soil conditions. Placing such an impermeable barrier over the soil will eliminate food resources and break an important link in the reproductive cycle of the snail. Remove the vegetation and top soil from a strip, 20 to 25 feet wide, around the perimeter of this area and apply a soil sterilant to prevent growth of vegetation. This type of site can also be used for decontamination prior to shipment CONUS or other snail-free military locations.
4. Permit only snail-free supplies in warehouses or snail-free storage areas. Do not mix infested cargo with snail-free cargo in storage or in transit.
5. Store transport containers when not in use, in snail-free areas to prevent infestation. CONEX containers have been a major source of snail interceptions at the ports of entry in the past. Shipping containers, including those for household goods, must not be stored or allowed to remain on the open ground. Cargoes or household effects infested with snails should never be packed in containers for shipment.

### **Cargo movement and transportation of supplies**

General: Snail-free retrograde cargo and household effects can be satisfactorily moved from snail-infested areas to CONUS and to other overseas locations, provided good judgment is followed in selection of storage, meticulous pre-inspections are performed and when necessary, effective snail control and fumigation are conducted. These factors must be strictly observed and enforced at the points of origin and embarkation.

Inspection for Snails: It is vital to prohibit the movement of snail containing cargo into any area unless that species of snail is already established in that area. This is particularly applicable in movement of cargo from country-to-country, between non-contiguous land masses, and from off-shore island(s) to mainland port cities. A thorough inspection should be made of all military materials and personal household effects of military and civilian personnel prior to movement from a known snail area to any snail-free destination. Because of the tendency of snails to hide in crevices or to crawl into holes or

other openings, it will be necessary to inspect the interior, as well as the exterior of containers, when potential snail entry holes are noted. The smaller snails resemble ordinary pebbles in color and markings as well as size; therefore, a significant infestation could be overlooked during a superficial inspection of contaminated articles.

Occasionally, the presence of snails may be indicated by a faint slime trail. Shipping containers boxes, particularly when they have been in contact with the soil, offer a number of havens for snails -- the bottom runners (some of which are hollow), the lift hook slots, and the occasional rust holes in the more weathered boxes. All sides of each likely item must be closely examined, noting in particular any cracks, crevices, or other areas not readily observable. Fork lifts will frequently be required for inspection of bottoms of boxes, crates, and the heavier articles. Steel cylinders present good hiding places - under the screw cap and adhering to the pallets to which cylinders are often fastened. Pipes of all types are especially attractive to snails since caps or plugs are seldom feasible. In the case of tracked vehicles, cranes, and other heavy equipment, with so many crevices in which snails can hide, steam or water-jet cleaning is recommended in lieu of or in addition to examination. To prevent the contamination of military or commercial cargo carriers during the movement of supplies from one location to another, only snail-free cargo should be shipped. In the examination of ships before loading, attention should be given to the bottoms of holds and ledges around the sides. Hold bulkheads near the engine room, being warmer, are favored snail sites. **Snail-free cargo should never be loaded until holds have been thoroughly inspected and found or made snail free.**

#### U.S. port of entry inspection by Plant Protection and Quarantine

At the U.S. Port of Entry, items which could harbor snails will be subject to inspection by Customs and Border Protection (CBP)/Agricultural Inspectors. Standard documents such as vessel or aircraft manifests, general declarations or cargo load plans should be presented to CBP upon arrival at the first U.S. Port of Arrival and/or discharge. These documents will be used by CBP to determine if inspection is required for military cargo or containers transporting military cargo. Generally, CBP examines containers and military cargo originating from certain high risk snail areas of the world such as the Mediterranean and Pacific basin. If quarantine significant snails are found, CBP may refuse entry to the cargo or require the item be fumigated by USDA APHIS to kill the snail pests.

#### Other factors involving cargo movement:

- Equipment (forklifts, tractor-trailers, trucks, and railcars) and materials (pallets, dunnage, and tarpaulins) utilized in the storage and transportation of non-infested supplies must be snail-free. This equipment, when not in use, should be returned to snail-free areas. Equipment that is utilized to handle or transport snail-infested supplies should not be reused unless the equipment has been decontaminated
- It is important that adequate procedures be established to prevent snail "stowaways" in personal household effects of military personnel. Shipment boxes



used for household goods should not be placed on the ground. Lawn furniture, garden hoses and tools, sporting goods (boats, motors, etc.) bicycles, motor scooters, utility trailers, tires, and other items that are allowed to remain outdoors must be decontaminated before packing for shipment from snail-infested areas

- Household furniture and packing materials should never be placed on the ground or lawn while being prepared or packed for shipment.

## **Snail control**

General: Military installations and deployments in the Mediterranean region and other high risk areas should establish snail control programs to reduce snail populations on the installations, to control the snails in the vicinity of transportation terminals and to eliminate snails from storage areas. The control of land snails can be accomplished prior to infestation of materials by establishing sound and aggressive physical and chemical control programs. In most instances, both programs should be utilized when practical.

- Physical control: Physical control measures are of definite value in reducing snail populations where chemical control is too hazardous or expensive. During the summer months when the Mediterranean snails are aestivating, their metabolism is greatly reduced, therefore, chemical control is not effective, and physical control is the only method that can be satisfactorily used. Physical control has been found to be of value in reducing populations of *Theba pisana* in open fields bordering open storage areas in North Africa. Specific physical control measures which would routinely apply as preventive measures in countries with highly endemic snail populations are described as follows:
  - Burning-over - Burning vegetation on which aestivating snails attach will reduce snail populations. Burning is most effective during the dry season when the vegetation is dry and the majority of snails are aestivating on the vegetation above ground. The systematic use of flame throwers or commercial weed-burners is effective in reducing snail populations along fence rows, and in areas where other measures may not be practical.
  - Plowing - In open fields, adjacent to outside storage and on-base housing areas, plowing the soil twice a year has been found to reduce both *Theba* and *Cochicella* populations. Cultivating the soil in late autumn destroys many of the immature and adult snails, as well as the eggs that have been deposited in the soil.
  - Disking and culti-packing - This is helpful in reducing land snail populations in areas where plowing may not be practical because of thin top soil or where erosion may be a serious problem. The mechanical action of the disc and culti-packer will eliminate many adult snails, while stirring the soil will destroy many eggs.

- Equipment utilized in grounds maintenance work should not be parked, stored, or allowed to remain in snail-infested areas. This equipment should be cleaned and returned to the equipment storage area at the end of each work day. The care of equipment prevents infestation and spread into storage areas.
- Chemical control: Chemical control of exotic snails typically employs metaldehyde, methiocarb (Mesurol), salt, or combinations of these chemicals with other molluscicides in a myriad of bait formulations or foliar sprays.
  - Metaldehyde treatments applied during dry climatic conditions are usually more successful than the degree of control achieved during damp, high humidity conditions at which time snails are likely to be more active. The principal toxic effect of metaldehyde is through stimulation of the mucous glands which cause excessive sliming, leading to death by dehydration. Metaldehyde is toxic to slugs and snails both by ingestion and absorption by the "foot" of the mollusc.
  - The pesticidal properties of methiocarb are similar to the toxic action of other carbamates which prevent effective nerve transmission by inhibiting the enzyme acetylcholinesterase.
  - In addition to these molluscicides, sodium chloride, common table salt, is an effective dehydrating agent. It may be applied as a 12-inch barrier application on the perimeter of known/suspected snail-infested areas. During periods of rain or high relative humidity, salt barriers should be renewed frequently. Molluscicides are ineffective during periods when snails are aestivating.

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## **TAXONOMY BIOLOGY AND ECOLOGY OF TERRESTRIAL SNAILS**

Members of the class Gastropoda, the largest and most varied group of the phylum Mollusca, includes snails, slugs, and limpets. They are found in marine, fresh-water, and terrestrial habitats. Gastropods have retained the primitive, flat, ventral foot for crawling, but in many other ways have evolved significantly from the ancestral stock. They have all undergone torsion in the general body plan so that the digestive tract is no longer a straight tube, but the anus has coiled to lie on the side and usually near the head. Most gastropods have a coiled shell which corresponds to the coiled visceral mass.

The terrestrial, pulmonate snail *Helix pomatia* Linne typifies the biology and habits of this group. The pulmonate snail is hermaphroditic, and each gravid snail deposits batches of gelatinous-covered eggs in damp places or shallow burrows. Development is direct,

the young emerging as minute snails. Movement is by waves of muscular action on the ventral side of the "foot" over a slime trail of mucus secreted by a gland below the mouth. The type of food varies, but snails prefer tender, young green plants. Food is held in the "law" and rasped off in small bits by the feeding apparatus or radula. Snails tend to hide during the day, though they often feed on cloudy days. Terrestrial snails are mainly nocturnal, but following a rain may come out of hiding during the day. Temperature and moisture, rather than light, are the main factors to account for their nocturnal habits. Native snails may be found everywhere but prefer habitats offering shelter, adequate moisture, an abundant food supply and an available source of lime. Forested river valleys generally provide such habitats, and those with outcrops of limestone usually show the most abundant and varied mollusk faunas. Snails are very adaptable to times of drought and adverse climatic conditions. During these periods, the snail closes the shell aperture with a mucus flap (epiphragm) which hardens and prevents desiccation. Snails can remain in this dormant state (aestivation) for years, breaking dormancy when climatic conditions are favorable again.

### **Families of terrestrial snails of agriculture and quarantine significance intercepted in military cargo**

#### Family Achatinidae

The giant African snail, *Achatina fulica*, Bowdich is the largest (shell length 125 mm or more), most voracious and reproductively prolific snail to have been introduced into this country. Its origin is south of the Sahara in East Africa and is established in Asia and the Indo-Pacific Islands, including Hawaii. The giant African snail was inadvertently released in California after World War II and in North Miami in the 1970s. In each instance, eradication efforts were successful, but very expensive.



#### Family Bradybaenidae

The most well-known member of this family, *Bradybaena similaris*, is a snail of medium size (approximately 12-16 mm in diameter). The shell is wider than high, thin, narrow

with a rather depressed spire. The shell is white to greenish yellow, often with a single, spiral, chestnut band.

It probably originated somewhere in China but is now widely distributed over the world. *B. similaris* is a severe pest of coffee trees and is found wherever this crop is grown.



Family Helicidae

This family is the most prevalent and contains the largest European snails, including *Theba pisana* (White garden snail). Distribution of this group is from the countries bordering the Mediterranean Sea.

The shells of the Helicidae are usually medium to very large in size, thick, and often brightly colored, but there is an immense range of size, shape and coloring between and sometimes within species. Members of the family are found in a very wide range of habitats, but there are, within the family, groups of species which share similar features of habitat, size, and way of life. Recently, the white garden snail, *T. pisana*, has become established in San Diego County, California.



Family Succinidae

*Succinea horticola* Reinhart is the most important species of this family and is found mainly in the Orient, i.e., China, Japan and Okinawa. *S. horticola* is also found in Greece and Italy. This snail is a very severe pest of greenhouse plants and grasses.



Table 1. Twenty snails most commonly intercepted on retrograde military cargo or household effects and countries of origin

Scientific Name	Number of Interceptions	Countries of Origin
<i>Theba pisana</i>	376	Spain-Israel-Portugal
<i>Helicella spp</i>	307	Italy-Israel-Greece
<i>Helix aspera</i>	192	Italy-Mexico-Spain
<i>Succinea horticola</i>	146	Italy-Japan-Greece
<i>Helicella conspurcata</i>	119	Italy-Spain-Greece
<i>Cochlicella barbara</i>	109	Italy-Spain-Greece
<i>Cochlicella spp</i>	108	Israel-Portugal-Italy
<i>Monacha spp</i>	54	Israel-Italy-Greece
<i>Helicella maritima</i>	53	Italy-Spain-France
<i>Monacha syrlaca</i>	48	Greece-Italy-Turkey
<i>Helicella cretica</i>	48	Greece-Italy-Turkey
<i>Helicella virgata</i>	47	Italy-Spain-France
<i>Monacha carthusiana</i>	47	Italy-France-Israel
<i>Helicella gigaxii</i>	46	Italy-Spain-Greece
<i>Otala spp</i>	45	Italy-Greece-Spain
<i>Cepaea spp.</i>	42	Hawaii-Brazil-France
<i>Cochlicella conoidea</i>	35	Italy-Germany
<i>Helicella protea</i>	31	Turkey-Italy-Israel
<i>Achatina fulica</i>	31	Hawaii-Taiwan-Hong Kong
<i>Helicella derbentina</i>	28	Turkey-Italy-Greece

Source: Interception Records (1974-1987) USDA-APHIS



# POST-EXPOSURE PROCEDURES FOR RETROGRADE MILITARY EQUIPMENT

Notification of Infestation - The nearest representative of APHIS should be notified of a known or suspected snail infestation on any vehicles, weapons, or any other type of military equipment which is being returned to CONUS from a foreign country in which snails declared to be under quarantine by APHIS exist. A list of APHIS inspectors, location of work sites and their telephone numbers should be maintained at every port-of-entry where military equipment would be received. This list should be reviewed and updated at least annually. Contaminated military cargo, equipment, and/or household effects under USDA quarantine should never be moved any further from the point of disembarkation than is essential to affect the necessary decontamination procedures.

## **Decontamination Procedures of Snail-Infested Cargo**

Freshwater wash down (high pressure) is the most accepted, effective and inexpensive method if infestation is obvious and snails are superficially attached. Prior to high pressure wash down, all soil plant material and any other debris should be removed by scraping, brushing or any suitable and appropriate method that will remove gross contamination prior to the actual wash down. The military inspector, after contacting APHIS should be aware of the ultimate disposition of all live and dead snails and any plant material/soil which has been removed during the wash down procedures. If this material does not enter a sanitary sewer system where chemical treatment would be routine, other steps should be taken. A suitable option would be to conduct the cleaning procedure(s) on a concrete or asphalt hardstand which would permit collection and proper disposal of material removed during wash down.

Live steam wash down is an effective method, providing equipment and facilities are available. Live steam is highly lethal to molluscs, but extreme safety precautions must be followed both for the safety of the operator and the vehicles or equipment to be cleaned. These would include the use of protective rubberized outer clothing, rubber boots, rubber gloves and protective face and head gear. The peripheral area of the live steam decontamination area should be well marked, and protective barriers should be in place before beginning the cleaning procedures. Extreme care should be exercised when steam is used-to clean metal surfaces because of the burn hazard of the heated metal.

## Chemical Methods:

With the development of suitable devices for measuring gas concentrations, fumigation under temporary enclosures has become generally accepted as a reliable method of snail eradication. Its adaptability for use under a variety of circumstances makes it an irreplaceable method in many instances. The use of a temporary enclosure for the fumigation of snail-infested cargo certainly contains elements of risk beyond those of an approved fumigation chamber. However, it can be used effectively against many plant pests and when properly managed should not present any serious safety hazard.

Fumigation must be performed only by properly trained and certified applicators. APHIS is certified to oversee fumigations.

### Fumigation Procedures

Methyl bromide (MB) is one of the principal fumigants used under tarpaulins for shipboard, and/or warehouse fumigations. It is a colorless gas, and usually supplied as a heavy, volatile liquid under pressure. The gas volatilizes when released from containers at ambient temperatures of 400 F(4.4 Co) or above. In the actual fumigation procedure, vaporizers and circulatory fans are used to increase diffusion and penetration of this fumigant.

Like all effective fumigants, MB is very dangerous to humans and when improperly handled may produce serious consequences. Fumigations should always be under the supervision of a responsible person who is properly certified and thoroughly familiar with the fumigant and the hazards that may prevail. Exposure of personnel to all concentrations is to be avoided. The threshold limit value has been established at 5 ppm in air for repeated exposures, 8 hr per day, 5 days per week. A concentration of 2,000 ppm is considered to be immediately dangerous to life and health. There is also a chronic toxicity hazard from continuous exposures to low concentrations in air. However, MB poisoning, both acute and chronic, can be avoided with appropriate training. Reasonable care good Judgment, and proper safety equipment.

Although the commercial fumigator is responsible for producing the desired results, the military entomologist/inspector must assume a functional role during the operation. He must confer with the fumigator and decide upon the best possible method to follow. Only thorough familiarity with the materials and procedures involved can this be best accomplished.

Before any large fumigations are started, the commercial fumigator should make sure that local ordinances are understood and followed. Police and fire departments should be notified~ if required by law. Public safety must be the utmost consideration; and although the military inspector cannot assume the responsibility of providing complete protection, he should be able to recognize unsafe procedures and offer advice concerning dangerous situations which may arise.

### Treatment Schedules for Snails

[http://www.aphis.usda.gov/ppq/manuals/pdf\\_files/Treatment\\_Chapters.htm](http://www.aphis.usda.gov/ppq/manuals/pdf_files/Treatment_Chapters.htm)

## **APPENDIX J: USDA APHIS History of Interceptions**

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<b>U.S. MILITARY PRECLEARANCE PROGRAM</b>	
The U.S. Government property to which this label has been affixed meets the entry Requirements of the U.S. Department of Agriculture	
Unit of Origin	U.S. Port of Entry
Inspector's rank and name ( <i>Last, First M.I.</i> )	Date
Remarks	U.S. Department of Agriculture

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