



**US Army Corps
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Waterways Experiment
Station

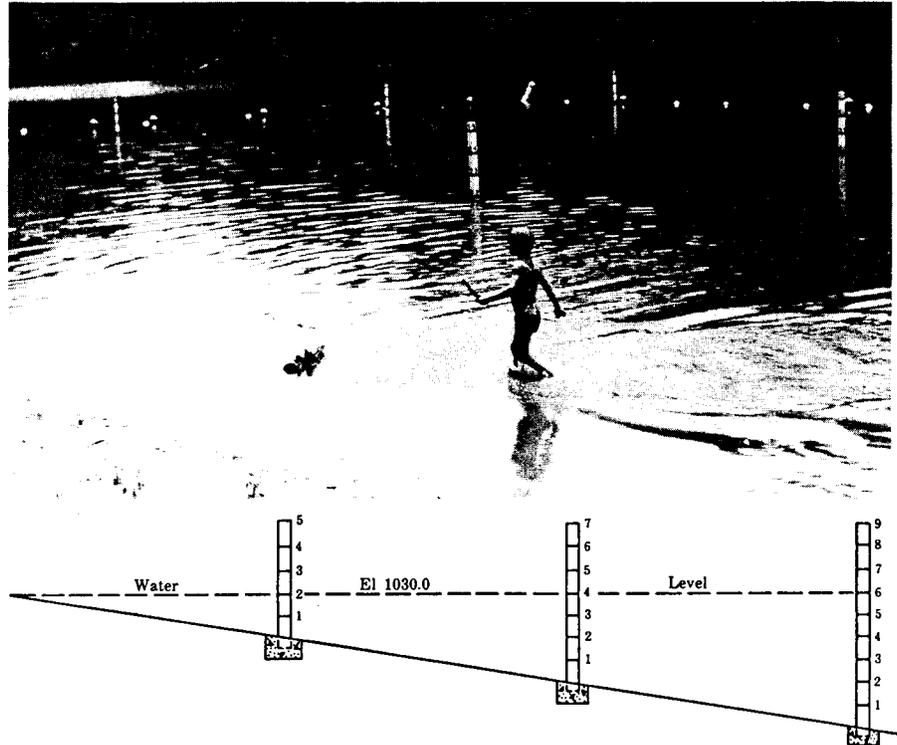
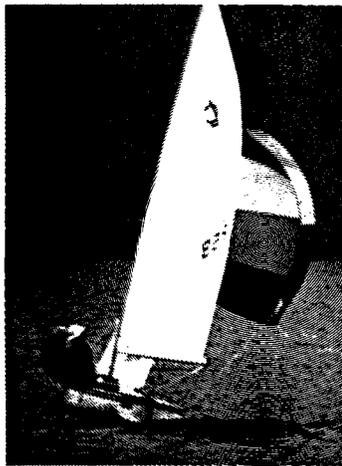
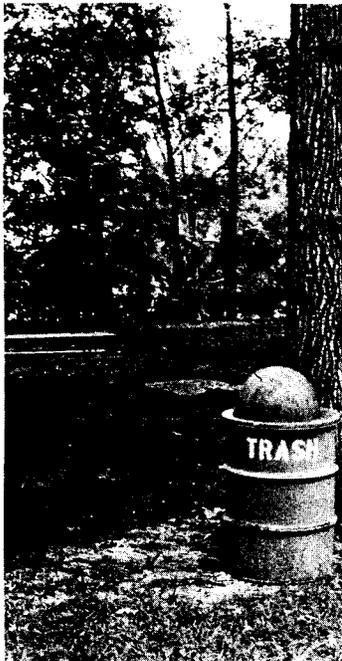
RECNOTES

RECREATION
RESEARCH
PROGRAM

VOL R-83-2

INFORMATION EXCHANGE BULLETIN

AUG 1983



HELPFUL HINTS — Many problems solved by Resource Managers are not unique to a specific project. The same is true of development of some management and operational techniques. Handouts with descriptions of such solutions and techniques were a feature of the SAD Resource Managers Workshop held in January 1983 in Palatka, Florida. This RECNOTES issue is devoted to some of these Resource Management practices.

IMPROVING SAFETY IN SWIMMING AREAS

*Submitted by: Andrew Duncan, Resource Manager,
W. Kerr Scott Lake, Wilmington District*

The area inundated by the W. Kerr Scott reservoir had a steep topography. After the reservoir was filled, the high relief caused bottoms with deep drop-offs underwater. Even though waters off gently sloping shores were designated for swimming, two major swimming areas included some of the drop-offs.

Drought in 1981 lowered the pool elevation to 10 ft below normal, which

provided the opportunity to remedy the potentially hazardous conditions. Heavy equipment was used to grade the beach and swimming areas to create a uniformly gentle slope, and then sand was deposited over the entire area. Sandbags were placed around the perimeter to keep the sand from washing away.

The most important improvement was installation of water-depth

indicators so that swimmers could avoid deep waters or sudden drop-offs. Treated 4- by 4-in. posts were painted white, and black numerals were lettered on each side at 1-ft intervals. Three lines of three posts each were installed at each swimming area. A surveying level was used to get correct elevation and alinement when the posts were set in concrete. The cover figure shows the swimming area water-depth indicators.

Public comments on the improvements and the depth indicators have been favorable, and the observed use by parents and their small children has increased dramatically. These actions have contributed to the commitment to provide the visiting public with the highest quality recreation experience and the safest facilities possible within budget constraints.

INDIVIDUAL TRASH CANS VS GREEN BOXES FOR TRASH COLLECTION

*Submitted by: Maurice Ruddle, Resource Manager,
Philpott Lake, Wilmington District*

The Resource Manager at Philpott Lake reports that a service contract has been used successfully for garbage collection from dumpsters ("green boxes"). The system is reinforced by good education and public relations programs.

Philpott Lake has four fee camping areas that include 204 individual campsites. Three of the four areas have one 6-cu-yd green box (see photo right) and one area has two 6-cu-yd green boxes. Each campsite has a 32-gallon trash can (top photo at left of cover), and a plastic garbage bag is issued for each campsite each day. When campers register, they are told of their responsibility for depositing bagged garbage.

Cost comparisons were made for the recreation season from 15 May to 15 September 1982. Collection from individual trash cans is hypothetical since the dumpsters were in use, but the costs are real based on charges for the service to residents in the same general area.

In the four camp areas, there would be 204 32-gallon cans to service. The present contractor would charge \$1/service/trash can. To ensure proper service during the recreation season (15 May to 15 September 1982), a service schedule of Monday-Wednesday-Friday collections would have been used. Each of the 204 cans would have been serviced 53 times for a total cost of \$10,812 for the season.

The five green boxes were serviced by the contractor at a rate of \$25 per trip for the three single-box areas and \$40 per trip for the double-box area. During the 1982 recreation season, 65 trips were required for the single-box areas at a cost of \$1,625; 31 trips were made to the double-box area at a cost of \$1,240. The total contract cost was \$2,865. The plastic garbage bags issued to the campers cost \$261, and the indirect costs of handling the bags, informing the public, and following up on violations



Dumpster (6-cu-yd green box)

were estimated to be \$1,000. The total cost of the dumpster method was \$4,126 (\$2,865 + \$261 + \$1,000), which is \$6,686 (62 percent) less than the estimated cost of collection from individual trash cans. There would be some additional savings because trash-can replacement costs would be less, but those costs could not be quantified.

The effectiveness of the education/information program is indicated by the low number of violations: eight warning citations were issued with letters to campers who left their campsites without depositing trash bags in the green boxes.

CONTRACTING MAINTENANCE ACTIVITIES

*Submitted by: Ed Smith, Resource Manager,
Hartwell Lake, Savannah District*

The Resource Manager of Hartwell Lake uses contract labor and equipment for almost 80 percent of all project maintenance and site-improvement activities. The work is covered by two *fixed-price* service contracts: a Minor Maintenance Contract and a Major Maintenance Contract.

Under the Minor Maintenance Contract, the contractor's responsibilities include cleanup, grass cutting, minor repairs not requiring skilled labor, touch-up painting, and boundary-line maintenance. The government supplies materials for the minor repairs and painting; and, in addition to all the labor, the contractor furnishes all equipment, supplies, and material for cleanup and grass cutting.

The Major Maintenance Contract provides on-call skilled labor and heavy equipment capabilities for both routine and intensive maintenance activities. Table 1 shows some of the equipment/operator and skilled services covered by the contract.

During the 6-month recreation season, the Minor Maintenance Contract specifies complete cleanup of 62 recreation areas 5 days a week; minor repairs as needed; grass cutting every week at the Resource Manager's office, the powerhouse, and the dam and cutting every third week in other areas. During the other 6 months, the contract requires a complete weekly cleanup of the 62 recreation areas, minor repairs when necessary, painting 15 sanitary facil-

Table 1 - Equipment and Services Covered Under Major Maintenance Contract

<i>Equipment/Operator</i>	<i>Skilled Services</i>
Backhoe	Welding
Bulldozer	Landscaping
Tractor (large) and bush-hog	Painting
Skid tractor	Carpentry
Crawler/loader	Masonry
Trencher	Plumbing
Flatbed dump trucks	Road repair
Tandem dump trucks	Electrical work
Dragline	Crosstie installation
Tractor (small) with assorted attachments	Retaining wall installation
Wood chopper	Tree and limb cutting
	Associated unskilled services

ities, and clearing and marking 200 miles of project boundary lines.

The fixed-price concept of contracting attracted more competition from small local contractors than would have responded to a more complex cost-plus-fixed-fee advertisement. Both contracts were awarded for very reasonable up-front costs to local contractors, who would do good work because they desire to maintain their reputations for excellence in the community.

INSPECTIONS CHECKLIST FOR ROUTINE VEHICLE MAINTENANCE

*Submitted by: John Leroy, Resource Manager,
R. B. Russell Lake, Savannah District*

At Richard B. Russell Lake, personnel-space limitations have forced the operation and maintenance program to use commercial repair facilities for routine vehicle maintenance. While there are many Corps publications that give detailed procedures for the items of work required for performing routine checks and repair of vehicle deficiencies, there does not seem to be a consolidated inspections checklist to be kept by the vehicle's operator with entries by the mechanic who performs an inspection and necessary repairs.

A checklist (insert) was developed to be initiated by the regular or usual operator of a vehicle before a 6,000-miles/6-months or 12,000-miles/12-months inspection. In the first part of the form, the driver is given a list to use in inspecting the vehicle and indicating safe operation or explaining an item's unsafe condition. The list is used to identify required repair.

The second part of the checklist gives the mechanic a list of routine maintenance items to be performed

and items to be checked for safe operation at both 6,000 and 12,000 miles. Part III is for the mechanic to use for 12,000-miles/12-months service. Part IV is used for additional entries or instructions by the vehicle operator and the mechanic.

Instituting the checklist system has resulted in cost and time savings and has had several other benefits:

- Identifies the employee responsible for the maintenance and safety checks.
- Provides a convenient service record for each vehicle.
- Gives mechanic specific instructions for items of work to be performed.
- Avoids inflated or incorrect bills by requiring the mechanic to checkmark items of work performed and to sign the form.

HELP WANTED!

This RECNOTES issue contains some South Atlantic Division resource management practices that could be useful to other projects. Obviously, this is just the tip of the iceberg. . . there are many other resource management practices used at specific projects that could be shared. RECNOTES avidly solicits similar articles to publish. Furthermore, you are welcome to submit articles that define any resource management problems to seek help from other Corps elements. Feel free to submit articles of any length. Give us a call if you are unsure of how to write your article or if you just want to discuss your problem or the article (telephone 601-634-3920). RECNOTES is *your* information exchange bulletin.

RESTRICTING BOAT-LAUNCHING AREAS RESTRICTS PARTIES

*Submitted by: David Grabensteder, Resource Manager,
Allatoona Lake, Mobile District*

Because Allatoona Lake is accessible to the urban residents of the Atlanta Metropolitan Area, it has been the scene of an excessive number of all-night parties. Young people like to drive out to the lake in the late afternoon, gather in large groups near the water, and carouse until the early morning hours. Some engage in boisterous and obscene behavior, commit acts of vandalism or theft of both private and government property, and cause distress to the campers in the area. When the party breaks up, they rush away and leave behind a terrible mess.

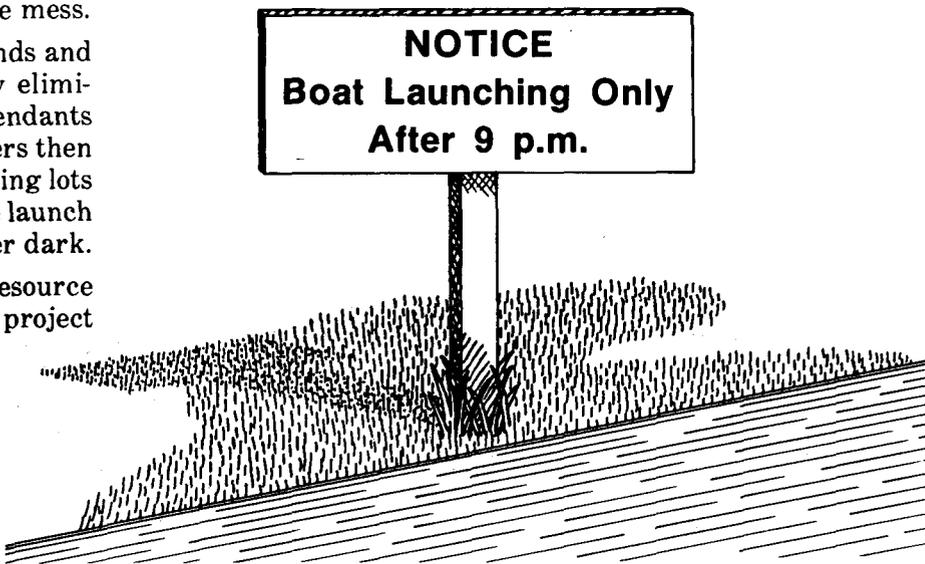
At first the groups met in the campgrounds and picnic areas. The problems were virtually eliminated in these locations by using gate attendants and closing the gates at 10 p.m. The revellers then moved the gatherings to the boatramp parking lots and continued their offensive activities. The launch areas became unsafe for boaters to use after dark.

Under Paragraph 327.12a of Title 36, a Resource Manager is allowed to close a portion of a project when necessary for reasons of public interest: health, safety, or maintenance. Closing the launching areas was justified for all of these reasons.

Signs were erected at the entrance of each launching area restricting the use of the area after 9 p.m. to boat launching. Posting

these notices gave the rangers authority to move visitors from the areas if they engaged in unauthorized activities and also to cite the visitors if necessary. Sheriff's patrols could disperse groups when the rangers were not on duty.

This simple management tool has effectively halted nighttime parties in the boat-launching areas.



NOTICE
Boat Launching Only
After 9 p.m.

AERIAL OBSERVATION OF PROJECTS

*Submitted by: Tony Tumbun, Resource Manager,
Tenn-Tom Lakes, Mobile District*

The management of any large river system or lake project presents a special problem in providing adequate surveillance of facilities (see photo below). In these days of reduced staffing, the problem can become critical. The Resource Manager of the Tenn-Tom Lakes uses contract air service to patrol portions of the project at least quarterly. A local flying agency provides an airplane and a pilot for the periodic aerial observations.

In the overflights, specific problems such as encroachments in remote areas and shoaling on a river can be easily identified and noted for ground-

level reconnaissance if needed. Without aerial observation, such problems might go unnoticed for some time. Aerial observation also enables the manager to view portions of the project in relation to nearby acreage to detect duplication of services, conflict of area purposes, and other similar problems.

The cost of aerial service by contract is a relatively inexpensive means for a manager to view his project in a matter of hours as opposed to days of land travel. In addition to cost effectiveness, aerial observation has the dividend of giving a manager a broad perspective of the project that is his responsibility.



Aerial view of lake-front recreation area and adjacent land

MOSQUITO CONTROL CONCEPTS

*Submitted by Joe Tanner, Resource Manager,
Falls Lake, Wilmington District*

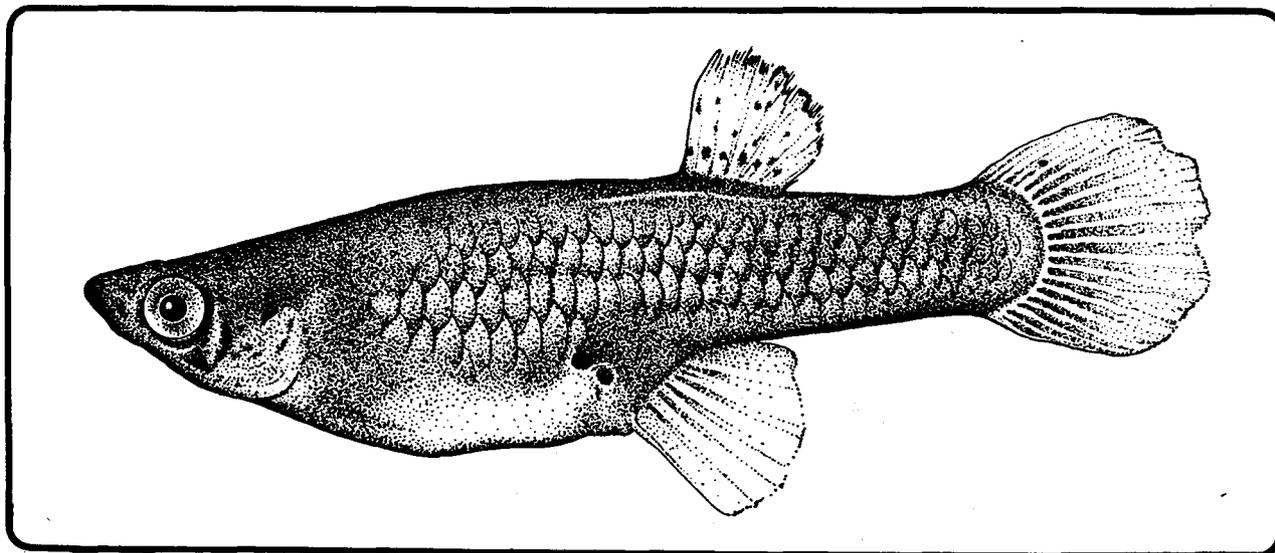
Biological control is now possible for some of the conditions that can produce large quantities of mosquitoes. These biological controls are both effective and nontoxic.

Areas of standing water that breed mosquitoes are easily treated with mosquito fish, *Gambusia affinis*. These small top minnows are readily available in creeks, ponds, and lakes. They can easily be captured by minnow nets or traps and transported to small areas of standing water known to produce mosquitoes. These fish can breathe air and can survive varying water conditions; e.g., temperature, salinity, or dissolved oxygen changes. They are prolific breeders and can be raised in the mosquito habitat or in small ponds for future use. Their major diet is mosquito larvae and aquatic insects. They are live bearers and spawn every month during the summer.

The easily adaptable mosquito fish can tolerate brackish as well as fresh water and water temperatures that range from 40 to 100° F. Although the fish has a life span of only 15 months, field experiments in Michigan have indicated that mosquito fish were effective in reducing mosquito populations in experimental ponds by 80 to 95 percent.—Editor's note.

If a mosquito-producing area is intermittently flooded, a bacteria, *Bacillus thuringiensis israelensis* (*Bti*), can be used. This bacteria is also used to fight various caterpillars in vegetable and tobacco patches. The bacteria is nontoxic to most animals. It attacks mosquito larvae readily and reproduces in the mosquito larvae, thus, multiplying at the same time it kills the larvae.

The Environmental Protection Agency has recently registered *Bti* bacteria under *Bactimos* label with Summit Chemicals, Baltimore, Md. The bacteria can be obtained in wettable powder, flowable concentrate, or briquet formations. The Wilmington District used the wettable powder on a dredged material island (Eagle Island) during the 1981 mosquito season with excellent results. It was bound to sand and applied by fixed wing aircraft. The flowable concentrate can be used in a hand sprayer. The most beneficial form, however, is the briquet. It can be placed in mud holes or drainage ditches. The briquet dissolves over a 30-day period, steadily releasing *Bti* bacteria. If the water dries up, the briquet will remain effective until the next flow of water. The briquets are safe to store without the precautions that are necessary with pesticide chemicals. They can be applied at the time of sampling by any trained personnel. The briquets cost more than the mosquito fish (43¢ vs. free) but are as effective and will give control in intermittently dry areas.



Mosquito fish, *Gambusia affinis* (female, 1.5 inch)

CONSERVATION COMMUNICATION SCHOLARSHIP ESTABLISHED

A scholarship to help bridge the gap between natural resource management and the need for communication skills has been established at the University of Idaho, beginning with the 1983-84 academic year. Dr. James R. Fazio, professor at the Department of Wildland Recreation Management, has donated royalties from his recently published book to endow a fund to provide one or more \$500 scholarships each year to UI students enrolled in the College of Forestry, Wildlife and Range Sciences, who have demonstrated an interest in public information and education and are willing to

take coursework in communications before they graduate. Dr. Fazio and Dr. Douglas L. Gilbert were co-authors of the book, "Public Relations and Communications for Natural Resource Managers."

The endowment was established for two purposes: to encourage students who are aware of the importance of being good communicators as well as good managers and to honor the memory of Dr. Gilbert, an early proponent of resource communication. The scholarship has been named The Douglas L. Gilbert Scholarship for Conservation Communication.

MAGNETIC-LOOP TRAFFIC COUNTERS

All pneumatic-tube traffic counters in the Jacksonville District's Natural Resource Management Program have been replaced with magnetic-loop battery-powered counters. The change in type of counter has increased counting accuracy by 25 percent because of

- Less down time due to fewer malfunctions.
- Less vandalism than was experienced by the more conspicuous pneumatic tube/counter box systems.
- Greater counting efficiency.

For more information concerning magnetic-loop counters contact: Joe Joyce, SAJCO-OR, 904-791-2251 (FTS 946-2251).

RECENT PUBLICATIONS

Gilbert, Douglas L., and Fazio, James R., 1982. *Public Relations and Communications for Natural Resource Managers*, Kendall/Hunt Publishing Company, 2460 Kerper Blvd., Dubuque, IA (price \$19.95/375 pages).

Echelberger, H. E., Gilroy, D., and Moeller, G., 1983. *1961-1982 Recreation Research Publications*, Forest Service, U. S. Department of Agriculture, Washington, D.C. (limited copies available upon request to Skip Echelberger, Northeastern Forest Experiment Station, P.O. Box 968, Burlington, VT 05401/94 pages).



RECREATION RESEARCH PROGRAM

This bulletin is published in accordance with AR 310-2. It has been prepared and distributed as one of the information dissemination functions of the Environmental Laboratory of the Waterways Experiment Station. It is primarily intended to be a forum whereby information pertaining to and resulting from the Corps of Engineers' nationwide Recreation Research Program can be rapidly and widely disseminated to OCE and Division, District, and project offices as well as to other Federal agencies concerned with outdoor recreation. Local reproduction is authorized to satisfy additional requirements. Contributions of notes, news, reviews, or any other types of information are solicited from all sources and will be considered for publication as long as they are relevant to the theme of the Recreation Research Program, i. e., to improve the effectiveness and efficiency of the Corps in providing recreation opportunity at its water resource development projects. This bulletin will be issued on an irregular basis as dictated by the quantity and importance of information to be disseminated. Communications are welcomed and should be addressed to the Environmental Laboratory, ATTN: A. J. Anderson, U.S. Army Engineer Waterways Experiment Station, P.O. Box 631, Vicksburg, Mississippi 39180, or call AC 601, 634-3657 (FTS 542-3657).

TILFORD C. CREEL
Colonel, Corps of Engineers
Commander and Director

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INSPECTIONS CHECKLIST FOR ROUTINE VEHICLE MAINTENANCE

**6,000 miles/6 months
and
12,000 miles/12 months
(Circle inspection required)**

Make of Vehicle _____ Vehicle Tag No. _____
 Present Mileage _____ Mileage at Last Inspection _____
 Vehicle Operator _____ Date of Last Inspection _____

I. OPERATOR

For both 6,000 miles/6 months and 12,000 miles/12 months inspections.

Items to be checked by VEHICLE OPERATOR for safe operation. Should be performed by regular or usual operator.

Item	Operates Safely		* Explain Unsafe Condition
	Yes	No	
A. Brake Action			
B. Clutch Action			
C. Instrument Panel			
D. Window Controls			
E. Door Controls			
F. Seat Belts			
G. Horn			
H. Lights			
I. Heater/Defroster			
J. Air Conditioner			
K. Windshield Wiper			
L. Mirrors			
M. Glass			
N. Other			

*Required work should be outlined in Part IV A for mechanic to repair.

Vehicle Operator's Signature

Date

II. MECHANIC

During both 6,000 miles/6 months and 12,000 miles/12 months inspection.

A. Routine maintenance to be performed by MECHANIC.

(Mechanic, check (✓) as performed.)

- ___ 1. Change oil and oil filter.
*Specified oil brand _____ and weight _____
- ___ 2. Check all drive belts and hoses for leaks, cracks, deterioration. Tighten or replace, if necessary.
- ___ 3. Check battery water and test cells. Clean terminals and battery holder. Battery is ___ good ___ needs replacing.
- ___ 4. Top up fluid levels of brake master cylinder, automatic transmissions and power steering when applicable. Inspect for leaks and report if present.
- ___ 5. Remove carburetor filter(s) and air blow clean. Replace only if necessary.
- ___ 6. Check winter/summer coolant for optimum engine performance. Top up if necessary.
- ___ 7. Grease all fitted joints.
- ___ 8. Rotate tires, if applicable; i.e. some vehicles have different types of treads on front and rear.

*Usually specified by government employee to conform with that used at duty station and/or required by vehicle.

B. Checks to be performed by MECHANIC for safe operation.

	Operates Safely		Explain Repairs Required*
	Yes	No	
1. Steering rods & ends			
2. Propeller shafts and universal joints			
3. Shock absorbers or struts			
4. Wheel bearings			
5. Hydraulic brake hoses			
6. Parking brakes			

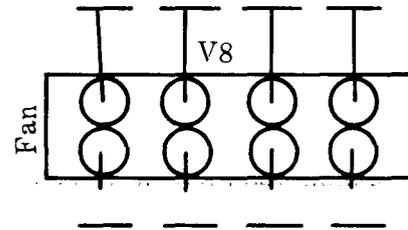
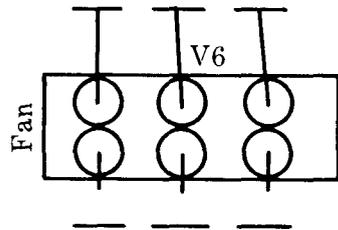
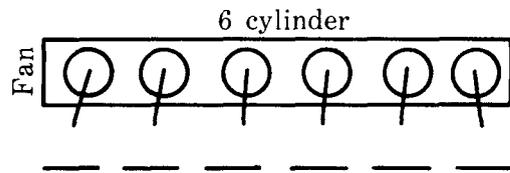
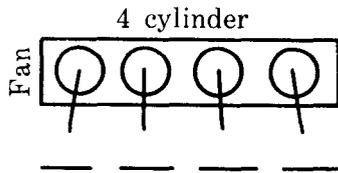
*Report to vehicle operator before repairing.

III. MECHANIC

12,000 miles/12 months Service (sooner when necessary and approved).

A. Routine maintenance to be performed by MECHANIC in addition to II, as outlined previously. (Mechanic, check (✓) as performed.)

- ___ 1. Remove spark plugs, clean, inspect, and adjust. Replace if necessary.
- ___ 2. a. Make cylindrical compression test and complete applicable diagram with actual meter readings:



- b. Do results of compression test indicate engine is within normal range of operation?
_____ yes _____ no
- ___ 3. Check distributor. Inspect points (where applicable) and replace, if necessary.
- ___ 4. On vehicles with DC generators, inspect brushes and armature. Replace if necessary. Check generator pulley.
- ___ 5. Check exhaust system for leaks and report to operator.
- ___ 6. Remove all wheels. Inspect shoes and drums, disc pads, and rotors. Check wheel cylinders/pistons.
- ___ 7. Repack front wheel bearings. Inspect for wear.
- ___ 8. Check and adjust toe-in and front end alignment if need is indicated by tread wear.
- ___ 9. Rotate tires if applicable; i.e. some vehicles have different types of treads on front and rear.

IV. OPERATOR AND MECHANIC

Either 6,000 miles/6 months or 12,000 miles/12 months.

A. Additional inspections, checks, and/or repairs not outlined previously but requested by VEHICLE OPERATOR or mechanic:

B. *Additional inspections, checks, and/or repairs not outlined previously but suggested and performed by MECHANIC for safe operation:

*All additional work must be approved by government employee prior to being done.

Mechanic's Signature

Date