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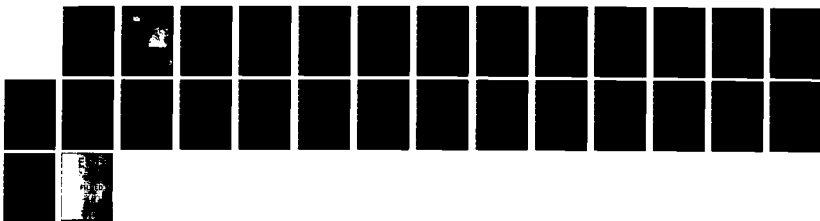
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AND 47275(U) AIR FORCE OCCUPATIONAL MEASUREMENT CENTER  
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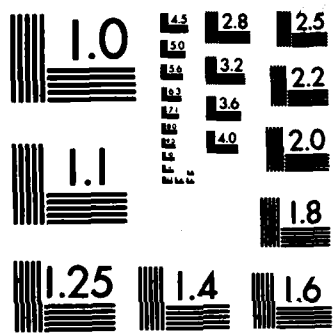
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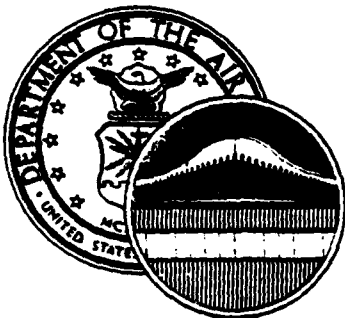
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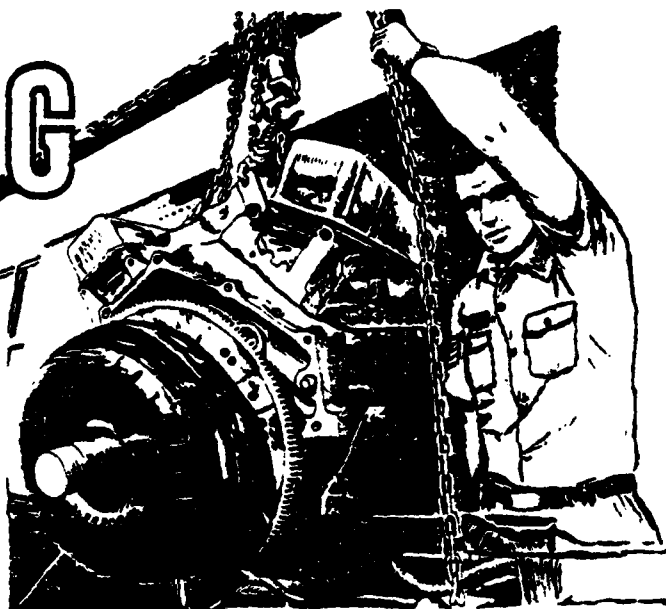
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UNITED STATES AIR FORCE

# TRAINING REPORT



VEHICLE BODY MECHANIC  
CAREER LADDER

AFSCs 47233, 47253, AND 47275

AFPT 90-472-442

MARCH 1983

DTIC  
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MAY 17 1983

OCCUPATIONAL ANALYSIS PROGRAM  
USAF OCCUPATIONAL MEASUREMENT CENTER  
AIR TRAINING COMMAND  
RANDOLPH AFB, TEXAS 78150

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TABLE OF CONTENTS

	<u>PAGE NUMBER</u>
PREFACE -----	iii
SUMMARY OF RESULTS -----	iv
INTRODUCTION -----	1
SURVEY METHODOLOGY -----	3
Inventory Development -----	3
Job Inventory Administration -----	3
Task Factor Administration -----	4
Survey Sample -----	5
ANALYSIS OF FIRST-ENLISTMENT PERSONNEL -----	7
AFS 472X3 First-Enlistment Personnel -----	7
Analysis of First-Enlistment MAJCOM Differences -----	10
TRAINING ANALYSIS -----	11
3- and 5-Skill Level Specialty Training Standard -----	11
47275 Specialty Training Standard -----	13
Plan of Instruction -----	17
SUMMARY AND IMPLICATIONS -----	22



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## PREFACE

This report presents the results of a detailed Air Force Occupational Survey involving the training requirements for first-enlistment personnel in the Vehicle Body Mechanic (AFS 472X3) specialty. The project was initiated in response to a need for current job information in the career field. Authority for conducting occupational surveys is contained in AFR 35-2. Computer printouts from which this report was produced are available for use by operational and training officials.

Chief Master Sergeant Robert M. Wing, Inventory Development Specialist, developed the survey instrument for this project. Ms Viola L. Allen and Ms Elena J. Weber analyzed the data and wrote the final report. Computer products for this report were generated by Mr Bill Feltner and Ms Olga Velez. This report has been reviewed and approved by Lieutenant Colonel Jimmy L. Mitchell, Chief, Airman Career Ladders Analysis Section, Occupational Analysis Branch, USAF Occupational Measurement Center, Randolph AFB, Texas 78150.

Copies of this report are distributed to the organizations shown on page i. Additional copies may be obtained by contacting the USAF Occupational Measurement Center, attention to the Chief, Occupational Analysis Branch (OMY), Randolph AFB, Texas 78150.

This report has been reviewed and is approved.

PAUL T. RINGENBACH, Colonel, USAF  
Commander  
USAF Occupational Measurement  
Center

WALTER E. DRISKILL, Ph.D.  
Chief, Occupational Analysis Branch  
USAF Occupational Measurement  
Center

## SUMMARY OF RESULTS

1. Survey Objectives: The purpose of this report is to provide occupational survey data to use in assessing current Vehicle Body Mechanic training documents and programs involving first-enlistment 472X3 personnel.
2. Survey Coverage: Training emphasis and task difficulty ratings were collected from senior AFSC 47253 (Vehicle Body Mechanic) personnel and AFSC 47275 (General Purpose Vehicle and Vehicle Body Maintenance Supervisor) members. Unfortunately, the 472X3 training emphasis ratings could not be used due to the lack of acceptable agreement among the raters.
3. Analysis of First-Enlistment Personnel: The 472X3 first-enlistment personnel performed a job distinctly different from other vehicle mechanics. All 472X3 first-term members performed essentially the same basic job involving the repair of vehicle bodies on a wide variety of different vehicles.
4. Training Analysis: Since the training emphasis ratings could not be used, training documents were evaluated using only percent members performing data. Current STSs for 47233/53 and 47275 personnel provide good coverage of most functions performed with some areas in need of review. In terms of the POI, many of the objectives were support by survey data. Some objectives, however, either were not support by survey data, or could not be evaluated due to lack of matching tasks. Subject-matter specialists and training personnel need to review these areas to determine if changes should be made.
5. Summary and Implications: Utilization of 7-skill level personnel is one important area which needs to be addressed. A Utilization and Training workshop on all vehicle maintenance specialties may be necessary to address this issue, other utilization issues within the vehicle maintenance career field, and to assess current and projected training needs and programs.

TRAINING REPORT  
VEHICLE BODY MECHANIC SPECIALTY  
(AFS 472X3)

INTRODUCTION

This is a report of a training analysis of the Vehicle Body Mechanic specialty (AFS 472X3) completed by the Occupational Analysis Branch, USAF Occupational Measurement Center, in January 1983. The survey was initiated to obtain current task and background data for use in the evaluation and management of training programs for this career ladder. Analyses of the job structure, DAFSC groups, AFR 39-1 specialty descriptions, job satisfaction, CONUS and overseas groups, MAJCOM groups, and utilization of Vehicle Maintenance personnel were covered in an Occupational Survey Report (OSR) published in August 1982. Separate training reports on the Base Vehicle Equipment Mechanic (AFS 472X0), Special Vehicle Mechanic (AFS 472X1A/B/C/D), and General Purpose Vehicle Mechanic (AFS 472X2) are also available.

Background

The Vehicle Maintenance career field (excluding AFS 472X4 - Vehicle Maintenance Control and Analysis) currently consists of seven separate AFSS through the 5-skill level. These seven AFSS merge into two AFSS at the 7-skill level (AFSC 47271 - Special Vehicle and Base Vehicle Equipment Supervisor, and AFSC 47275 - General Purpose Vehicle and Body Maintenance Supervisor); additionally, there is a common 47299 (Vehicle Maintenance Superintendent) and CEM Code 47200 (Vehicle Maintenance Manager). As described in AFR 39-1, AFS 472X3 (Vehicle Body Mechanic) personnel work on all types of vehicles and are responsible for repairing and replacing body panels, fenders, and radiators; straightening vehicle frames; refinishing vehicle bodies; welding metals; and cutting and fitting vehicle glass. AFS 472X3, along with General Purpose Vehicle Mechanics (AFS 472X2), are supervised by AFS 47275 personnel.

Members of the 472X3 specialty receive their 3-skill level upon completion of requirements for Interservice Course 704-47233, Vehicle Body Mechanic. Personnel attend 10 weeks of training at the US Army Ordnance Center and School, Aberdeen Proving Grounds, Maryland. Training includes oxyacetylene, metal arc, and gas shielded welding; body and fender tools and equipment repair; repainting and installing metal body components; repairing radiators and fuel tanks; glassworking; and common maintenance subjects.

Objectives

This training report provides task data training managers can use in conjunction with career ladder documents to assess the effectiveness of Vehicle Body Mechanic (AFS 472X3) training. Topics discussed in this report

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include: (1) survey methodology; (2) tasks performed, vehicles maintained, and tools and equipment used by first-enlistment 472X3 personnel; (3) comparison of MAJCOM first-enlistment differences; and (4) assessment of the 3- and 5-skill level 472X3 STS, the 47275 STS, and the 472X3 POI.

## SURVEY METHODOLOGY

### Inventory Development

The data collection instrument for this occupational survey was USAF Job Inventory AFPT 90-472-442, dated April 1981. The job inventory contains task statements covering seven Vehicle Maintenance career ladders (AFSs 472X0 - Base Vehicle Equipment Mechanic, 472X1A/B/C/D - Special Vehicle Mechanic, 472X2 - General Purpose Vehicle Mechanic, and 472X3 - Vehicle Body Mechanic) plus the Vehicle Maintenance Superintendent (AFSC 47299) and the Vehicle Maintenance Manager (CEM Code 47200). A preliminary task list was prepared after reviewing pertinent career ladder publications and directives, tasks from previous inventories, and data from the last OSR. This preliminary task list was refined and validated through personal interviews with 17 subject-matter specialists at three bases. The resulting job inventory contained a comprehensive listing of 773 tasks grouped under 23 duty headings and a background section containing such information as grade, TAFMS, job title, work area, equipment maintained, and job interest.

### Job Inventory Administration

During the period April through October 1981, Consolidated Base Personnel Offices (CBPOs) in operational units worldwide administered the inventory to job incumbents with AFSs 472X0 (Base Vehicle Equipment Mechanic), 472X1A/B/C/D (Special Vehicle Mechanic), 472X2 (General Purpose Vehicle Mechanic), 472X3 (Vehicle Body Mechanic), 47299 (Vehicle Maintenance Superintendent), and CEM Code 47200 (Vehicle Maintenance Manager). These job incumbents were selected from a computer-generated mailing list obtained from personnel data tapes maintained by the Air Force Human Resources Laboratory (AFHRL).

Each inventory respondent first completed an identification and biographical information section, then checked each task performed in their current job. After checking all tasks performed, each member then rated each of these tasks on a nine-point scale indicating the relative time spent on that particular task as compared to all other tasks checked. The ratings ranged from one (very small amount of time spent) through five (about average time spent) to nine (very large amount of time spent).

To determine relative time spent for each task checked by a respondent, all of an incumbent's ratings are assumed to account for 100 percent of his or her time spent on the job, and are summed. Each task rating is then divided by the total task ratings and multiplied by 100. This procedure provides a basis for comparing tasks in terms of both percent members performing and average percent time spent.

The information collected was used to compare personnel based on the types of tasks they performed and the relative amount of time they spend performing the tasks. Job inventory data provided the basis for analyzing the job structure of the Vehicle Maintenance specialties and making comparisons between DAFSC groups, CONUS-overseas groups, MAJCOM groups, and job satisfaction indicators. A summary of the analyses of the

data is presented in the Occupational Survey Report (OSR) for the Base Vehicle Equipment (AFS 472X0), Special Vehicle (AFS 472X1A/B/C/D), General Purpose Vehicle (AFS 472X2), and Vehicle Body Mechanics (AFS 472X3) career ladders, AFPT 90-472-442, dated August 1982. In addition to using job inventory data for the OSR, percent members performing data for first-enlistment 472X3 specialty groups are presented in this training report along with recently collected task factor ratings.

### Task Factor Administration

Due to the complexity and size of this study, the decision was made not to collect task difficulty and training emphasis data at the same time as tasks performed data were collected. For use in this report, task difficulty and training emphasis booklets were administered to selected senior 47253 (Vehicle Body Mechanic) and 47275 (General Purpose Vehicle and Body Maintenance Supervisor) personnel during the period of April through August 1982. This information is used in a number of different analyses discussed in more detail within this report.

Task Difficulty. Each person completing a task difficulty booklet was asked to rate all inventory tasks on a nine-point scale (from extremely low to extremely high) as to relative difficulty. Difficulty is defined as the length of time required by an average member to learn to do the task. For the purposes of this report, two sets of task difficulty data were used: one for the 472X3 career ladder and one for the 47275 specialty. To obtain task difficulty ratings for the 472X3 career ladder, ratings from senior 5-skill level 472X3 respondents and from 47275 members who supervised AFS 472X3 personnel were combined. The interrater agreement (as assessed through components of variance of standard group means) for this group of 29 raters was .92, indicating very high agreement among the raters. Ratings from all 47275 members were used to obtain task difficulty ratings for the 47275 specialty. The interrater agreement for this group of 35 members was .94, also reflecting high agreement among the raters. Ratings were adjusted so tasks of average difficulty would have a 5.00 rating. The resulting data is essentially a rank ordering of tasks indicating the degree of difficulty for each task in the inventory.

Training Emphasis. Individuals completing training emphasis booklets were asked to rate tasks on a ten-point scale from no training required to extremely heavy training required. Training emphasis is a rating of which tasks require structured training for first-term personnel. Structured training is defined as training provided at resident technical schools, field training detachments (FTD), mobile training teams (MTT), formal OJT, or any other organized training method. Unfortunately, training emphasis ratings by senior 5-skill level 472X3 respondents and 47275 members who supervised AFS 472X3 personnel showed disagreement among raters. As a result of this, interrater agreement was too low to allow utilization of training emphasis data. Consequently, training emphasis ratings were not used in this report.

Task difficulty ratings provide objective information which should be used along with percent members performing data when making training decisions. Percent members performing data provide information on who and how many personnel perform the tasks, while task difficulty ratings help make

decisions on which tasks may require more training time. Using these factors in conjunction with appropriate training documents and directives, career field managers can tailor training programs to accurately reflect the needs of the user by more effectively determining when, where, and how to train first-enlistment 472X3 airmen.

#### Survey Sample

As indicated previously, the administration of the AFS 472XX job inventory, task difficulty, and training emphasis booklets involved three separate survey samples. Table 1 reflects the percentage distribution, by major command, of assigned personnel in the 472X3 career ladder as of the first half of FY1982. Also presented in this table is the percent distribution, by major command, of respondents in the final task difficulty sample.

TABLE 1  
 COMMAND DISTRIBUTION OF 472X3 TASK DIFFICULTY RATERS

<u>COMMAND</u>	<u>472X3*</u> PERCENT OF ASSIGNED (N=298)	<u>47275</u> PERCENT OF ASSIGNED (N=354)	<u>PERCENT OF TASK DIFFICULTY RATERS (N=29)</u>
TAC	22	18	28
SAC	24	19	14
USAFE	21	22	21
MAC	13	10	10
PACAF	5	9	17
AAC	4	2	0
ATC	2	8	7
AFSC	3	5	3
OTHER	<u>6</u>	<u>7</u>	<u>0</u>
TOTAL	100	100	100

\*AFSC 472X3 INCLUDES ALL 3- AND 5-SKILL LEVEL PERSONNEL

## ANALYSIS OF FIRST-ENLISTMENT PERSONNEL

Before efficient and cost-effective training programs can be designed for a career ladder, the jobs and tasks performed by personnel within the career ladder must be defined. Of particular importance are the jobs and tasks performed by first-enlistment personnel since they are the "target" for basic skills training. Thus, this report will focus on the tasks performed by first-enlistment personnel.

To determine the basic functions performed by first-enlistment (1-48 months TAFMS) Vehicle Body Mechanics, an analysis of the tasks, jobs, vehicles maintained, and tools and equipment used by these members was performed. Additionally, since major command (MAJCOM) assignment is another possible dimension along which jobs performed by respondents could vary, a comparison of the tasks performed and vehicles maintained by various first-enlistment MAJCOM groups was made. These data can help identify training needs for first-term Vehicle Body personnel.

### AFS 472X3 First-Enlistment Personnel

Tasks and Jobs Performed. First-enlistment Vehicle Body mechanics spent a substantial portion (62 percent) of their job time repairing and painting vehicle bodies, with an additional 20 percent of their job time devoted to performing general maintenance and metal working tasks. Very little of their job time was spent repairing any of the various vehicle systems, making their job very different from members in other vehicle maintenance specialties. Typical tasks performed by first-enlistment Vehicle Body Mechanics include preparing for and painting vehicles; inspecting, removing, installing, adjusting, straightening, and repairing body parts; mending and replacing upholstery; cutting and installing glass; and welding of various metals using oxyacetylene and electric arc methods (see Table 2 for a more comprehensive display of representative tasks).

Figure 1 displays the distribution of first-term 472X3 members across the job groups identified in the JOB STRUCTURE ANALYSIS section of the Base Vehicle Equipment, Special Vehicle, General Purpose Vehicle, and Vehicle Body Mechanic OSR. As shown in this figure, the majority (93 percent) of first-enlistment 472X3 personnel grouped together in the Vehicle Body Repair Personnel Cluster. Additionally, this distribution of first-term members across specialty jobs, reflects the fact that most 472X3 first-enlistment members (81 percent) perform essentially the same basic job with only limited numbers working in jobs involving supervisory functions or maintenance of various vehicle systems.

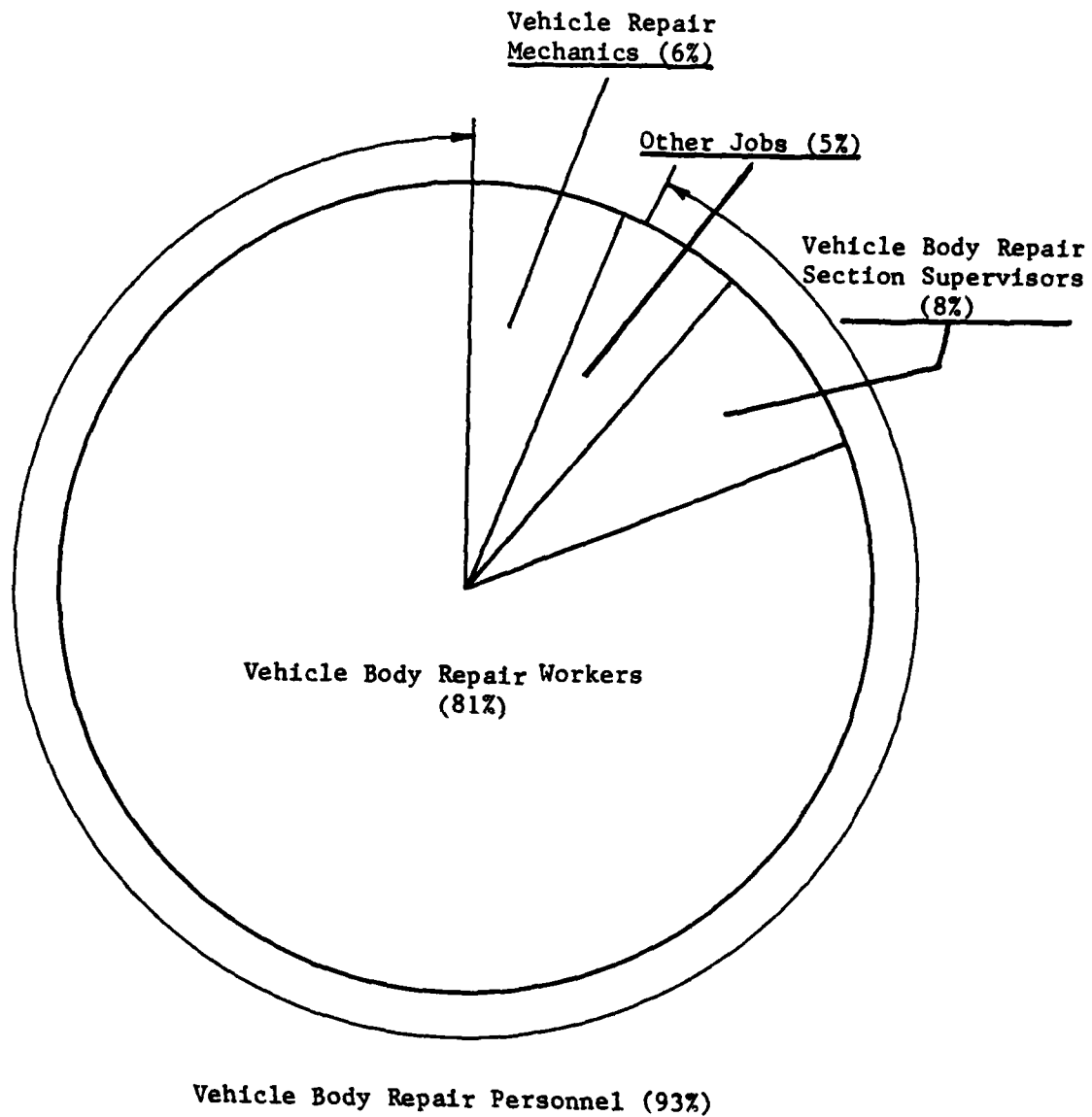
Vehicles Maintained. First-enlistment 472X3 members repaired and maintained vehicle bodies on a wide variety of different vehicles with the majority of members working on general purpose and base vehicles. Some of the more common general purpose vehicles repaired by first-enlistment personnel include ambulances, buses, pick-up trucks, staff cars or sedans, and step-van trucks. Additionally, these members repaired the bodies on some of the base vehicles such as dump trucks, farm tractors, telephone maintenance trucks, magnetic sweepers, and wreckers. Body work on fire-

TABLE 2

REPRESENTATIVE TASKS PERFORMED BY FIRST-ENLISTMENT  
(1-48 MONTHS TAFMS) 472X3 PERSONNEL

TASKS	PERCENT MEMBERS PERFORMING (N=101)
V742 APPLY LETTERING OR IDENTIFYING INSIGNIAS TO VEHICLE BODIES	94
V741 APPLY BODY FILLERS	93
V743 APPLY PRIMERS	92
V755 PREPARE VEHICLE BODY SURFACES FOR PAINTING	92
V740 ADJUST HINGES OR LOCKING MECHANISMS	92
V745 APPLY WEATHER STRIPPING TO BODY PARTS	91
V753 PAINT VEHICLE BODY SURFACES	90
V754 PREPARE PAINT FOR PAINTING	90
V750 INSTALL CURVED GLASS	89
V761 REMOVE OR INSTALL LOCKS OR LATCHES	89
V767 REMOVE OR INSTALL WINDOW REGULATORS	89
V772 STRAIGHTEN DISTORTED PANELS, DOORS, OR FENDERS	89
V762 REMOVE OR INSTALL METAL BODY PARTS SUCH AS DOORS, FENDERS, OR FLOORS	88
G197 OPERATE CUTTING TORCHES	88
V748 CUT SAFETY GLASS	87
V751 INSTALL NONCURVED GLASS	86
V760 REMOVE OR INSTALL HINGES	86
V766 REMOVE OR INSTALL WINDOW CHANNELS	86
V759 REMOVE OR INSTALL BUMPERS	85
V763 REMOVE OR INSTALL UPHOLSTERY	83
V749 INSPECT DAMAGED BODY SECTIONS	82
V765 REMOVE OR INSTALL VEHICLE MOLDINGS	81
V771 SHRINK OR STRETCH DAMAGED METAL AREAS	81
G191 HEAT STRAIGHTEN BENT OR TWISTED METAL PARTS	81
G200 OXYACETYLENE-WELD SHEET METAL	79
G183 ARC-WELD MILD STEEL	77
G186 BRAZE SHEET METAL	76
G214 WELD EXHAUST SYSTEM COMPONENTS	75
V769 REPAIR RADIATOR OR HEATER CORE LEAKS	73
V752 MEND UPHOLSTERY	72
V756 PRESSURE TEST RADIATORS	71
V758 REBUILD SEAT FRAMES	71
G203 PERFORM SOFT SOLDERING	67
G196 MECHANICALLY STRAIGHTEN BENT OR TWISTED METAL PARTS	62
V744 APPLY UNDERCOATING TO VEHICLE BODIES	62

FIGURE 1  
DISTRIBUTION OF 472X3 FIRST-ENLISTMENT PERSONNEL  
ACROSS CAREER FIELD JOBS  
(PERCENT MEMBERS RESPONDING)  
(N=101)





fighting, refueling, materials handling, and towing and servicing vehicles was also performed, although to a lesser degree, by some of these first-term members (specific vehicles repaired by 472X3 first-enlistment members are presented in the Training Extract for this report). The vehicle maintained data and the percent members performing data indicate training should concentrate on the repair of vehicle bodies across a wide variety of vehicles.

Tools and Equipment Used. Of the first-enlistment 472X3 members, 86 percent indicated using some type of maintenance tools or equipment in the performance of their present job. Out of the 17 specific tools or equipment listed in the inventory, only two were used by ten percent or more of the Vehicle Body Repair first-enlistment personnel. Specifically, 46 percent of the members indicated using gas shielded welding equipment and 32 percent indicated that they use manual or hydraulic presses in their present job. These are mentioned here to assist trainers in assessing maintenance tools and equipment that might best be used or taught in courses.

#### Analysis of First-Enlistment MAJCOM Differences

Tasks performed and vehicles maintained by personnel within the five major commands (MAJCOM) with the largest first-enlistment 472X3 population were compared to determine whether job content varied as a function of MAJCOM assignment. The five commands examined in this analysis included TAC, SAC, USAFE, MAC, and PACAF.

Tasks Performed. Generally, personnel within each of the commands were devoting similar amounts of time to the performance of tasks pertaining to repairing and painting vehicle bodies and general maintenance and metal working. A review of the specific tasks performed by the first-enlistment MAJCOM groups revealed no substantial differences in the overall jobs performed across the various commands. By and large, personnel perform essentially the same vehicle body repair work regardless of the command to which they are assigned.

Vehicles Maintained. In terms of types and number of vehicles maintained, only minor differences between the five commands were found. First-enlistment personnel assigned to PACAF were repairing vehicles bodies on less of a variety of vehicles than members in the other four commands. These differences, however, were small and did not reflect major differences in the jobs performed across the commands (specific vehicles maintained data can be found in the Training Extract for this report).

The majority of 472X3 first-term personnel assigned to the various MAJCOMs perform a job that is very similar with most airmen performing the same vehicle repair tasks on similar types of vehicles. In terms of training, any differences noted between the MAJCOM groups were minor and probably can be handled effectively through local OJT programs.

## TRAINING ANALYSIS

Occupational survey data are one of many sources of information which can be used to assist in the development of a training program relevant to the needs of personnel working in their first assignment within a career ladder. Factors which may be used in evaluating training are the percent of first-job (1-24 months TAFMS) or first-enlistment (1-48 months TAFMS) members performing tasks, along with training emphasis ratings and task difficulty ratings. Unfortunately, in the case of the 472X3 specialty, training emphasis raters did not agree to an acceptable degree on which tasks should be trained (previously explained in the TASK FACTOR ADMINISTRATION section). No systematic trends could be identified which would account for the lack of agreement among the 472X3 training emphasis raters. Because of this lack of agreement, training emphasis ratings could not be used to evaluate the 472X3 training documents. Only percent members performing tasks and task difficulty were used to evaluate the Specialty Training Standard (STS) and the Plan of Instruction (POI) for the 472X3 career ladder. Technical school personnel from the US Army Ordnance Center and School, Aberdeen Proving Grounds, Maryland, matched inventory tasks to appropriate sections of the AFS 472X3 STS and POI for interservice course 704-47233. Additionally, personnel from the Chanute Technical Training Center, Chanute AFB, Illinois, matched inventory tasks to appropriate sections of the AFS 47275 STS. It was these matchings upon which comparisons are based. It should be noted that comments and tables presented in this section pertaining to questionable elements (or lack of elements) in the training documents are intended to highlight what appear to be possible problem areas. A complete computer listing reflecting the percent members performing and task difficulty ratings for each task, along with STS and POI matchings, has been forwarded to the technical school for their use in further detailed reviews of training documents.

### 3- and 5-Skill Level Specialty Training Standard (STS)

A review of STS 47233/53, dated April 1981, compared STS sections to survey data. Paragraphs containing general information or subject-matter proficiency requirements were not evaluated. The STS generally provides comprehensive coverage of the jobs performed by 3- and 5-skill level personnel in the field, with survey data supporting significant paragraphs or subparagraphs.

In some cases, the tasks matched to a particular STS item did not have high numbers of first-enlistment or 5-skill level personnel performing them. These STS areas were related to maintenance data collection forms; man-hour accounting reports; storage and shipment of vehicles; frame alignment; removing and replacing heater cores; and welding metals with metallic arc equipment. Table 3 lists tasks performed by less than 30 percent of the 472X3 first-enlistment and 5-skill level personnel with STS skill level or training code levels in need of review. Career field managers and training personnel should review these areas of the STS to reaffirm the appropriateness of code levels assigned for 5-skill level career ladder personnel.

TABLE 3

TASKS PERFORMED BY LESS THAN 30 PERCENT OF 472X3  
FIRST-ENLISTMENT AND 5-SKILL LEVEL PERSONNEL  
(SUGGESTED FOR STS CODE LEVEL REVIEW)

STS REFERENCE	TASKS	5-SKILL LEVEL STS CODE	TASK DIFFICULTY*	PERCENT MEMBERS PERFORMING	
				FIRST- ENLISTMENT (N=101)	DAFSC 47253 (N=170)
7b/7d	E155 POST ENTRIES TO VEHICLE AND EQUIPMENT WORK ORDER FORMS (AF FORM 1823)	3c	3.79	15	27
7b/7d	E146 POST ENTRIES TO INDIRECT MANHOURLS LABOR TIME CARD FORMS (AF FORM 1831)	3c	3.45	9	22
7d	E149 POST ENTRIES TO MINOR MAINTENANCE WORK ORDER FORMS (AF FORM 1827)	3c	3.47	10	25
9b	G204 PREPARE VEHICLES FOR STORAGE	2b	4.10	20	22
12	V773 STRAIGHTEN VEHICLE FRAMES	3c	8.97	27	23
16b(2)	L421 REMOVE OR INSTALL HEATER CORES	3c	4.90	6	11
18b(2)	G187 BUILD UP WORN TRACK COMPONENTS	3c	6.72	11	13

\* TASK DIFFICULTY RATING OF 5.00 IS AVERAGE

A number of paragraphs in the STS with task performance proficiency codes assigned did not have inventory tasks matched to them (see Table 4). This could mean that an applicable task has not been matched, the element is inappropriately coded as a performance item rather than a knowledge item, or there are no clearly defined inventory tasks appropriate to that element. Subject-matter specialists and training personnel should review these elements in detail to assure that inclusion in the STS is justified. If that is the case, the possible reason for the unmatched elements discussed above should be pursued and necessary adjustments made. (If it is determined there are no tasks in the inventory which can be matched to a valid performance element, it is requested that the subject-matter specialists draft the appropriate task statements and forward them to the Occupational Measurement Center for review and use in the next inventory rewrite.)

Tasks not matched to any element of the STS and performed by 20 percent or more of the first-enlistment or 5-skill level personnel are displayed in Table 5 (additional tasks not referenced can be found at the end of the STS computer printout in the AFS 472X3 Training Extract). These were reviewed to determine if they were concentrated around a common function. Generally, no particular trends or functional groupings of these tasks were noted. Subject-matter specialists and training personnel should evaluate these tasks to determine if coverage in the STS is justified.

#### 47275 Specialty Training Standard (STS)

Since the General Purpose Vehicle Mechanic (AFS 472X2) and Vehicle Body Mechanic (AFS 472X3) specialties merge at the 7-skill level into AFSC 47275, there is a separate STS for 7-skill level members. Therefore, in addition to reviewing the 3- and 5-skill level STS, the 47275 STS, dated November 1981, was reviewed, comparing STS items to survey data. Generally, the 47275 STS provides comprehensive coverage of the significant jobs performed by 7-skill level personnel. The STS items dealing with supervisory, managerial, and administrative functions were supported by percent members performing data. Besides these supervisory and management tasks, 7-skill level personnel perform a wide variety of technical tasks, although many of these technical tasks were performed by a low percentage of members. The portion of the STS related to the technical jobs performed by 47275 personnel provides thorough coverage of the technical tasks performed by these members. Many tasks matched to a particular STS item, however, did not have high numbers of 7-skill level members performing them. These STS areas dealt with such items as diesel fuel systems, power shift transmissions, air-conditioning equipment, repairing of body components, and refinishing metal surfaces. Table 6 displays example tasks performed by less than 30 percent of DAFSC 47275 members and the STS items to which these tasks were matched. Other elements with low percent members performing include subparagraphs within items 4 and 5 plus additional subparagraphs within items 9, 11, and 12. Because this is a 7-skill STS, the high proficiency codes may be warranted since 7-skill level members may supervise performance of these items. Career field managers, training personnel, and subject-matter specialists, however, should review these areas of the STS to reaffirm the appropriateness of proficiency code levels assigned for 7-skill level personnel.

TABLE 4

## STS ELEMENTS WITHOUT MATCHING TASKS

STS ELEMENTS	PROFICIENCY CODES	
	3- SKILL LEVEL	5- SKILL LEVEL
4d Maintain technical order publication files	-	2b
5a Cross-reference part numbers and stock numbers	-	2b
7e Use man-hour accounting reports	-	2b
9a Winterize vehicles	b	3c
10 Use tools and test equipment	2b	3c
11b(5) Remove grill	2b	3c
11c(5) Prepare filled areas afor painting	2b	3c
11d(5) Replace and align grill	2b	3c
13b(3) Perform required maintenance on bumpers	2b	3c
15b(6) Prepare for application corrosion control materials	2b	3c
16b(3) Remove and replace oil coolers	2b/-	3c
16b(4) Remove and replace heat exchangers	2b/-	3c
16c(2) Test and repair heater cores	2b/-	3c
16c(3) Test and repair oil coolers	2b/-	3c
16c(4) Test and repair heat exchangers	2b/-	3c
17c Repair fuel tank	2b	3c
18b(3) Weld metals with tungsten inert gas equipment	2b	3c

TABLE 5  
 TASKS NOT REFERENCED TO 472X3 STS  
 (20 PERCENT OR MORE PERFORMING)

TASKS	TASK DIFFICULTY*	PERCENT MEMBERS PERFORMING	
		FIRST- ENLISTMENT (N=101)	DAFSC 47253 (N=170)
G181 ARC-WELD CAST IRON	7.52	56	56
G182 ARC-WELD GALVANIZED METAL	7.15	58	55
V768 REPAIR FIBER GLASS COMPONENTS	6.13	53	52
C72 ANALYZE CAUSES OF VEHICLE FAILURES	6.08	20	25
E160 PREPARE VEHICLE REPAIR ESTIMATES	5.45	15	29
G206 REMOVE BROKEN STUDS OR CAP SCREWS	4.92	24	28
C77 CONDUCT VEHICLE LIMITED TECHNICAL INSPECTION (LTI)	4.60	11	25
C99 INSPECT TOOLS	4.15	37	51
C110 ROAD TEST VEHICLES	4.07	28	35
G193 LUBRICATE VEHICLES	3.77	9	20
I311 REMOVE OR INSTALL VEHICLE LIGHT ASSEMBLIES	3.53	17	22
I288 REMOVE OR INSTALL BATTERIES	2.66	18	21

\* TASK DIFFICULTY RATING OF 5.00 IS AVERAGE

TABLE 6

SAMPLE TASKS PERFORMED BY LESS THAN 30 PERCENT OF DAFSC 47275 PERSONNEL  
(SUGGESTED FOR STS CODE LEVEL REVIEW)

STS REFERENCE	TASKS	7-SKILL LEVEL STS CODE	TASK DIFFICULTY*	PERCENT
				DAFSC 47275 PERFORMING (N=280)
9a(1)	V744	4c	4.68	10
9a(2)	G21	4c	5.31	12
11e	K362	4c	7.45	3
11e	K373	4c	6.62	6
11e	K365	4c	5.95	9
11e	K391	4c	5.76	3
11e	K392	4c	5.43	3
11e	K394	4c	4.39	5
11e	K377	4c	4.10	9
11e	K390	4c	3.95	18
11e	K385	4c	3.81	21
11g(6)	M456	4c	5.13	10
11g(6)	M443	4c	5.11	6
11k	G188	4c	5.82	7
11k	M437	4c	5.23	9
11k	G211	4c	4.86	6
12a(1)	V762	4c	5.00	17
12a(1)	V765	4c	3.97	15
12a(1)	V761	4c	3.88	22
12a(1)	V759	4c	3.05	17
12d(2)	V750	4c	5.09	15
12d(2)	V766	4c	4.18	14
12d(2)	V751	4c	4.17	19

\* TASK DIFFICULTY RATING OF 5.00 IS AVERAGE

Paragraphs in the STS with task performance proficiency codes assigned and not having inventory tasks matched to them included:

- 9a(4) Prepare vehicles for shipment
- 12b Check frame alignment
- 12e(3) Weld metals and alloys with gas shielded welding equipment

These items may have no matched tasks because the applicable task was overlooked in the matching process, the element is inappropriately coded as a performance item, rather than a knowledge item, or there are no clearly defined inventory tasks appropriate to that element. These items should be reviewed in detail by subject-matter specialists and training personnel to determine if inclusion in the STS is justified. (If no tasks in the inventory can be matched to a valid STS performance element, it is requested that subject-matter specialists draft the appropriate task statements and forward them to the Occupational Measurement Center for review and use in the next inventory rewrite.)

Finally, tasks displayed in Table 7 were not matched to any STS element and are performed by 10 percent or more of the DAFSC 47275 personnel. Generally, most of these tasks were related to performing section maintenance and control and administrative functions, performing supply functions, and repairing tires. The tasks listed in Table 7 should be reviewed by subject-matter specialists to determine if they should be included during the next STS revision.

#### Plan of Instruction (POI)

Based on previously mentioned assistance from technical school subject-matter specialists in matching inventory tasks to the interservice 704-47233 POI, dated March 1982, a computer product was generated displaying the results of the matching process. Information furnished includes task difficulty (TD), as well as percent members performing data for first-job (1-24 months TAFMS) and first-enlistment (1-48 months TAFMS) personnel.

Many POI blocks and objectives appear to be supported by survey data based on percentages of first-term personnel performing tasks. An analysis of the percent members performing data, however, indicates that first-job or first-enlistment 472X3 incumbents are receiving training on some tasks which a relatively small portion of the respondents actually perform. As shown in Table 8, objectives in annexes pertaining to welding oxyacetylene (Annex BA), radiator testing, cleaning, and repair (Annex CB), fuel tank repair (Annex CD), and Air Force publications (Annex CF) do not appear to be supported by the data. All of the tasks identified have less than 30 percent of the first-enlistment population performing and are rated average or below average in task difficulty. If, due to the nature of the tasks, structured training is judged necessary on the objectives listed in Table 8, regardless of the low percent members performing, it may be more appropriate to shift training on these tasks from the resident course to OJT.



TABLE 7

TASKS NOT REFERENCED TO STS 47275\*  
(10 PERCENT OR MORE 47275 PERSONNEL PERFORMING)

TASKS

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G195 MANUFACTURE SPECIAL TOOLS  
K369 INTERPRET EMISSION CONTROL SYSTEM DIAGRAMS OR SCHEMATICS  
E141 EDIT COMPUTERIZED MAINTENANCE LISTINGS  
F165 COORDINATE WITH BASE SUPPLY TO RESOLVE SUPPLY PROBLEMS  
V768 REPAIR FIBERGLASS COMPONENTS  
F176 VERIFY CONTRACT OPERATED AUTOMOTIVE PARTS STORE TRANSACTIONS  
I271 INTERPRET ELECTRICAL SYSTEM DIAGRAMS OR SCHEMATICS  
G202 PERFORM SILVER SOLDERING  
F166 ESTABLISH INVENTORIES OF HIGH TURNOVER ITEMS  
E145 MAINTAIN WORK CONTROL LOGS OR WORK STATUS BOARDS  
F177 VERIFY DUE-IN FROM MAINTENANCE (DIFM) DOCUMENT LISTINGS (R-26)  
F170 MAINTAIN DEFERRED OR DELAYED PARTS BOARDS OR RECORDS  
E142 INITIATE VEHICLE ACCIDENT OR ABUSE LETTERS  
V763 REMOVE OR INSTALL UPHOLSTERY  
E161 PREPARE VEHICLE STATUS REPORTS  
V752 MEND UPHOLSTERY  
G203 PERFORM SOFT SOLDERING  
E163 REVIEW VEHICLE HISTORICAL RECORD DATA FOR WARRANTY, SCHEDULED  
MAINTENANCE, OR REPETITIVE MAINTENANCE  
E169 ISSUE STOCKS OF HIGH VALUE ITEMS  
P558 DISMOUNT OR MOUNT HEAVY DUTY TIRES  
E156 POST ENTRIES TO VEHICLE HISTORICAL RECORD FORM (AF FORM 1828)  
M448 MANUFACTURE SPEEDOMETER CABLES  
E152 POST ENTRIES TO RECORD OF CANNIBALIZATION (VEHICLE MAINTENANCE)  
FORMS (AF FORM 1832)  
G210 REMOVE OR INSTALL V-BELT PULLEYS  
N499 REMOVE OR INSTALL FRONT WHEEL BEARINGS  
N484 PACK WHEEL BEARINGS  
P559 DISMOUNT OR MOUNT LIGHT DUTY TIRES  
M460 REMOVE OR INSTALL SPEEDOMETER CABLE ASSEMBLIES  
P566 PERFORM TIRE BUBBLE BALANCING  
P568 PLUG TIRES  
P561 HOT PATCH TUBES  
P557 COLD PATCH TUBES  
P565 LEAK TEST TIRES OR TUBES  
I316 SERVICE BATTERY CARRIER ASSEMBLIES  
P570 REMOVE OR INSTALL VALVE STEMS

\*SUPERVISORY, MANAGERIAL, AND TRAINING TASKS HAVE BEEN OMITTED.

TABLE 8

POI BLOCKS REFLECTING PERFORMANCE BY A LOW PERCENTAGE  
OF 472X3 FIRST-ENLISTMENT PERSONNEL  
(LESS THAN 30 PERCENT MEMBERS PERFORMING)

POI REFERENCE	TASKS	TASK DIFFICULTY*	PERCENT MEMBERS PERFORMING	
			FIRST- JOB (N=54)	FIRST- ENLISTMENT (N=101)
BA-5	G187 BUILD UP WORN TRACK COMPONENTS	6.72	7	11
CB-4/5	I418 REMOVE OR INSTALL BAFFLES OR SHROUDS	4.04	2	3
CD-2/3	K388 REMOVE OR INSTALL FUEL TANKS	3.59	9	11
CF-1	G213 RESEARCH TECHNICAL PUBLICATIONS	5.24	15	20
CF-1	F175 RESEARCH FEDERAL STOCK NUMBERS OR PART NUMBERS	5.24	13	19
CF-1	E149 POST ENTRIES TO MINOR MAINTENANCE WORK ORDER FORMS (AF FORM 1827)	3.47	7	10
CF-1	E155 POST ENTRIES TO VEHICLE AND EQUIPMENT WORK ORDER FORMS (AF FORM 1823)	3.79	13	15
CF-1	E148 POST ENTRIES TO LIMITED TECHNICAL INSPECTION MOTOR VEHICLES FORMS (AFTO FORM 91)	3.71	2	2
CF-1	E144 MAINTAIN TECHNICAL ORDER FILES	5.24	6	6
CF-1	E146 POST ENTRIES TO INDIRECT MANHOURS LABOR TIME CARD FORMS (AF FORM 1831)	3.45	7	9
CF-1	E156 POST ENTRIES TO VEHICLE HISTORICAL RECORD FORMS (AF FORM 1828)	3.73	2	2
CF-1	E143 MAINTAIN CORRESPONDENCE OR PUBLICATIONS FILES	5.37	4	3

\* TASK DIFFICULTY RATING OF 5.00 IS AVERAGE

A number of objectives within the POI either did not have tasks matched to them, or the same tasks were matched to numerous objectives within an annex. For instance, in the annex related to welding oxyacetylene (Annex BA), 23 of the 35 Air Force applicable objectives did not have tasks matched to them. Additionally, of the 12 objectives with matched tasks, some of the same tasks were matched to more than one objective. This could mean that there are no clearly defined inventory tasks appropriate to the different objectives or an applicable task has not been matched. Subject-matter specialists and training personnel should review these objectives in detail to assure that inclusion in the POI is justified. If it is determined that there are no tasks in the inventory which can be matched to a valid objective, it is requested that the subject-matter specialists draft the appropriate task statements and forward them to the Occupational Measurement Center for review and use in the next inventory rewrite.

Finally, some tasks with 30 percent or more first-job or first-enlistment personnel performing were not matched to POI blocks. These were reviewed to determine if they were concentrated around a common function. As shown in Table 9, four of the fourteen tasks were related to either upholstery work or seat covers and frames with three of the tasks relating to welding functions. Of the remaining seven tasks, there were no other trends or functional groupings noted. The high percent members performing data, coupled with high task difficulty on some of these tasks, indicates that formal training may be required and that resident technical training could be supported.

Subject-matter specialists and training personnel should further evaluate the subject areas and tasks discussed above in an effort to resolve the necessity for training and the most effective method to accomplish it.

TABLE 9

TASKS NOT REFERENCED TO 704-47233 POI OBJECTIVES  
(30 PERCENT OR MORE PERFORMING)

TASKS	TASK DIFFICULTY*	PERCENT MEMBERS PERFORMING	
		FIRST- JOB (N=54)	FIRST- ENLISTMENT (N=101)
V740 ADJUST HINGES OR LOCKING MECHANISMS	4.52	89	92
V760 REMOVE OR INSTALL HINGES	3.39	83	86
V763 REMOVE OR INSTALL UPHOLSTERY	4.90	80	83
G191 HEAT STRAIGHTEN BENT OR TWISTED METAL PARTS	5.78	80	81
V752 MEND UPHOLSTERY	4.46	70	72
V758 REBUILD SEAT FRAMES	4.89	67	71
V746 CONSTRUCT SEAT COVERS	6.33	59	63
G182 ARC-WELD GALVANIZED METAL	7.15	56	58
G181 ARC-WELD CAST IRON	7.52	48	56
V768 REPAIR FIBERGLASS COMPONENTS	6.13	44	53
V747 CONSTRUCT WOODEN BODY PARTS	4.95	37	48
C99 INSPECT TOOLS	4.15	24	37
G198 OXYACETYLENE-WELD ALUMINUM	7.85	35	36
G195 MANUFACTURE SPECIAL TOOLS	6.56	24	30

\*TASK DIFFICULTY RATING OF 5.00 IS AVERAGE

## SUMMARY AND IMPLICATIONS

The data reported in this study were collected to help Air Force decision makers address the training needs of the Vehicle Body Mechanic specialty. These data were compared with occupational information from the August 1982 Base Vehicle Equipment (AFS 472X0), Special Vehicle (AFS 472X1A/B/C/D), General Purpose Vehicle (AFS 472X2), and Vehicle Body Mechanic (AFS 472X3) OSR to review the present training programs.

In determining training requirements, tasks performed and vehicles maintained by first-enlistment personnel need to be carefully considered. A close examination of the tasks and jobs performed, vehicles maintained, and tools and equipment used by 472X3 first-enlistment members showed these members performing a job which is distinctly different from other vehicle mechanics. All 472X3 first-term members perform essentially the same basic job involving the repair of vehicle bodies on a wide variety of different vehicles. From the data, it would appear that training for Vehicle Repair Mechanics should cover all aspects of vehicle body repair on a variety of vehicles.

Unfortunately, training emphasis ratings could not be used, due to the lack of acceptable agreement among the raters. Therefore, the current 47233/53 STS, 47275 STS, and POI for Interservice Course 704-47233 were reviewed using primarily percent members performing data. Generally, these documents were consistent with tasks performed with a few exceptions. Recommendations were made for possible additions to the STSs, as well as suggestions for adjustments in skill-level codes. In terms of the POI, there are some tasks performed by a large number of first-enlistment personnel which are not covered in the current resident technical training course. Additionally, some objectives either were not supported by survey data, or could not be fully evaluated because they did not have tasks matched to them. Subject-matter specialists and training personnel should review these areas of the training documents to determine if changes need to be made.

One important issue which should be addressed is the question of utilization of DAFSC 47275 personnel. As stated in the August 1982 OSR, merger of the 472X2 and 472X3 specialties at the 7-skill level may not be functioning as expected. Previous experience, as represented by career ladder progression, appears to be affecting the utilization of DAFSC 47275 personnel. A Utilization and Training workshop on all the vehicle maintenance specialties may be necessary to address this issue and other utilization issues within the vehicle maintenance career field, and also to assess current and projected training needs and programs.

**END**

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