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MINISTRY OF EDUCATION,  
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UNIVERSITY  
OF DEFENCE

INVESTMENTS IN EDUCATION DEVELOPMENT

## Studijní opora AJ Lesson plan

**Course Name:** Management services of military equipment operation and material

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# **T1 Kinds and categories of military vehicles, armed forces vehicle registration**

## **Introduction**

*All components of the armed forces are using to their activities larger or smaller number of road, combat, support or special vehicles. A necessary condition for their proper use and effective use is the knowledge of their tactical and technical parameters, the principles of use during fulfilling different transport tasks, maintenance organization and park services. Due to the past significant legislative and organizational changes in the system of service of vehicles in the AČR, resulted in actual need of correct interpretation of the relevant provisions*

### **1.1 Armoured vehicles**

Armored vehicles are road motor vehicles and trailers and military vehicles that are registered under military license plates.

*Note.* Some of the identified road motor vehicles and trailers of the armed forces may be registered under state registration number (for instance: Vehicles Military Intelligence)

### **1.2 Military vehicles and requirement for military vehicles**

*Basic requirements for military vehicles arising from the required capabilities of units that are equipped with these vehicles. According to the intended task, which will the unit fulfil can specified the specific requirements of its equipment.*

Important requirements are: 1. firepower, 2. protection, 3. mobility, 4. operational and technical characteristics

### **1.3 Requirements for support vehicles**

The most important requirements of a military safety (service) vehicles currently include: utility properties and operation economy; good handling on-roads and off-road; safe and ecological service; reliability and durability; Simple and compact design (max. using commercially available parts and components); easy maintenance and repairs without special training; low curb weight a operational compatibility with other alliance devices.

## 1.4 The categorization of military vehicles

Dividing according to the:

- a) according to the regulation on management of the property - now the order of the Ministry of Defence
- b) according to decree MO č. 274/1999 Sb
- c) according to special arrangements and agreements

## 1.5 The categorization of military vehicles according to purpose

Motorbikes (including „quads“); automobiles; combat vehicles ○ tanks, ○ armoured transporters, ○ infantry fighting vehicle, ○ combat vehicle with heavy equipment, ○ another combat vehicles;  
Special vehicles.

## 1.6 Combat vehicles of AČR

Tank T-72 M4CZ, BVP-2, BRDM-2, OT-64, DINGO, IVECO, PANDUR II

## 1.7 Support vehicles of AČR

*ACR uses for fulfilling transport and special tasks normal road vehicles and also off-road vehicles and special vehicles. The most common include personal terrain vehicles UAZ 469 series and Land Rover 90, 110, 130, the trucks are vehicles as P V3S especially for special purposes - workshops etc, T 815 in different varieties and designs. New vehicles T 810.*

## The tasks for students:

Repeat categorization of vehicles according to Regulations 274/1999 Sb

## References and further reading:

*Literature:*

- [1] Zákon č. 219/1999 Sb. ze dne 14.9.1999 o ozbrojených silách České republiky.
- [2] Č.j.: 6272-2/2006/DP-3042. Směrnice pro používání pozemní vojenské techniky AČR v míru. Praha: GŠ AČR, 2006.
- [3] Normativní výnos MO 6.6. 2013 Postupy při hospodaření a nakládání s majetkem v působnosti Ministerstva obrany
- [4] Vyhláška MO č. 274/1999 Sb. ze dne 15.11.1999, kterou se stanoví druhy a kategorie vojenských vozidel, schvalování jejich technické způsobilosti, provádění technických prohlídek vojenských vozidel a zkoušek technických zařízení vojenských vozidel.
- [5] Smlouva o konvenčních ozbrojených silách v Evropě. (překlad). Praha: MO, 1990.
- [6] Zákon č. 56/2001 Sb., o podmínkách provozu vozidel na pozemních komunikacích a o změnách některých zákonů.

## T2 - The use of MG equipment and other techniques

### Introduction

Since year 2008 ACR gradually introduced into selected units new wheeled vehicles DINGO, IVECO and since year 2009 wheeled infantry fighting vehicle PANDUR II. ACR for transport and special tasks addition to using normal road vehicles also off-road and special vehicles. The most common are terrain vehicles UAZ 469 series and Land Rover, the trucks are vehicles V3S P and T 815 in different varieties and designs. Vehicles P V3S was gradually replaced by vehicles T 810.

Securing efficient and correct use of technology within the limits of technical standards, valid laws, commands, regulations and other internal normative acts, as well as maintaining its continuous operability is the goal of traffic engineering

### 2.1 Structure of wheeled and tracked vehicles, and the basic logistics data

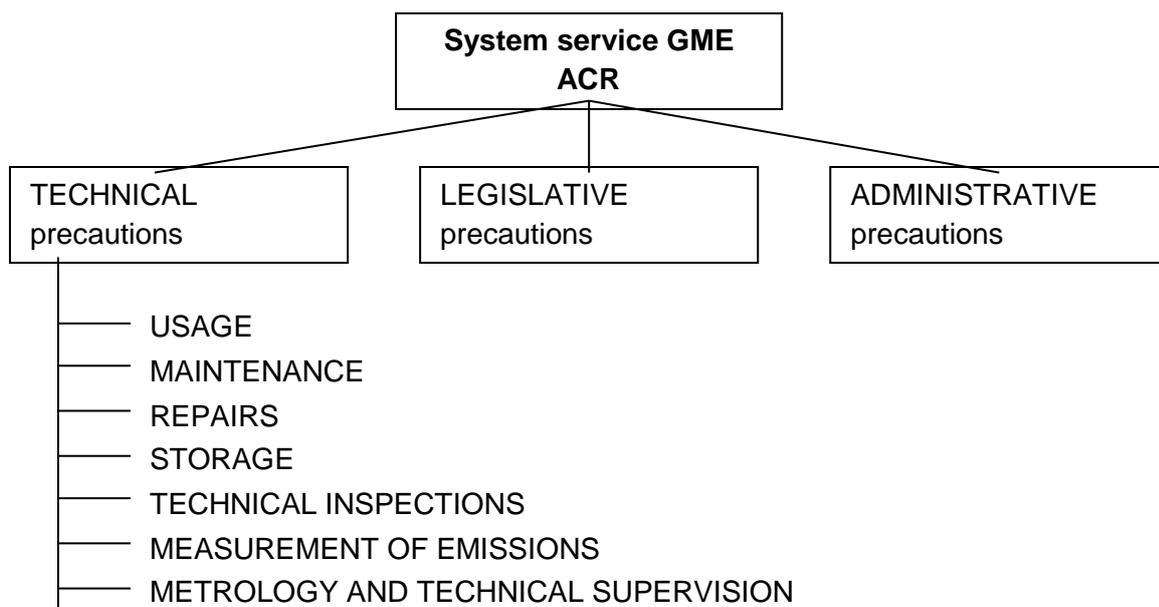
Kinematic diagram of the wheeled and tracked vehicles

- The areas and parts of the vehicle
- Chassis and its parts
- Engine and engine systems
- Clutch
- Transmission, auxiliary transmission

### 2.2 Vehicle service and definition in ACR

Operation of military equipment is a system of technical, legislative and administrative measures to ensure its use in the MO.

### 2.3 System service PVT in ACR.



## **2.4 Basic terms - operating unit, mileage of equipment**

- Operating unit(Pj);
- Mileage (work) of equipment
- Between-repair standardization
- Supply (Pj) – remaining to TU or to schedule repairs
- Durability

### **The tasks for students:**

- Complete information on recommended vehicles used in ACR
- Repeat the definition of operation and basic terms

### **References and further reading:**

- [1] Zákon č. 361/2000 Sb. o provozu na pozemních komunikacích ve znění pozdějších předpisů (včetně zákona č. 411/2005 Sb.), zákonem č. 56/2001 Sb. o podmínkách provozu vozidel na pozemních komunikacích.
- [2] Všeob-P-37.
- [3] Směrnici pro používání PVT AČR v míru (č.j.: 6272-2/2006/DP-3042)

## **T 3 - The use of MGE equipment and other techniques**

### **Introduction**

Using equipment in the peace time must be organized in accordance with the plan of combat training, in accordance with current laws, orders and regulations, and always within the limits of the applicable operating standards.

The equipment can be used only according to the producers specified condition, within specified parameters and for the purposes for which it is made and designed in the peace time.

### **3.1 The use of military equipment in peace time, the definition of use**

The valid command for using a equipment is main term of use.

Using equipment of peace must be organized in accordance with the plan of combat training, in accordance with current laws, orders and regulations, and always within the limits of the applicable operating standards.

### **3.2 Conditions for use of vehicles**

- Approved the technical competence to operate,
- is introduced into use and registered in accordance with the RMO No.9 / 03,
- it is used exclusively in the prescribed manner by authorized persons who have been assigned to use this vehicle,
- it is used within the specified condition, within the limits of technical standards and the purpose for which it is intended,
- it is equipped with an military license plate (combat vehicles marked with numbers).

### **3.3 The classification of equipment to the groups**

According to the character of the use, storage (storage) we includes equipment into the following groups [2]:

#### **A. Normal use**

- operational (BP-P),
- stored (BP-U),

#### **B. Untouchable stocks (NZ).**

#### **c. Broken down equipment (NEPOTE)**

### 3.4 The operator of the vehicle, the user of the vehicle

The operator of the vehicle is commander (chief director) of the military unit (device) or another senior employee like him.

#### Responsibilities of the operator of the vehicle

- The operator mustn't order or allow using to drive the vehicle if the vehicle, load or driver is not accomplish the statutory requirements and internal normative acts
- The order to move is the regulation to perform a specific task
- A written order to move is normally issued for the task outside the closed object
- Who is the user of the vehicle, what are his duties
- Command to use equipment

The command to use is the basic document for the use of equipment. It is used to check the correct billing and finding economical fuel consumption of issued fuel due to the work. It records work of vehicles and fuel consumption.

The command to use (PPT) is issued on the basis of "Weekly schedule using of equipment" approved by commander of unit for every application equipment, usually for a period of performance of one task.

#### The tasks for students:

- Repeat content of order for use of equipment,
- The vehicle commander's responsibilities.

#### References and further reading:

- [1] Č.j.: 6272-2/2006/DP-3042. Směrnice pro používání pozemní vojenské techniky AČR v míru. Praha: GŠ AČR, 2006.
- [2] Např. zákonem č. 361/2000 Sb. o provozu na pozemních komunikacích ve znění pozdějších předpisů (včetně zákona č. 411/2005 Sb.), zákonem č. 56/2001 Sb. o podmínkách provozu vozidel na pozemních komunikacích
- [3] Všeob-P-37. Pravidla používání vozidel v rezortu Ministerstva obrany. Praha: MO, 2009

## **T 4 - Control of operation on the roads, activities methodology of a military supervisor of traffic**

### **4.1 The commander of military vehicle**

For the accomplishment of tasks associated with the use of a vehicle is determined for each of the military vehicles commander of vehicle. He is determined by the operator or the user of vehicle.

**User** - A user is a person who is assigned to perform the tasks with vehicle according to 'weekly schedule using VTM' (PKP). If it is not intended as a vehicle commander another person, It is user the commander of vehicle.

If a user is assigned more vehicles, he is determine the commanders of individual vehicles.

#### **The commander of military vehicle**

The commander of vehicle has authority over all persons in the vehicle

#### **Obligations of the vehicle commander**

#### **The principles of operation of the vehicle commander**

#### **Safety operation of vehicle**

### **4.2 Signals for guiding of vehicles**

Signals for guiding vehicles (Zákl-2, annex 2)

The commander who guides the vehicle, is always face up to the vehicle at least 5 m away. Never stand between the vehicle and the obstacle and never moves when guiding. If the commander must move he'll stop the vehicle, goes to another place and re-start route guidance. He must always be aware of the all obstacles.

### **4.3 Management of operation**

Traffic on the roads follows the guidelines:

- member of the Police of the Czech Republic,
- military policeman ,
- member of military traffic control service (VPS)

#### **Operational Safety of Vehicles – (Všeb P 37)**

### **4.4 Member of military traffic police and his activities**

Those authorities in managing traffic are using § 75 law 361/2000 Sb. Members of VPS and military police may use while managing use internal normative acts (note: Annex 2, Field manual Zákl-2).

Member of VPS is entitled to:

- **stop vehicles** whose drivers broke traffic discipline and control documents for driving such vehicles,
- **Avoid driving the vehicle to the driver, which grossly violated traffic rules or guidelines for the operation of vehicles**

### **Restrictions on driving vehicles of armed forces**

With the exception of emergency situations applies to vehicles of the armed forces all the legislative provisions for traffic on roads.

For vehicles of the armed forces **does not apply:**

- Entering ban on highway without a valid highway stamps,
- limiting of certain trucks, special vehicles and specific vehicles (§ 43, par. 1 a 2 of law 361/2000 Sb.) in given time of season.
- obligation to pay insurance for damage incurred in the operation of vehicles within the meaning of the č. 168/1999 Sb. for **military vehicles**

Traffic restrictions during various emergency measures

### **Travel speed**

For travel speed of vehicles of armed forces fully apply the relevant provisions of the rules of the road.

### **Parking of vehicles**

Vehicles of armed forces are parked in the park of military equipment.

### **Driving time of drivers**

The driver must at the latest after the maximum driving time, which is 4.5 hours stay the proceedings and to enforce security break of at least 30 minutes (or 2x15 minutes if it adhered to the maximum driving time)

### **Rest time for drivers**

- a) **Rest periods between services at least 12 hours**
- b) **Uninterrupted weekly rest of at least**

### **Transport of persons**

*Transport people in vehicles can only be in places and under conditions specified by producer or an expert implementing regulation for the type and design of the vehicle.*

In vehicles of the armed forces can be transported soldiers in active service, civilian employees and other persons in fulfilling the tasks of the armed forces or tasks in business trips.

### **The rights and obligations of members of the military traffic control service (PVPS)**

(Všeob- P 37 pp.44)

They must: initiate traffic control in advance for not to compromise the safety of traffic;

PVPS can:

entering the intersection while managing traffic after issue of an instruction, "Caution" with rudder or "Stop" with stopping target. In doing so, he must verify that all participants of traffic on the instructions correctly responded;

### **The tasks for students:**

Study and test arm signals for vehicle guidance and self-prepare for the examination of the activity

### **References and further reading:**

- [1] Č.j.: 6272-2/2006/DP-3042. Směrnice pro používání pozemní vojenské techniky AČR v míru. Praha: GŠ AČR, 2006.
- [2] Všeob-P-5. Parky vojenské techniky v působnosti ministerstva obrany a provoz v nich. Praha: MO, 2003
- [3] Všeob-P-37. Pravidla používání vozidel v rezortu Ministerstva obrany. Praha: MO, 2009.
- [4] Zákl-2, (příloha 2) Cvičební řád ozbrojených sil České republiky. Praha: MO, 2005.

## **T 5 - Procedures of traffic accidents solution and other events connected with braking regulations**

### **Introduction**

Each participant of road traffic is required to proceed according to generally accepted legal transcripts when traffic accident arises. Drivers and commanders of military vehicles, have other certain obligations according to provisions of specific regulations.

### **5.1 Cargo transportation**

- Oversize vehicle (cargo)
- Hazardous (dangerous) material
- Conditions of transportation of hazardous material
- Marking of the vehicle (KEMLER CODE - Hazard identification number)
- The driver, documents
  - Safety stops
  - Transport of hazardous material

### **5.2 The columns of vehicles**

- Principles organizations of currents
- Obligations of the commander of current

### **5.3 Traffic accidents**

**What is traffic accident** - incident in road traffic, eg.; crash or collision, which became or started on the road and involving a death or injury to persons or damage to property directly related to the operation of a vehicle in move.

**Obligations of the participants of accident** - Drivers and other participants of the accident are obliged to take measures resulting from the legislation.

**Reporting accident to the authorities** - Unless otherwise stated (eg.) The operator guideline, in order to move etc.), The driver (commander) of the vehicle is obliged to report the creation of accidents to the Police of the Czech Republic in accordance with the law in many cases.

**The driver and other participants in traffic accident** - are required to take the measures provided by law

**The driver (commander) must** inform operator about traffic accident and following the relevant instructions or guidelines operator, which receives

## **5.4 Solution of damage**

After solving the damage caused to state property in connection with a traffic accident vehicle operator provide, without undue delay, MO VÚPZ information about how to solve the of damage together with copies of other documents in a traffic accident (Final Report from Police, a common traffic accident, etc.).

The operator ensure, in traffic accident the vehicle of unit (caused or not caused) or offense of member of the unit in department of traffic, sending the statistical recording of the offense - traffic accident

### **The tasks for students:**

- 1) Define what is it dangerous cargo?
- 2) What is the equipment of the vehicle for the transport of dangerous goods, what kinds of proof carries by driver?
- 3) Think about, how would you continue when happened in an accident by your private vehicle when you fulfil your official journey?

### **References and further reading:**

- [1] Všeob-P-37. Pravidla používání vozidel v rezortu Ministerstva obrany. Praha: MO, 2009.
- [2] Vyhláška MZV č. 64/1986 Sb. ze dne 26.5.1987 o Evropské dohodě o mezinárodní silniční přepravě nebezpečných věcí (ADR)
- [3] Zákon č. 361/2000 Sb., o provozu na pozemních komunikacích a o změnách některých zákonů.

## **T6 Planning and reporting documentation for use, maintenance and repairs**

### **Introduction**

- The present check, fulfillment of estimated tasks;
- Report in TC;
- Notification of topic, the purpose of occupation, learning tasks and literature.

Correct technical condition and reliability of GME are based premises of successful fulfillment of task of Czech army. That's the reason for resulting main tasks of Czech army. Main tasks are technic management of equipment, ensuring the operability, reliability and safety of equipment in accordance with the law of Czech Republic.

This can be achieved by good quality maintenance system and control of equipment.

### **6.1 Documents in relation with operation on logistic company level**

- Schedule of occupation
- Order for using of equipment
- Operating workbook

### **6.2 The maintenance of equipment**

Maintenance of GME is procedure which consist of the periodical control of condition of GME and implementation of preventive interferences. These are procedures focused on maintaining a fault-free state of GME.

Maintenance system of GME in Czech Army is realized by summary of the organizational, technical, environmental and other precautions and measures (inspection, monitoring, cleaning, repair work, pruning, storing, testing, calibration and verification of measuring instruments, etc.). This activities and measures ensure the maintenance or restoration of serviceability of equipment, prescribed technical parameters and preparedness of equipment to use.

### **6.3 Basic kinds of maintenance**

Basic maintenance in peace – maintenance in field

- CHECKING INSPECTION
- MAINTENANCE AFTER USE
- BASIC MAINTENANCE
- TECHNICAL MAINTENANCE TM 1
- TECHNICAL MAINTENANCE TM 2

## **6.4 The maintenance system of the Czech Republic army (ACR).**

System of maintenance is based on system 3xP (PPP - it means Planned nature, Precautionary, Periodicity)

*Planned* – system is based on periodic planning of all levels at units.

*Precautionary* – system is based on set limits of consumption of operating units (the dearest system of maintenance, vehicles have really low level of diagnostic, this consist to high uneconomic , but there is a high reliability of serviceability.

*Periodicity* – at different equipment intervals.

## **6.5 Kinds of maintenance and theirs content and time to perform**

CHECKING INSPECTION (CI) – the purpose of CI is checking of technical state of equipment, detection of preparedness for use of equipment and elimination of defects (eventually supplementing of fuel and ammunition)

MAINTENANCE AFTER USE (MAU) – the purpose of MAU is checking of technical state of equipment, the competence of next using in accordance with principles of safety operation.

BASIC MAINTENANCE (BU) – the purpose of BU is checking and cleaning of GME, check and eventually supplementing of fuel and elimination of defect caused by previous

TECHNICAL MAINTENANCE (TM1, TM 2) – the purpose of TM is comprehensive verification of fiction and technical state of GME (systems, apparatus, devices, groups, subgroups and parts, comparison with the set technical and operational requirements), adjusting of adjustable measurements and wills, changing of parts with shorter working life, eventually supplementing and change of lubricants and fuels, supplementing of missing and worn-out tools, equipment and backup parts, eventually resumption of surface protection.

## **6.6 Records and archiving the data of maintenance.**

Information system of logistic (LIS) are inserted data about:

- BASIC MAINTENANCE;
- TECHNICAL MAINTENANCE TM 1;
- TECHNICAL MAINTENANCE TM 2.

### **The tasks for students:**

Borrow maintenance regulations specified vehicles and list individual operations, evaluate their necessity and effectiveness, and to calculate the total value of spent costs per hour.

## References and further reading:

- [1] Zákl-1. *Základní řád ozbrojených sil České republiky*. Praha: MO, 2001
- [2] MAREŠ, J., EIS, K. *Management údržby pozemní vojenské techniky AČR*, Brno 2008.
- [3] Č.j.: 6272-2/2006/DP-3042. *Směrnice pro používání pozemní vojenské techniky AČR v míru*. Praha: GŠ AČR, 2006.
- [4] Č.j.: 22815/11/2001-1200. *Směrnice pro používání pozemní vojenské techniky AČR v polních podmínkách*. Praha: GŠ AČR, 2001.

## T7 Planning and reporting documentation for use, maintenance and repairs

### Introduction

- The present check, fulfillment of estimated tasks;
- Report in TK;
- Notification of topic, the purpose of occupation, learning tasks and literature.

### 7.1 Basic maintenance – range and persons responsibility

Range of works of different kinds of maintenance is set for every type of equipment by technological procedures. The necessary is compliance with the principles of safety, protection of health and environment. Range of maintenance and time to conduct can't be abridged at the expense of quality.

**According to specific terms and conditions may be specific range of maintenance by Chief of Logistics**

*Checking Inspection (CI) – max. 40 min. Performs driver, crew, service.*

For completeness and quality of works during CI is responsible driver or commander of crew (service).

**Maintenance after use (MAU)**- max. 60 min. Performs driver, crew, service. For organization, range and quality of works is responsible commander who training with equipment conducted, or to whom was equipment assigned.

**Basic maintenance (BM)** – in range of 1 day. Performs driver, crew, service what is conducted by commander of unit. For commissioning works is planned required number of specialists from repair unit.

**Technical maintenance (TM 1, TM 2)** – in range set in maintenance prescription. TM is conducted in two levels: TM 1, TM 2. Range, frequency and technologies of conducting are set by prescription for every type of equipment. Lubricants and operating fluids are changed according their standard lifetime.

For timely request of TM is responsible commander of unit. TM is conducted by specialists of repair units for the presence of crew (service), driver.

### 7.2 Fundamental maintenance conducted in field

The main kind of maintenance in field conditions is maintenance after use.

System of maintenance GME in field includes:

- Checking inspection (before use and during pauses),
- maintenance after use,
- technical maintenance (TM 1, TM 2),
- special kinds of maintenance,
- preparing of equipment for use in summer or in winter (seasonal maintenance) .

### **7.3 Documentation management after realized maintenance**

#### **The main document for consequently evidence in Information system of Logistics is Command for use of equipment (CUE)**

Archiving of CUE lasts 5 years. CUE is basic document for using armament and equipment. It serves for control of correct account and detection of economy of issued fuel due to the work done of GME. There is recorded work of vehicle and consumption of fuel (POL).

Maintenance notice - "Order for use is issued specifically for this purpose

- Basic maintenance
- TM 1
- TM 2

### **7.4 Maintenance in field**

Maintenance of GME in field conceptions ensuring reliability of GME and safe using. It reduces possible elimination from traffic because of technical reasons. The organization has to provide quick and hidden conduct of all works during the preservation of combat promptitude.

#### *The main principles*

- First restore the operability of combat GME for units on a definitive direction;
- Maintenance do with regard to the tactical situation, condition of terrain, climatic conditions and the anticipated performance of tasks
- Maintenance realized directly in combat configurations
- To conducting exploit pauses in combat activity, stops in transport, stops before combat, after fulfillment of task and time of deployment out of combat.
- Maintenance do by crews, services and drivers with using the workshops specialists and theirs mobile resources,
- According the needs is first conducted partial or complete decontamination.

### **7.5 Obligations of commanders during maintenance**

Maintenance is conducted by drivers, crews (services) under the direct control of commanders and theirs technical (special) functionaries or functionaries of unit of technical securing with using specialists for maintenance and repairs. Maintenance is entire part of command preparation!

Maintenance is planned in schedule of occupation in the frame of time of occupation

#### **Duties of commander of unit**

- I. STAGE (planning)
- II. STAGE (performing)
- III. STAGE (evaluation)

Command for performing of maintenance is emitted generally orally. It is necessary to appoint:

- ⇒ complete organization (time, spaces and consult of vehicles),
- ⇒ works conducted before maintenance (cleaning and supplementing of PHM),
- ⇒ clarification of range and technology of works,

- ⇒ methods and resources of control,
- ⇒ the way of elimination of defects,
- ⇒ safety measures,
- ⇒ ensuring of cleanup of assigned spaces.

### **The tasks for students:**

- ✓ To study the contents of Order for use of equipment and carry out its completion
- ✓ In part "Special records" to note at least 5 reasons to be recorded here

### **References and further reading:**

#### **Literature**

- [1] Zákl-1. *Základní řád ozbrojených sil České republiky*. Praha: MO, 2001
- [2] MAREŠ, J., EIS, K. *Management údržby pozemní vojenské techniky AČR*, Brno 2008.
- [3] Č.j.: 6272-2/2006/DP-3042. *Směrnice pro používání pozemní vojenské techniky AČR v míru*. Praha: GŠ AČR, 2006.
- [4] Č.j.: 22815/11/2001-1200. *Směrnice pro používání pozemní vojenské techniky AČR v polních podmínkách*. Praha: GŠ AČR, 2001.

## T8 Planning and reporting documentation for use, maintenance and repairs

### Introduction

- The present check, fulfillment of estimated tasks;
  - Report in TK;
  - Notification of topic, the purpose of occupation, learning tasks and literature.
- 
- In vehicles of Army of Czech Republic are as secondary sources of electrical energy the lead accumulators. These accumulators have special construction. There are main principles of their care and maintenance.
  - Some of newly implemented equipment (for example T-72M4CZ) use „maintenance free accumulators – or without maintenance accumulators (so call gels accumulators), their maintenance is managed by producer directions).

### 8.1 Maintenance of accumulators

#### Main principles of maintenance:

- ⇒ After implementation to operation, maintain the accumulator in a charged conditions (state) as prevention against the **sulfatation**,
- ⇒ surface of accumulators keep in clean for elimination **self-discharge** effect,
- ⇒ regular check of electrolyte and supplementing by **distillated water**
- ⇒ tightening and check of the output terminals of the accumulator.

#### Control check-up

With the engine running supervise the activities of the power system of accumulators by the device fitted to the vehicle

**Maintenance after use** – visual check of state of encapsulates cell, caps battery, accumulator's members, and cleaning the surface of accumulator.

**Basic maintenance** – level height check and density of the electrolyte check and supplementing by distillated water

**Technical maintenance** – in the recharging station, accumulators check regular deadlines.

#### Responsibility

For organization and maintenance of accumulators performance in the frame of control check-up maintenance after use and basic maintenance are responsible commanders. They are responsible for timely dispatch of the accumulators to the technical maintenance on the charging station, too.

For quality and range of technical maintenance of accumulators on the charging station is chief of charging station.

### ***Special maintenance throughout the winter***

From the physic-chemical reasons occur at lead-acid batteries decreasing temperature to drop their capacity (decrease starting abilities) and the possibility of freezing the electrolyte depending on its density. It is therefore necessary for the operation and maintenance of batteries to have specific rules.

## **8.2 Others activities during the maintenance in field**

Maintenance PVT in field conditions provides a trouble-free and safe to use and reduces the possible decommissioning due to technical reasons.

*The maintenance of GME in the field*

☐ *Basic inspections*

☐ *MAINTENANCE after USE*

☐ ~~*BASIC MAINTENANCE*~~

☐ *TECHNICAL MAINTENANCE*

The main principles of maintenance in the field

Range of work

## **8.3 Organization and management of maintenance**

Performing maintenance in the field is limited, among other things temporal possibilities and conditions of the task while trying to restore as soon as possible uptime PVT. The order of the work must be chosen so that even with forced induction (ending in lack of time) allowed the task.

Ranking work in Basic inspection and maintenance after use

### **The order of operations during TÚ PVT field**

1. decontamination if it was used in GME conditions of use WMD,
2. pyrotechnic security
3. mask, customized technology work carried out,

4. control and maintenance of weapons, means of communication, navigation and vision system equipment,
5. supplement ammunition, fuel, lubricants and operating materials
6. Check and adjust the actuator systems, groups and subgroups,
7. Provision of vision and observation of GME (vehicles)
8. Inspection and maintenance of backup sets of parts, tools and accessories, supplement supplies
9. If possible to clean and wash of GME

## **8.4 Organizational support of maintenance**

### Responsibility of commanders and officials logistics for maintenance

For maintenance, the allocation of the necessary time and area is responsible commander (chief director) of unit

#### **Squad commander (team leader)**

Squad (crew, operator) is responsible among other things for the condition and completeness of equipment, other equipment and other material at subordinates and their proper use, maintenance and storage. He is obliged to check **daily** maintenance and storage equipment, other equipment and other material after training.

**At least 1 x per week** is required to check the status of equipment, other equipment and other material cooperatives, completeness and readiness.

#### **Deputy of platoon leader**

Deputy platoon commander is responsible among other things for the condition and completeness of equipment, other equipment and other material crews and their proper use, maintenance and storage.

#### **Platoon leader (commander)**

Platoon is responsible among other things for the condition and completeness of equipment, other equipment and other material crews and their proper use, maintenance and storage.

#### **Technician of company**

Technician of company (ies) is responsible inter alia for the proper technical condition of equipment and other techniques technically correct use, operation, timely maintenance, storage and repair techniques, health and safety, fire protection and environmental protection in their expertise.

#### **Company commander**

The company commander (battery) is responsible among other things for the state, recording and completeness of equipment, other equipment and other material company (ies), health and safety of members of the company and the environment.

**At least 1 x per week** is required to check the status of allocated spaces and park facilities.

**At least 1 x 2 months** to check the status of equipment and other technology company (ies), the completeness and readiness.

## **8.5 Order for maintenance performance**

The master or other officer in charge of managing the maintenance issue instructions to subordinates in the form of "order for maintenance"

### Content of Order for maintenance

- overall maintenance organization (the type of maintenance, time, facilities, vehicles, etc. )
- work performed prior to maintenance (for instants : Washing and refueling )
- specify range and technology work,
- methods and means of control,
- method of removing defects,
- safety precautions,
- to secure cleaning allocated space.

"The order to perform maintenance" is not strictly specified content. At level unit "order for maintenance" generally not issued in writing, but **only orally**.

### **The tasks for students:**

- ✓ To prepare in written form procedure of maintenance for accumulators.

### **References and further reading:**

#### **Literature**

- [1] Zákl-1. *Základní řád ozbrojených sil České republiky*. Praha: MO, 2001
- [2] MAREŠ, J., EIS, K. *Management údržby pozemní vojenské techniky AČR*, Brno 2008.

## T9 Planning and reporting documentation for use, maintenance and repairs

### Introduction

- check for presence, completing the mission;
- sign to the class register;
- announcement of topic, aims of presentation, learning tasks and literature.

Due to specific tasks and organization of the operation are not obliged to deliver the vehicle operator to regular technical inspection and emission measurements on all vehicles of the armed forces.

Security measures based on Law no. 221/99 Coll. of Soldiers, Law no. 262/2006 Sb. the so-called "Labor Code" military rule Vševojsk-16-7 (protection of soil and water from the adverse effects of harmful substances) and regulations for the maintenance of each type.

### 9.1 Implementation of vehicle inspections Armed Forces STK and SME

Vehicles subject to inspection at STK and cream

The ACR conditions are subject to the implementation of technical inspections and emission measurements

- **Road vehicles** of all types and categories (motorcycles, cars, buses, trucks, special vehicles, trailers etc.). if they are included in the group of "BP-operation"
- **Special vehicles** types of tractors, self-propelled machine working and working machine mount, if they are included in the group of "BP-operation"
- **Military vehicles**, if they are used to perform official duties or transport on public highways.

#### Manner of checks

Roadworthiness armed forces as possible departments conducted in established military STK and SME network or civilian stations.

In the civilian sector, technical inspection and emission always applied to vehicles whose technical competence approved by Ministry of transportation - MDS CR (road vehicles).

## **Deadlines for implementation**

Armored vehicles devices attached to a technical inspection or. emission measurements at intervals arising from § 40 of Act no. 56/2001 Coll. [7

Trucks with a maximum weight exceeding 3 500 kg, special vehicles, buses, road vehicles with the right of way,

**... not later than 1 year after the registration of the vehicle and then regularly at the latest one-year periods,**

## **9.2 Implementation of vehicle inspections Armed Forces STC and SME**

There is prohibited to operate equipment of which are not properly and timely established revisions according to the law and calibration. Identified technical devices are specified technical equipment (ITD):

- pressure equipment,
- gas,
- electric
- lifting,
- protective and others which are designed and manufactured for use with military equipment.

### **Revision places**

Tests ITD (revision) is performed at designated inspection locations that correspond to its equipment relevant legal norms, their staff are regularly trained

### **Air tanks of vehicles**

Air tanks are the most widespread pressure device for vehicles. As part of the pressurized-air brake systems are classified as "stable pressure vessels" as long as their highest operating pressure exceeds 0.05 MPa.

### **Pressure bottles**

**Pressure bottles** of air systems of vehicles (eg. In combat vehicles) belongs to the category of "metal pressure vessels". They are subject to revision like reservoirs.

**Lifting equipment** - include:

- lift
- hydraulic arm
- lifting ramps, platforms
- winches,
- means for fastening, hanging

## **Deadlines for implementation**

For both groups of lifting equipment to sift functions, operational capacity and implement safety inspection and tests:

- before implementation to the operation,
- reconstructed or after general repairs,
- after repair,
- in operation,

### **9.3 Safety, anti-fire and ecological precautions during maintenance GME**

#### **Safety precautions**

1. The maintenance of GME is possible to provide in areas designated and adapted, designated and trained persons.
2. Work manages designated head of department.
3. All staff are required to take safety precautions, technology assessment work, organization, discipline and order.
4. Before starting work, you must always ensure that the vehicle against rolling chock (or Articles bands) and prepare equipment (steps, tools, drip tubs, fire extinguishers, etc.).
- 5th door caps and lids must be closed or safely secured in the open position. At the technical maintenance must be removed from the vehicle ammunition.
6. In carrying out the work all workers are obliged to observe technological discipline and perform only mandated tasks.
7. To work use exclusively equipment, tools and accessories in proper condition and purpose. Special equipment and aids (lifting and handling equipment, electrical equipment, etc.) May operate only person the designated and trained.
8. When the movement of vehicles on the need to take extra care.

#### **Anti-fire precautions**

Before starting work, workers are obliged to satisfy themselves and deployment readiness of fire extinguishers, respectively. other technical means for extinguishing a fire in the area intended for the work. In the absence of (eg. In the field) or malfunction of these devices, remove and ready to use fire extinguishers from vehicles.

Ignition and flame adjustment and especially self-operating lamps performed in a dedicated area where to place fire extinguisher equipment of the vehicle. For a vehicle to manipulate these resources only when directed by the head of department.

#### **Ecological precautions**

When handling batteries caution against stain it or electrolyte leakage.

Washing (cleaning) vehicles possible to perform at the area and facilities for this purpose, a security leak oil or other environmentally hazardous substances.

### **The tasks for students:**

⇒ To create list of anti-fire and ecological precautions and their prevention

### **References and further reading:**

- [1] Č.j.: 6272-2/2006/DP-3042. *Směrnice pro používání pozemní vojenské techniky AČR v míru*. Praha: GŠ AČR, 2006.
- [2] Vyhláška Ministerstva obrany č. 273/1999 Sb., *kteřou se vymezují určená technická zařízení používaná vojenskou výstrojí, vojenskou výzbrojí, vojenskou technikou a ve vojenských objektech a provádění zkoušek určených technických zařízení*.
- [3] MAREŠ, J. EIS, K. *Management údržby pozemní vojenské techniky*. Brno 2008.
- [4] Tank-30-3. *Zákonné revizní prohlídky jeřábů na tankových a automobilových podvozcích*. Praha: MNO, 1971.

## **T10 The overall precautions for ensuring the operability of equipment (basic and special maintenance)**

### **Introduction**

- check for presence, completing the mission;
- sign to the class register;
- announcement of topic, aims of presentation, learning tasks and literature.

When using equipment deviation from their proper technical condition. The most frequent causes of these changes are physical aging and wear of material deficiencies in maintenance, accident damage and martial techniques, or others.

### **10.1 Repairs of the ground military equipment in ACR**

#### **Definition of repairs**

Repair is an activity whose aim is to restore the technical characteristics of worn or damaged material to a predetermined or pre-agreed level.

Corrections are part of the technical measures for the system operation PVT ACR.

The most common causes of changes:

- physical aging and wear of the material,
- deficiencies in maintenance,
- accidents techniques,
- combat damage

### **10.2 The kinds of repairs**

Depending on the nature of faults and defects, labor and technical demands for their removal, repairs are divided into:

- routine repairs
- overhaul – general repairs
- overhaul of assemblies, sub-units or of part (hereinafter referred to as the overall repair groups)

- revision of extended storage PVT after 10 years (RE-10)

### **Routine repairs**

**Finding repair** - is usually planned repair, which is done after completing between- repairs standards. Range finding repair is determined individually based on the results of the control or service.

**Medium repair** - is scheduled repairs, whose execution is usually provided by the manufacturer.

**Overhaul** - is a correction, which is in the range limit deviations restore the original technical characteristics GME.

Lies in the complete disassembly, replacement of defective parts and components for new or repaired and re-assembly including the restoration finishes.

**Complete overhaul** – It is correction, which is in the range limit deviations restore the original technical characteristics of groups or subgroups of part units diverted from GME

### **RE-10-**

Revision after 10 years is a special type of repairs being carried out within the stipulated time standards for long-term storage GME.

The aim is to restore operability groups, subgroups, and part of part units, replace operating materials

### **10.3 Levels of the repairs**

In view of the complexity of the repair troop divided into three levels:

I. Level = repairs, which provides service and Specialists own department,

II. Level = repairs that secures Logistics Battalion (142nd Brigade Logistics Battalion corrections)

III. Level = repairs, which provide a central repair base and base storage.

IV. level (out of forces) = repairs, assured networks

Civilian repair business (eg. VOP 025 Novy Jicin, past and VOP 026 Šternberk.

## 10.4 Management of repairs

Repairs are carried out by refinement of operational planning documents based on the actual state of GME.

**Planning for repairs** - basic document for repair planning is a prospective plan GO (5 years).

**Documentation** - The basic documentation for requesting and managing repairs on stage unit includes a series of documents - the basic message – requisition.

### The tasks for students:

- ✓ Prepare forms for requesting of repairs.

### References and further reading:

- [1] MAREŠ, J. EIS, K. Management údržby pozemní vojenské techniky. Brno 2008.
- [2] Log-2-4. Vojskové opravy pozemní vojenské techniky. Praha: MO, 2002.
- [3] EIS, K. Technická příprava pro aplikační kurzy studentů Univerzity obrany. (přt. S 265). Vyškov: VA, 2006.
- [4] Tank-26-29/s. Vojskové opravy VPV.

## **T11 Summary of precaution for ensuring the operability equipment (basic and special maintenance) measures**

### **Introduction**

- check for presence, completing the mission;
- sign to the class register;
- announcement of topic, aims of presentation, learning tasks and literature.

Elementary document for planning repairs is perspective plan GO (for 5 years). During planning and realization repairs take in to account between repairs norms and consumption of operational units, norms for long-range keep GME, probations for doing revisions and calibrations UTZ, real situation a age of GME

### **11.1 Documentation for planning of repairs**

The basic documentation for requesting and managing repairs on the degree of formation include:

- annual/perspective plan of maintenance,
- report-announcement,
- list of requirements,
- report about technical condition,
- report about handover and takeover vehicle to repair,
- documentation of tenders,
- workshop documentation.

For squad of repair of logistics company leads the following planning and reporting documentation about realized repairs:

- report-announcement, it is document about performed work,
- book of maintenance and repairs with registered numbers of orders,
- schedule (daily) of working,
- summary timesheet,
- productive plan and plan of repair activity per month,
- release note of material,
- protocol about range of repair.

### **11.2 Methods of work**

Process of works at repairing determine technological processes, which they are designated by regulations for the most used type of techniques.

The basic technological sequence of repairs contain works in this order:

- technical inspection condition of GME,
- removal GME (group) according to the extent of repairs,
- cleaning of groups (components),
- specification of range damage (finding, request of material),

- adjustment dismantled groups (subgroups),
- installation of new or repaired groups (subgroups, parts),
- adjustment and testing of the mounting unit,
- test drive and functional testing weapons by shooting,
- elimination of the defects found,
- renewal of surface protection as needed,
- output check

### **11.3 Take over a hand over equipment for repair**

*GME is passed on to repair according of decision by the authority of logistics based on " Report-announcement " or approved " List of requirements " .*

*The own way of transmission of GME to repair and its assumption is set in operating rules of corrector.*

#### **Main regulations**

GME is usually sent to send to repair with crew (service, driver), which is present at equipment for all the time of repair.

For the transport of vehicles and timely handover for conducting repair is responsible operator of vehicle. Vehicles, eventually theirs groups and component sub-units which are passed to repair have to be protected against to corrosion.

#### **Documentation take over with equipment**

GME is passed to repair conducted by resources of military unit (platoon of repairs). Together with equipment there must bet his documents:

- „report-announcement“,
- „Command for the use of equipment“,
- complete operation documentation (operating workbook)

**Outside the own military unit** is GME passed together with this documentation:

- „ sheet of requirements“ or „report-announcement“,
- „Report of technical state“,
- „Report of handover and takeover of equipment“,
- „Command for the use of equipment“,
- complete operation documentation (operating workbook)

#### **Takeover of equipment from repair**

Operator (the commander of military unit) is required to send commander of unit or functionary to takeover of repairs GME in set term. It's happens to a notice of corrector.

The functionary who is taking the equipment has to have written authorization. The takeover of GME is authorized by one of these documents:

- written authorization to take of repairs equipment (power of attorney);
- book loans and repairs;
- rebooking proof - receipt.

## 11.4 Field repairs

Field repairs are part of the system of recovery of serviceability of GME. This system consists of these activities:

- ⇒ technical reconnaissance,
- ⇒ recovery and removals of damaged GME
- ⇒ field repairs,
- ⇒ handover of GME to repair in field and back to unit,
- ⇒ material supply.

**Definition** – Field repairs are consisted of all The operations which are conducted outside the permanent workshops. By these operations are eliminated consequences of operational wear, mechanical damage, accident, workmanship and especially combat damage of GME. The purpose is to restore their proper functions.

In terms of usability of GME in field conditions divide the damaged equipment to:

- repairable GME;
- irretrievable loss of GME.

### Repair level on the field:

In field conditions are distinguished by the extent of damage and repair work following levels of correction:

I. Level (BO) = basic type of repairs carried out by mobile workshop resources department,

- laboriousness max. 50 ÷ 60 norm - hours (Nh)

II. Level (BO) = repairs carried out by mobile devices of Brigade (created company repairs);

- laboriousness max. **100** Nh,

III. Level (SO) = repairs by the use of resources of Logistics Command,

- laboriousness max.400 Nh,

IV. Level (GO) = repair, that by their extent and technology intensity exceeds III. Level

- Is carried out in a network of civilian enterprises

### The tasks for students:

- ✓ To count of capacity of repair unit

### References and further reading:

[1] MAREŠ, J. EIS, K. Management údržby pozemní vojenské techniky. Brno 2008.

- [2] Log-2-4. Vojskové opravy pozemní vojenské techniky. Praha: MO, 2002.
- [3] EIS, K. Technická příprava pro aplikační kurzy studentů Univerzity obrany. (přt. S 265). Vyškov: VA, 2006.

## **T12 Summary of precaution for ensuring the operability equipment (basic and special maintenance) measures**

### **Introduction**

- check for presence, completing the mission;
- sign to the class register;
- announcement of topic, aims of presentation, learning tasks and literature.

Executing the special kinds of maintenance is related to the equipment for which is its execution determined by military regulations, original documents of producer or followed from the strangeness of its execution.

### **12.1 Special kinds of maintenance**

Special kinds of maintenance are:

- preparing the equipment for the seasonal operation (summer-winter season)
- maintenance after the water obstacles over coming
- maintenance after using in the very heavy conditions
- supplementary technical maintenance
- maintenance during the stocking
- maintenance after using the weapons

### **12.2 Preparation of the equipment for the use for summer and winter season**

Preparation for use for summer and for winter season is pursued with the equipment, for which is its execution determined by military regulations or in accompanying documents of producer. For other equipment is extent of preparation and the way of its pursuing determined by the chief of the logistic in the army unit.

**Goal** – the goal is to prepare the persons, the equipment and the ground facility for the operation in changing weather conditions.

**The most important factors** which influence the operation of the equipment in **winter season** are:

- ⇒ low temperature of ambient air, which make worst the starting up of engines and causes the freezing of the water in some systems of the equipment
- ⇒ increased air humidity enable the higher condensation of the water and following corrosion of the metal parts
- ⇒ worsened adhesive conditions together with lowered visibility lowered the safety of the operation of the vehicles

In **summer season** these factors influence the operation of the equipment:

- ⇒ higher air temperature, which result in higher danger of overheat of the engines, possibility of formation of the fire and more intensive evaporation of the water
- ⇒ increased dustiness which make worst the visibility, cause the higher **wearing out and blowing** of the moving parts
- ⇒ more intensive precipitation make more difficult passableness of the equipment in little load bearing terrain and increase the possibility of entry of the water to the engines and destruction of operational fills.

### **12.3 Plan processing of the execution for the seasonal operation**

Extent of works:

Preparation of the equipment for use in summer and winter season is divided into three parts according to its content:

- preparation of persons
- preparation of the equipment
- preparation of the technological facility of workshops and ground military equipment

#### **Person preparation**

The person preparation is focused on explanation of extent and right work technology pursuing during the preparation of the equipment, strangeness of its using and maintenance in oncoming season, mastering the principles of the safety operation, technology of letting down the engines, using the tools to make easier the letting down of engines during the lowest temperatures to the control authority, drivers, users and other participating persons.

#### **Equipment preparation**

Extent of works on equipment is determined by expert regulations for maintenance of concrete type of the equipment. Superior headquarters can determine the works out of prescribed extent.

Own works can be realized by **knotted, line** or combined way.

#### **Preparation of the facility of workshops and grounds**

Preparation of the technological facility of workshops and ground military equipment is determined according to similar principles as the equipment preparation, including the processing of individual plan for preparation of the individual facilities.

### **Limits of execution:**

Concrete dates for execution preparation of the equipment are determined by the chief of the unit so that sets technological operations on equipment are finished:

- up to **30.4.** in case of preparation for using in summer season,
- up to **31.10.** in case of preparation for using in winter season.

In time of PTZP/LP is forbidden to plan other employment on unit. Also it is forbidden post away the drivers, crew in this time.

It is necessary to prepare processing plan of execution for this period, by which all persons are instructed with. There is commanders order” and for preparatory, executive and evaluation periods in scope of preparation equipment for the season operation.

### **The tasks for students:**

- To prepare the execution plan for preparation of the equipment for the seasonal operation.

### **References and further reading:**

- [1] MAREŠ, J. EIS, K. Management údržby pozemní vojenské techniky. Brno 2008.
- [2] Č.j.: 6272-2/2006/DP-3042. *Směrnice pro používání pozemní vojenské techniky AČR v míru*. Praha: GŠ AČR, 2006.
- [3] EIS, K. Technická příprava pro aplikační kurzy studentů Univerzity obrany. (přt. S 265). Vyškov: VA, 2006.

## **T13 Summary of precaution for ensuring the operability equipment (basic and special maintenance) measures**

### **Introduction**

- check for presence, completing the mission;
- sign to the class register;
- announcement of topic, aims of presentation, learning tasks and literature.

Special types of maintenance are carried out as in peace, so in the field and belongs to the flagship for the conservation of fighting abilities equipment

### **13.1 Other specific methods of maintenance**

The implementation of the specific types of maintenance relates to the technique for which is their implementation of the established military regulations, the accompanying documentation of the manufacturer or the result of the peculiarities of its use.

The specific methods of maintenance are:

- preparation techniques for use in summer and winter
- maintenance after overcoming water obstacles
- maintenance after use in particularly difficult conditions
- additional technical maintenance
- during storage
- maintenance, after the use of weapons

### **13.2 Maintenance after water obstacles overcoming**

The aim is to restore fighting abilities equipment, the deletion of the residues of water, drying of the vehicle, lubricating and check, or change of the lubricant filling the chassis and the parts that were in direct contact with the water.

Done is the drivers and the crew in the range specified by the regulations for the individual types of techniques, or according to field manuals:

Tank-6-3 after driving tanks under water,

Tank-6-4 after the cruise OT, and BMP, PTS 10.

#### Place of implementation:

As a rule, in the field of parks techniques. Can be carried out in the performance of combat operations at the following banks in secret or produced by the masking.

### **13.3 Maintenance after use in particularly difficult conditions**

The aim is to eliminate the negative effects of the use of vehicles in the demanding and specific conditions.

The range is set in the rules for the maintenance of different kinds of PVT. As a rule, contains the acts of maintenance after use, complemented by a thorough inspection of the extremely loaded parts according to the type and method of use.

### **13.4 Additional technical maintenance**

The aim is to lubricate at the lubricating points of the vehicle, replacement of oils, lubricants and other operating materials and maintenance of the occupational groups in terms of outside technical maintenance.

Organizes and directs it technical leader of the unit, to the extent provided in the professional regulation or according to the instructions of the manufacturer or supplier.

By the professional workplace or driver operator

### **13.5 Maintenance after use of weapons**

The aim is to carry out maintenance on weapons and weapon system after the shooting or training associated with the use of arms and combat vehicles.

Organize and manage it to the commanders of the units, to the extent provided by the manufacturer of the weapons

### **13.6 Maintenance during storage**

The frequency and method of implementation of the maintenance and controls vary according to the type of deposit and the method of protection of the individual types of techniques

#### **The tasks for students:**

- Provide a plan for the implementation of seasonal maintenance in the range of 10 pages at all the stages (Consists of preparation, implementation and evaluation period).

#### **References and further reading:**

- [1] MAREŠ, J. EIS, K. Management údržby pozemní vojenské techniky. Brno 2008.
- [2] Č.j.: 6272-2/2006/DP-3042. *Směrnice pro používání pozemní vojenské techniky AČR v míru*. Praha: GŠ AČR, 2006.
- [3] Tank-6-3 Příprava vozidla pro jízdu tanků pod vodou,

[4] Tank-6-4 Příprava vozidla pro plavbu OT a BVP.

## T14 Management of perform of individual kinds of maintenance, including storage and preparation GME on seasonal operation

### Introduction

- check for presence, completing the mission;
- sign to the class register;
- announcement of topic, aims of presentation, learning tasks and literature.

The goal of the storage is to limit the influence of physical aging on the GME. For this are used the means temporary protection of individual parts or barrier protection of equipment as a whole.

### 14.1 Storage of military equipment

Storage is a set of technical and organizational measures that limit the influence of physical aging and weather conditions on equipment.

According to the conditions and length of storage distinguish:

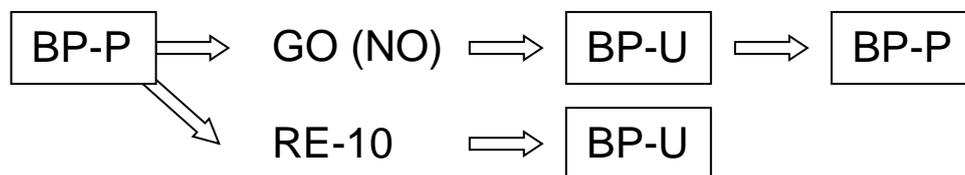
- short-term storage under 1 year,
- long-term storage over 1 year, usually for a period of 5 years.

### 14.2 Principles for the classification GME into groups

**Equipment NU-S** - Equipment included in the group of normal use – stored, can be used up to 2 times per training year to the tasks specified in the relevant plan for the training year.

**Equipment US** - Equipment of untouchables supplies are used to cover the needs of the ACR in an emergency state, protection of the population, or in other emergency situations. In normal peaceful life is long-term storage at logistics bases.

Removing equipment US from store and its use allows except in special cases (fire, flood, etc.) only Chief of the General Staff of ACR.



### 14.3 Types of storage

Short-term storage

Long-term storage

According to the method of storage there are distinguished:

- storage with forces and resources from our unit,
- storage using contractors,
- combination of both.

### **Short-term storage**

Short-term storage is the main type of conservation and storage equipment in common use at the unit.

In the short term are stored GME, which is not planned for use for a period longer than 1 month. For storing supernumerary equipment can alleviate the conditions of storage under Regulation chief logistics boss stage. Always, however, must be done conservation arms, motor and the injection pump.

The equipment in the short-term are stored no later than 14 days of the end of use after careful adjustment, completion and inspection. Equipment are stored usually by crew, only for some acts are created groups of specialists.

If is planned additional storage after a period of storage, must be perform new conservation equipment that can be performed repeatedly, for a maximum period of 3 years.

### **Long-term storage**

The long-term storage is the main type of conservation and storage equipment US.

In the long-term are stored new equipment, after performed a general or finding repair, or after performed RE-10.

For long-term storage are used combination of means temporary protection with subsequent packaging into whole pack, its total seal and finish interior crypto climate.

## **14.4 The organization works during storing**

The scope of works at the storage, the quality of their execution and properties of use preservative, must ensure the correct technical state for the duration of its deposit.

Storage of equipment by military way is performed according to technological processes for storage, prepared for each type equipment.

At storage equipment non-military suppliers may be technological progress part in the contract documents.

## **14.5 Documents stored Equipment**

Storing equipment is written in "Operation Workbook" (section "6. Record of conservation and storage equipment"), which is stored by the unit's commander.

At the stage unit for the purpose of storage GME also keeps:

- "Answering stored equipment", which is based in operational documentation,
- "Warehouse ticket", which is deposited material marked,
- "The monthly maintenance plan and controls stored equipment".

### **The tasks for students:**

- ❖ Study different items which are written in recorded book of stored equipment.

### **References and further reading:**

- [1] MAREŠ, J. EIS, K. Management údržby pozemní vojenské techniky. Brno 2008.
- [2] Č.j.: 6272-2/2006/DP-3042. *Směrnice pro používání pozemní vojenské techniky AČR v míru*. Praha: GŠ AČR, 2006.
- [3] Č.j.:6272-1/2005/DP-3042. *Směrnice ukládání vojenského materiálu*. Praha: Sekce podpory MO, 2005.

## **T15 Management of perform of individual kinds of maintenance, including storage and preparation GME on seasonal operation**

### **Introduction**

- check for presence, completing the mission;
- sign to the class register;
- announcement of topic, aims of presentation, learning tasks and literature.

### **15.1 Corrosion of the material**

Definition- Corrosion of metals is chemical or chemical-physical process of the interaction metal-environment.

Scheme of construction of the rust.

Rust is according to the climatic conditions heterogeneous agglomerate.

### **15.2 Definition of the term and concept of corrosion**

Corrosion - irreversible degradation of the material

Corrosion of non-metallic material is basically the process of aging

#### The concept of corrosion

Aspects: - theoretical - corrosion process = theoretical consideration the possibility of beginning the corrosion

- From a practical point of view - the phenomenal form – result of process

causes of corrosion - chemical formula expression

### **15.3 Corrosion - characteristic of depreciation classification of the corrosion**

Division of corrosion along to species:

- chemical corrosion
- electrochemical corrosion
- corrosion in gases- atmosphere- in exhaust
- Corrosion in fluids

Products of the corrosion-

- Peroxides and oxides
- Acids
- Sulphur and sulphur compounds

#### **15.4 Corrosion and kinds of attack**

- planar corrosion
- point corrosion
- intercrystalline corrosion
- interior crystalline corrosion

#### **15.5 Effect of environment on corrosion**

- Especially the condensation of airy moisture on the surface of products due to rainfall, snow, dew, fog.

#### **15.6 Principles of protection against corrosion**

Methods for protection against corrosion

I. Arrangement of corrosion system based on - reducing the thermodynamic instability- influence the course of corrosion reactions.

II. Measures affecting the rate of corrosion reactions - using materials with a slower course - editing environment

Corrosion inhibitors - Substances protecting metal against corrosion:

- ingredients to process oils
- solutions in the water
- powders, tablets, aerosols
- anti-corrosion packaging materials

## 15.7 Preservative materials

Preservative materials must be used in accordance with the regulations. In particular it concerns the protection of water, ground ahead of adverse effects of harmful substances

Selected means of temporary protection:

- preservative oils
- preservative fats
- preservative waxes
- operating preservatives means

## 15.8 Possibilities of reduction and elimination of losses

Commonly is calculated that using protection and means against corrosion saves 20-40% of the cost, but it requires:

- optimal anticorrosion protection
- engage in time into project preparation
- develop manufacturing anticorrosion protection
- raise knowing about the properties of materials and supply options
- improve the quality of output control of anticorrosion protection
- apply more suitable methods of anticorrosion protection

### The tasks for students:

#### The tasks for individual work:

- ❖ Repeat principles of protection against corrosion, ways how to solve it.

### References and further reading:

[1] Tank 30-1 Skladování taktového a automobilního materiálu. Praha 1991.

[2] Č.j.:6272-1/2005/DP-3042. *Směrnice ukládání vojenského materiálu*. Praha: Sekce podpory MO, 2005.

## **T16 Management of perform of individual kinds of maintenance, including storage and preparation GME on seasonal operation**

### **Introduction**

- check for presence, completing the mission;
- sign to the class register;
- announcement of topic, aims of presentation, learning tasks and literature.

### **16.1 The basic provision**

Methods and means of protection equipment techniques and materials from deterioration. Protection are addressed systemically.

The system of protection against depreciation:

It is a set of technical measures designed to reduce or eliminate the degrading effect of the external environment.

The system includes measures:

- a) the selection of resistant structural materials
- b) the design and technological solutions
- c) application of protective coatings of all kinds
- d) use of the means of temporary protection
- e) adjusting the technological environment
- f) combination of the previous methods

### **16.2 Overview of storage methods**

Short-term storage

Long-term storage

Appropriate methods for implementing the imposition of VTM is considered to be that fully preserve the technical life of VTM, the methods include:

- ✓ Conservation VTM using preservatives
- ✓ Application Evaporating corrosion inhibitors
- ✓ Protective packaging using packaging materials
- ✓ By means of regulating the storage environment
- ✓ Use means of preventing access devaluation – hermetically tight
- ✓ Combination of possible methods

### **16.3 The material storage inside vehicles**

The technique may be nothing that did not correspond to the time saving techniques - materials must be removed, but again secure their re-insertion after removal from storage.

Saving is published in the master, which states:

- ⇒ Number
- ⇒ Number of product,
- ⇒ VPZ
- ⇒ Kind of storage

- ⇒ Deadline preparing to store
- ⇒ Material security
- ⇒ Responsible person
- ⇒ Procedure for acceptance of the material
- ⇒ End preparation to store
- ⇒ Commission to be implemented

#### **16.4 The storage of spare parts**

Saving ND is also divided into:

- Short-term storage
- Long-term storage

#### **16.5 Technological procedures of storage**

- ❖ acclimatization material
- ❖ checks
- ❖ surface preparation
- ❖ preservation material
- ❖ storage container
- ❖ marking an object made for preservation
- ❖ outer protective packaging
- ❖ acclimatization protected products.

#### **16.6 Directions for health protection during storage**

All those who are involved in the storage, must be familiar with the safety measures aimed at:

- compliance fire protection
- principles of handling pressure vessels
- connection to automated equipment to supply electric. energy
- use of protective equipment-handling materials with preservatives
- use of automated equipment
- medical examinations
- handling ammunition
- observance of personal hygiene, to comply with environmental measures.

#### **The tasks for students:**

- ❖ To Repeat the procedure and documentation management when are stored spare parts.

## **References and further reading:**

[1] Tank 30-1 Skladování taktového a automobilního materiálu. Praha 1991.

[2] Č.j.:6272-1/2005/DP-3042. *Směrnice ukládání vojenského materiálu*. Praha: Sekce podpory MO, 2005.

## **T17 Efficiency of operation of military vehicles, reporting GME of serviceability**

### **Introduction**

- check for presence, completing the mission;
- sign to the class register;
- announcement of topic, aims of presentation, learning tasks and literature.

### **17.1 Long-term storage – general establishment**

They are altogether valid as for short-term storing.

### **17.2 Management of preparation for long term storage**

Preservation and storing consist of:

- Slack
- Execute period
- Evaluate period

Need to ensure workplace with material

### **17.3 Technical facilities for protection against degradation**

Depends on:

- Kind and type of VTM
- Character, size and weight of VTM
- Method of preservation
- Conditions of storing
- Accessories of workspace for storing

### **17.4 Technical means for storage**

- Travelling preservation station
- Miniature preservation set (MIKOS)
- Preservation device
- Welding device for plastic materials
- Dehumidifier
- Device for spray application of paint and preserves
- Device for make an aerosol of corrosion inhibitors

## **17.5 Explanation of equipment storage**

Storing equipment to PE cover (polyethylene foliage)

Technological process – preparation of storing place, coating sharp stumps, preparation of PE covers, storing technique to covers, welding, dehumidifier placing, hygroscope placing, welding an adapter, weld inspection, making a register about storing to documentation book.

- Storing to SM cover
- Storing to F cover

## **17.6 Book (records) of stored equipment**

It is storage document for whole system of preservation.

It is used for:

- Review and evidence
- work on equipment
- control of main technical data
- expression of commission of leadership
- records of extraction for control
- valuation of equipment

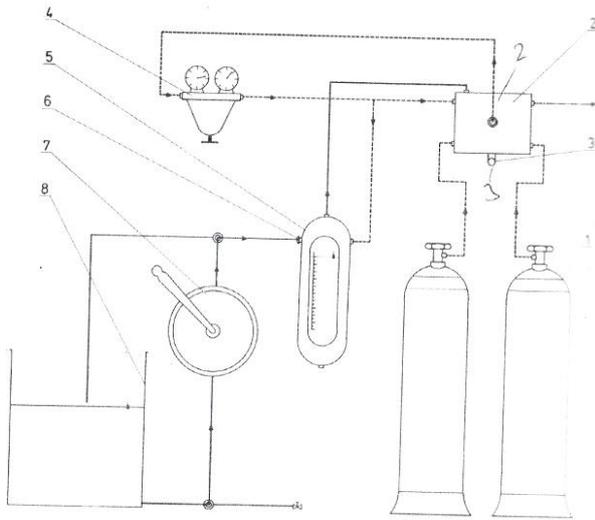
## **17.7 Preservative device PK-1**

It is a preservation device for preservation of working space especially for tanks and engines others have duty vehicles.

This set includes:

Air bottle, mixer - four-way distribution, valve for fulfilling the bottle, reducing valve, measured jar, reverse valve, pump, tank, oil, pressure air and oil fog

## Konzervačný prístroj PK-1



**Figure 4** Preservation device

### The tasks for students:

- ❖ Draw and describe Preservation device PK-1, explain how it works.

### References and further reading:

[1] Tank 30-1 Skladování taktového a automobilního materiálu. Praha 1991.

[2] Č.j.:6272-1/2005/DP-3042. *Směrnice ukládání vojenského materiálu*. Praha: Sekce podpory MO, 2005.

## **T18 Efficiency of operation of military vehicles, reporting GME of serviceability**

### **Introduction**

- check for presence, completing the mission;
- sign to the class register;
- announcement of topic, aims of presentation, learning tasks and literature.

### **18.1 Perform of emission checks (EC)**

Because armed forces are given to specific tasks and organization of operating, they haven't duty stand vehicles to periodical technical and emission control for all armed forces vehicle.

### **18.2 Execute of technical check (ETC)**

#### **Vehicles succumb to ETC and emission check**

In ACR these vehicles are succumb to **ETC** T and emission control:

- **All road vehicles**  
(Motorbikes, cars, bus, lorries/van, special vehicles, trailers, etc.)  
If they engaged in group „Common use-operational“,
- **Unusual vehicles** like a tractor, mobile or trailer labor machine , if they engaged in group „Common use-operational“,
- **Military vehicles**, if they will be used for transport or duty task on public roadway,
  - Equipped with blue warning light, possibly with special sound warning device (ambulance service etc.),
  - Join to military driving school,
  - Established to transport dangerous thing
  - Established to long-term transport task to provide common activity for army unit,

All vehicles insure according to CZ law 168/1999 Sb.

#### **Method of check**

Technical checks on military vehicles are performed by possibility of army unit in military MOT and EC or in civilian stations.

For vehicles technical approved by military police (military vehicles) are preferred technical check and emission control in military accredited institution.

In civilian stations for MOT and EC are check vehicles which was technical approved by Ministry for transport and road CZ (road vehicles), and if it economical, for example throughput reason, may be their check some military vehicles.

Period of check:

Vehicles serve in army are MOT or EC check in period by CZ law § 40 number 56/2001 Sb

After technical check in MOT staff of **ETC** paste inspecting label on rear registration plate of these vehicle and wrote this in to operation notebook, part „11. Note about technical check in MOT (TP) and placing a highway label (D)

If was found during technical check in MOT on military vehicle malfunction by CZ law letter c) § 49 law č. 56/2001 Sb. (dangerous malfunction), is running of this vehicle **forbidden** as long as next technical check.

### **18.3 Station of technical check and paperwork of documentation - STC- chief of STS**

Chief STS – perform or organization checking of technical condition and capability of driver before departure to unit duty. He is giving permission or denial to departure. His decision has definitive validity.

**Chief CTS obligation:**

- a) Forbid departure of vehicles which don't pass through technical check,
- b) Forbid departure of vehicles without correct documentation
- c) Organizing activity of trained staff,
- d) Keep station of technical check in good condition,
- e) Perform technical check of all equipment, include these which come back from duty
- f) Like a commit member appoint by commander of unit, check equipment before short term or long term storage.
- g) Keep and lead properly administration of documentation

With his experience be assistance to commander of unit to improved live in park of equipment.

### **18.4 Evaluation of vehicle technical condition**

Basic literature is focused on performing technical check and performing evaluation of vehicle technical condition.

Aid for evaluation is focused on performing and within evaluation of „specialized training of logistic unit and facility“ and „Logistics support“.

In logistics support area is control:

- 1 ) Logistics training
- 2 ) Provision by materials
- 3 ) Secure of operation and services
- 4 ) Status of weaponry and equipment
- 5 ) logistic of air forces (only at air unit )

### **Operation and repair of equipment and other technique**

Is evaluating organization of operation, storage of military equipment (MiE), organizing of technical supervision, organizing of metrological supervision, and presentation of extraordinary events and accident of MiE, park service, organizing of repairing.

#### Organization of operation

Organization of operation with MiE is evaluating in agreement with regulation for operation of MiE, valid orders and directive. Is classified „**secure**“ if it is fulfils these requirements:

- MiE is running by the purpose with observance of determined norm usage operation unit, rules and safety provision;
- MiE is running by weeks and year's operational plans;
- is keep register of MiE usage operation unit. Data of usage operation unit are in time written to the notepad (operating and technical documentation) and prescribed way presented to another processing. For observation of operation and maintenance with MiE are used relevant project;
- takeover and handover of MiE were perform properly, MiE were put in operation properly, staff are ready to operate with MiE;
- MiE are assign to unit and staff. Drivers are sort to MiE by relevant authorization and by given requirement. Documentation is properly fill out;
- commanders inspections of MiE are meet and are performed in given date;
- MiE are used properly, quality and usage of POL is periodically check and assess;
- Operation and technical documentation of MiE are complete and rightly kept;
- revision of operation condition MiE is periodical and are accept corresponding action

Organization of operation with MiE is evaluating „**secure with limit**“ if it is unfulfilled maximum 2 from last 6 requirements.

Organization of operation with MiE is evaluating „**unsecure**“ if it unfulfilled one from first 3 requirements or more then 3 from last requirements

### **TECHNICAL INCAPABILITY TO OPERATION OF VEHICLES**

(Law of MO č. 274/1999 Sb.) - § 26

(1) If approved military vehicle have disagreement with technical condition defeating for operation in that size when is endanger safety and continuity of operation or safety of persons and property or damaging of public roadway and devaluation of environment, can't be vehicle use to operation until malfunction are eliminated.

(2) For military safety vehicles are these malfunction from article 1 specially:

- a) if effectivity of breaking system isn't reach given limit, or difference between breaking intensity on wheels of the same axle is more then 30% ;
- b) if is necessary push breaking pedal again for breaking;

#### § 27 – Ban operation of military vehicle

(1) To military vehicle must be temporarily ban operation if:

- a) is found malfunction by § 26, result on these military vehicle is incapability to operation;
- b) data in technical documentation of military vehicle is disagree with reality;
- c) is data in technical documentation of military vehicle unlikable, rewritten or these documentation is very damaged.

#### The tasks for students:

- ❖ Draw and describe Preservation device PK-1, explain how it works.

#### References and further reading:

- [1] MAREŠ, J. EIS, K. Management údržby pozemní vojenské techniky. Brno 2008.
- [2] Č.j.: 6272-2/2006/DP-3042. *Směrnice pro používání pozemní vojenské techniky AČR v míru*. Praha: GŠ AČR, 2006.
- [3] Č.j.: 1 0 9 7 1 3 8 / 13 POMŮCKA 1795, Odborná směrnice náčelníka sekce logistiky GŠ AČR, Komplexní kontroly v Armádě České republiky a způsob hodnocení jejich výsledků. Praha, GŠ AČR, 1998.
- [4] HPraha, GŠ AČR, 1995. Str. 97.
- [5] Vyhláška MO č. 274/99 Sb. ze dne 15.11.1999, kterou se stanoví druhy a kategorie vojenských vozidel, schvalování jejich technické způsobilosti, provádění technických prohlídek vojenských vozidel a zkoušek technických zařízení vojenských vozidel.
- [6] Všeob P-5, *Parky vojenské techniky v působnosti Ministerstva obrany a provoz v nich*. 2003.

## **T19 Methods requiring of repair from the unit and relevant flow of spare parts to a specified repair**

### **Introduction**

- check for presence, completing the mission;
- sign to the class register;
- announcement of topic, aims of presentation, learning tasks and literature.

### **19.1 Spare parts requirements and their flows**

Supplies of all kinds of military material are created to secure living, training and readiness.

Supplies are divided into these groups:

- a) operational supplies,
- b) supplies for the transition from peacetime to wartime status
- c) supplies for securing direct combat operations

Operational supplies assure continuous and well-timed supplying of troops during the peacetime

Supplies for the transition from peacetime to wartime - are divided:

- mobilization supplies
- temporary supplies
- travelling supplies - usually for 1 day of operation = 1 DAU(daily amount of usage)

Supplies for securing direct combat operations - for conducting combat operations

- combat supplies
- central supplies

#### Criteria for calculating daily amount

When calculating daily amount of different types of gear and equipment and its own content, following criteria must be considered: predetermination of organizational unit; current health and safety standards; ....

Special supplies for different material groups (material classes).

e.g. 2.3 military transporting and supporting machinery; 2.4 electronics and optics a 4.1 Common use material

DOS calculation:  $1 \text{ DOS} = K \times P_k$

K- daily usage coefficient ,  $P_k$ - quantity of hardware.

**Calculating and determining type of DOS is based on these principles:**

1. Determining assortment

- range of assortment of spare parts
- assortment of spare parts can be the same for more types of hardware
- listing volume and mass units of spare parts

2. Determining coefficient of spare parts consumption for one day

it's necessary to divide spare parts into three groups

- a) SP with lifetime determined by  $P_j$
- b) SP with same "between-repairs" standards
- c) SP with different "between-repairs" standards

## **19.2 The repair methods of military equipment**

Depending on the nature of work and manipulation with demounted and damaged brackets, methods are divided:

- a) individual method – sections are not separated from vehicle
- b) section replacement method – sections in the vehicle are replaced – separated
- c) mixed repair method- optimal combination

Individual method: *advantages* - small amount of stocked SP

*Disadvantages:* - longer running time; - great elaboration; - complicated manipulation and record keeping.

Section replacement method: *advantages* - shorter running time; - minor elaboration; - easier assembly preparation.

*disadvantages:* - larger amount of sections and sub-sections; – higher acquisition costs.

Mixed repair method - optimal combination of methods above.

## **19.3 Repairs of military equipment**

From the perspective of division of work:

- a) terminal method

b) line method

- with subject – stationary
- with subject – mobile

Terminal method - process in which the same group of workers carries out all dismantling and mounting work. Vehicle and group stay in the same place. Advantages: - easier organization of work and its preparation; - fast possibility of introduction this reparation.

Disadvantages : - high professional requirements; ----

Line\_method

a- stationary (nodal) – carrying out the repairs in several specialized workplace.

b- with mobile subject (mass)- machinery or its groups, subgroups goes through a number of workplaces, placed according to technological procedure or according to working operations. Fluent or permanent movement.

## **19.4 Planning of equipment and material repairs**

### Significance and principles of planning repairs

Czech army has preventive system of repairs with aims to

- ✓ reduce uneconomic operation
- ✓ stop unexpected decommissioning of vehicle
- ✓ purposive planning of service of individual vehicles

### Planning purpose –

- secure combat readiness of vehicles
- uniform exploitation of capacities of maintenance divisions and bases, including VOP(MMC)
- timely return repaired equipment to units

### Important stuff during planning repairs

1. Capacitive and technological ways of maintenance companies
2. Knowledge and experiences of maintenance units workers
3. Ways to supply SP

#### 4. Future perspectives of ground gear and machinery

##### Repair planning includes

- a) OOR ( on occurrence repair)
- b) GR (general repair)
- c) revision after 10 years
- d) ZRe stated technical equipment a calibration
- e) general repairs of stated groups and subgroups
- f) calibration or validating measuring instruments
- g) checking and maintenance check-ups
- h) service maintenance
- i) long-term storage delivery way
- j) technical check-ups of weapons
- k) to allocate of capacity to carry out routine repairs (BO).

##### Repairs planning and control

In planning and reporting of maintenance activities is used ISL. Planning takes place in 3 periods

- 1) perspective planning
- 2) annual planning- service annual plan, annual plan of producing and maintenance activity, sent sheets of demands evidence

Documentation for professional control of metrology and technical surveillance

- 3) monthly planning \_ service monthly plan PVT(GMM) and plan of manufacturing and maintenance activity for a month – for maintenance unit!

The plans prepared \_at the level of\_a separate unit\_- a section:

- a) annual plan
- b) report, request card
- c) requirement sheets
- d) report of technical condition
- e) evidence of sent requirement sheets

f) monthly plan of service GMM

g) evidence of GMM

h) evidence of condition and exploitation of financial resources

i) documentation for expert leading of metrology and technical supervision, including survey of devices and measuring instruments.

### **The tasks for students:**

- ❖ Draw and describe Preservation device PK-1, explain how it works.

### **References and further reading:**

- [1] FURCH, J., MAREK, J., GLOS, J., TĚŠÍK, O. Opravy bojových a speciálních vozidel II, Brno 2008. [S-2890/2]
- [2] Č.j.: 6272-2/2006/DP-3042. *Směrnice pro používání pozemní vojenské techniky AČR v míru*. Praha: GŠ AČR, 2006.
- [3] Tank-1-1/č. *Tankové a automobilní technické zabezpečení vojsk*. Praha: MNO, 1978.
- [4] Log-2-4. *Vojskové opravy pozemní vojenské techniky*. Praha: MO, 2002.
- [5] Č.j.: 22815/11/2001-1200. *Směrnice pro používání pozemní vojenské techniky AČR v polních podmínkách*. Praha: GŠ AČR, 2001.
- [6] *Předpisy pro technologii oprav jednotlivých typů techniky*.
- [7] FURCH, J., MAREK, J., GLOS, J., TĚŠÍK, O. Opravy bojových a speciálních vozidel I, část I. Brno 2007. [S-2630/1]

## **T20 Methods requiring of repair from the unit and relevant flow of spare parts to a specified repair**

### **Introduction**

- check for presence, completing the mission;
- sign to the class register;
- announcement of topic, aims of presentation, learning tasks and literature.

### **20.1 Methods requiring of repairs**

The basic documentation for requesting and managing repairs include:

- Yearly / prospective maintenance plan
- reporting - request form,
- requirement form,
- written registration about technical condition of equipment,
- registration on handing over the vehicle to the repair,
- documentation of tendering,
- workshop documentation.

### **20.2 Repair equipment, - the requirements for permanent workshop**

The current required capabilities may affect the performance of tasks and enable logistics units, equipped workshop equipment - permanent and mobile.

- Workshop equipment is possible to divided to many respects:
- 1. According to the kinds
- 2. According to ensure the equipmen
- 3. In accordance with the characteristics of work

Permanent workshops - are designed to perform repair and maintenance equipment in peacetime conditions. They are located in buildings - adapted halls

Mobile\_workshop\_equipment

They are designed for the repair and maintenance of equipment in the field.

The requirements for the permanent workshop

- ♣ The repair within the specified range and technological sequence
- ♣ arrangement of workstations must conform to the method and organization of repairs,
- ♣ Compliance technological discipline
- ♣ Storing preparations
- ♣ Occupational Safety and health of
- ♣ Fire protection of
- ♣ The correct storing corrective fund equipment and materials

- ♣ Order and cleanliness in the premises.

### **20.3 Requirements imposed on mobile workshop**

- They are designed for the repair and maintenance of equipment in the field.
- They are located on a mobile chassis .
- They are equipped with necessary machinery and automation equipment, measuring and control equipment.

Requirements for \_mobile\_equipment:

The speed mobile vehicle

Resource with a high potential to overcome the terrain  
Ability to overcome water obstacles

Unified box the body  
Maximum self-sufficiency - energy sources

Secure of spare parts  
The possibility of working in different weather conditions  
Mobile device - used to transport a crew rest

### **20.4 Organization, facilities and manufacturing capabilities of permanent workshop**

Permanent workshops are designed for maintenance of equipment in peacetime conditions. They are located in buildings.

The repair platoon can consists of these teams:

Team of tank repair

Team of BVP repairs

Team of repair wheeled vehicles

Team of repair of armament equipment

Team of engineer equipment repairs

Team repairs of chemical equipment

Team repair coupling, the encryption tanks

Team repairs and maintenance accumulators

Team repairs of mechanical work

Team of electrical works

Recovery and evacuation team

For maintenance and storage of equipment and others...

## **20.5 Organization, facilities and manufacturing capabilities of mobile workshop**

Workshops are equipped by usually :

- **Mechanical workshop**
- **Blacksmith workshop**
- **Washing room of equipment**
- **Electrical workshop**
- **Small store for tools and spare parts**
- **Compressor room**

## **20.6 Evaluation of state of procedures**

- Evaluation of the state device:
  - a. determine the actual status
  - b. comparison current stage with standard
  - c. set of deviating from actual state of
  - d. to determine responsibility for deviations
  - e. the determination and implementation of measures to remedy the situation
- Checks are divided into:
  - ♣ Thematic
  - ♣ Specific
  - ♣ complex

## **20.7 Operations and handling with material**

Checks dismountable connections – permanent

Operations performed in the mobile workshops:

- grinding
- turning of
- cutting material against cutting - manually - with grinding
- drilling

Joining materials:

- Welding
- Soldering
- Gluing
- riveting

### The tasks for students:

- ✓ What works with material can be performed in mobile workshops?

### References and further reading:

- [1] Log-2-4. *Vojskové opravy pozemní vojenské techniky*. Praha: MO, 2002.
- [2] FURCH, J., MAREK, J., GLOS, J., TĚŠÍK, O. *Opravy bojových a speciálních vozidel II*, Brno 2008. [S-2890/2]
- [3] FURCH, J., MAREK, J., GLOS, J., TĚŠÍK, O. *Opravy bojových a speciálních vozidel I, část I*. Brno 2007. [S-2630/1]
- [4] Č.j.: 22815/11/2001-1200. *Směrnice pro používání pozemní vojenské techniky AČR v polních podmínkách*. Praha: GŠ AČR, 2001.
- [4] Log-2-4. *Vojskové opravy pozemní vojenské techniky*. Praha: MO, 2002.
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- [6] *Předpisy pro technologii oprav jednotlivých typů techniky*.
- [7] FURCH, J., MAREK, J., GLOS, J., TĚŠÍK, O. *Opravy bojových a speciálních vozidel I, část I*. Brno 2007. [S-2630/1]

## **T21 Parks of military equipment**

### **Introduction**

- check for presence, completing the mission;
- sign to the class register;
- announcement of topic, aims of presentation, learning tasks and literature.

In fleets of military equipment is used individual method for organization of vehicle operation, granting their proper using, storing, maintenance and storing while keeping rules of fire protection, ecology and cleanness of area.

### **21.1 Parks of equipment, usage and kinds**

Military park of equipment is bordered, protected and guarded area, which is used for storing, revision, maintenance, repairing of military vehicles and storing other needed material.

Commanders of units, who is assigned to this area is responsible for:

- condition of the area
- correct storing of military vehicles
- working safety, including ensure the environment

Parks according to usage divide:

- permanent parks
- field parks

#### Permanent parks

Permanent parks must be lit up, fenced and planted by green vegetation.

Must provide all of the functions of the fleet according to base prescription establishments.

### **21.2 Installation of parks of equipment (furnish**

**In the permanent parks must be ordered:**

- room for fleet chieftain
- room for fleet supervisor, his companions and driver for readiness
- technical station for revision
- objects and devices for maintenance after usage
- garage or shelters for vehicles
- fire-stopping shelters and equipment for disposition leaked oil products
- internal communication, entrances and exits, traffic signs

### 21.3 Garaging of vehicles in the park

Military vehicles stored in permanent fleet are placed in garages, under shelters or rarely on free outdoor area. For every vehicle is restricted one unified rank.

Space between vehicles and their distance from walls, pillars, doors and another fixed objects or fencing must be at least 0.3 m, on the side of the driver 0.8 m. Distance between facing and back of vehicles must be at least 0.8 m. Distance between back of the vehicle and walls, pillars, doors and another fixed objects or fencing must be at least 0.5 m.

### 21.4 Organization of operation in parks

#### Officials of parks:

**Chief of park (NP<sub>a</sub>)** is subordinate to logistic chief of logistics and he is straight superior to all other officials of park. He is making revision on organization of maintenance actions, repairs, storing and stocking military vehicles in the fleet.

**Chief of check station (N KTS)** is subordinate to **chief of park** and chief of logistics, or staff officer or battalion commander. He is responsible for vehicle inspection before leaving the fleet and for awareness of drivers for fulfilment objectives.

**Duty officer of park (DP<sub>a</sub>)** is a member of full-time shift, who is base establishments for his work are assigned in paragraph 362 to 367 prescription Zák1-1. According to conditions of division can be the operation of function of the fleet supervisor and his companions replaced by defend shift from civilian employee based on contract of employment.

⇒ Entering persons to park

⇒ Storing keys of vehicles

⇒ Vehicles leaving from fleet – military vehicle can be driven only by driver, who is legitimated for usage. Assignment must be published in order of commander of battalion. Driver must have with him:

- personal documents
- driving license
- military driving license or certificate for driving the military vehicles
- correctly filled order for use
- certificate of vehicle registration (previously technical certificate)
- record of insurance (if the vehicle has one).

⇒ Returning vehicles to fleet

**The tasks for students:**

- ✓ Draw an ideal military park of equipment, different part of park (buildings, stations etc.) put to the legend of park.

**References and further reading:**

- 1] Zákl-1, hlava 6, Základní řád ozbrojených sil České republiky. *Praha: MO, 2005.*
- [2] Všeob-P-5. Parky vojenské techniky v působnosti ministerstva obrany a provoz v nich. *Praha: MO, 2003.*

## T22 Parks of military equipment

### Introduction

- check for presence, completing the mission;
- sign to the class register;
- announcement of topic, aims of presentation, learning tasks and literature.

The parks equipment must fulfill all requirements for parking, maintenance, repair and protect vehicles against damage. Must as well be organized and parks field.

Field parks are established for the temporary layout of units and formations in the field for the tasks of combat training or special tasks outside the a garrison and during operations of multinational armed forces.

### 22.1 The normal mode and movement in the military park, departure and return.

Park equipment is shown on the attached diagram.

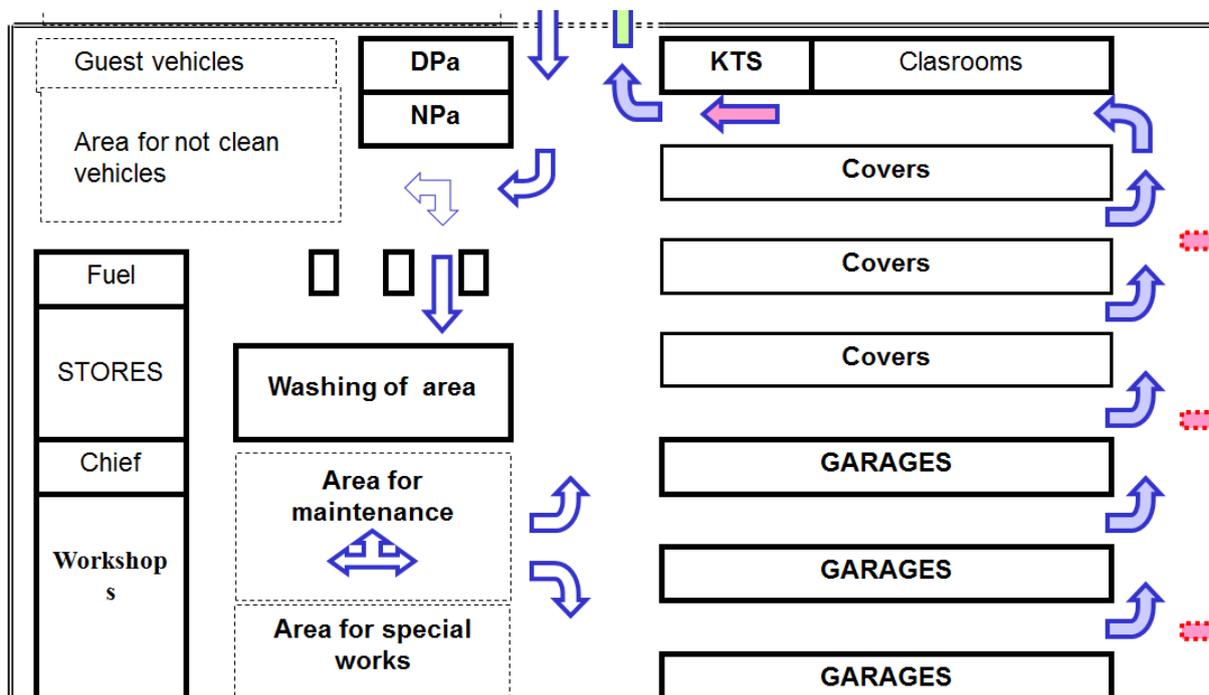


Figure 5 The parks of equipment structure

## **22.2 Field parks of equipment - the purpose and organization.**

The principles of operation of the internal service organizations including obligations park officials are the same as permanent parks, only adapted to the specific conditions and capabilities of units.

In a field military park are established:

- Station for the chief of park and duty officer and his subordinates
- Chief of technical check of vehicles,
- Area for military vehicles

Furthermore, in the field parks, as appropriate, establish park space for the refueling of fuel, cleaning, washing, maintenance and repair of vehicles.

## **22.3 Organization of maintenance in the field park of equipment**

Performed on the specific area. Fundamental maintenance is maintenance after use

It is organized: During field training - shootings, determined training or for water obstacles overcoming

Organizing of field parks and their equipment must provide easy and organized operation of military vehicles, while maintaining the principles of fire protection and environmental protection.

Check the technical condition of vehicles, their maintenance and repair can be performed only in places designated for this purpose and customized, meeting the requirements for the protection of water and soil from the adverse effects of harmful substances.

## **22.4 The precautions in field parks of equipment**

Environmental protection, safety and fire precautions when working in the park is governed by legislation (especially law 221/99 Sb and 262/2006 Sb.)

Special military regulations (mainly Všeob -P-5, Vševojsk-16-7) and other internal normative acts.

The documentation of the park are safety, fire and environmental regulations imposed by the supervisory park.

It should be emphasized content of precautions:

- safety regulations
- fire precautions

- environmental precautions

Protecting the environment (soil, water and air) is organized in accordance with the provisions of the regulations Všeob- P-5 and others

**The tasks for students:**

- Describe the optimal facilities military park of equipment

**References and further reading:**

- [1] Zákl-1, hlava 6, Základní řád ozbrojených sil České republiky. *Praha: MO, 2005.*
- [2] Všeob-P-5. Parky vojenské techniky v působnosti ministerstva obrany a provoz v nich. *Praha: MO, 2003.*
- [3] *Vševojsk-16-7*

## **T23 Parks of military equipment**

### **Introduction**

- check for presence, completing the mission;
- sign to the class register;
- announcement of topic, aims of presentation, learning tasks and literature.

### **23.1 Organizing of go into park of military equipment**

Enter of person in to park - Professional soldier and civil employee from own unit may enter in space of park after proof of identity.

In space of park when are park or storage vehicles and equipment may enter only person who have assign these equipment or their direct superior, command of object etc. Crew and drivers who prepare to departure, enter to park after submitting of valid order for use of equipment or ID.

Persons who isn't member of unit may enter in park only with agreement of unit commander.

#### **Departure of vehicles from park-**

Military vehicles are preparing for departure by crew (operator, driver) under lead by command of unit or authorized lieutenant.

After they made preparing, is vehicle stand to check on CTS. Chef of CTS check capability of vehicle and drivers to carry out their duty. Result of successful check confirm by his signature on front page of „Order for use of equipment“. Duty officer of park checks permission of chief of CTS on „Order for use of equipment“, check documentation and appearance of driver, made correspond note in „Record of departure and return of vehicle“ and give permission to departure vehicle from park.

### **23.2 Manners of equipment preparing to check by chief of CTS**

**Chief CTS** is subordinate to leader of park and leader of logistic unit, possibly leader of headquarters or commander of unit. He is responsible for preformatting technical check of vehicle before departure and capability drivers to carry out their duty.

Personally permit use of vehicle, which is in right technical condition. If chef CTS decide about incapability of military vehicle his decision has definitive validity. Change it can only him after check the elimination of malfunction.

### **23.3 Move and navigation of equipment in parks**

Equipment in park are move only in presence of commander and with guidance.

Operation is realized on roadway with common system of road signs and speed is limited to 10 km/h.

## **23.4 The build the columns of and giving orders for move**

### **Possibility columns of vehicles**

Homogeneous, mixed

Order to move is in direction Všeob P-37 and include:

- purpose of move, axis, order of vehicles, dangerous places, speed, distance between vehicles, activity at the accident – crash, way of lead and connect in to flow.

### **The tasks for students:**

- **What kind of columns of vehicle do you know?**
- **To build columns of vehicle from served summary of vehicle which you have move to training.**

### **References and further reading:**

- [1] Všeob-P-5. Parky vojenské techniky v působnosti ministerstva obrany a provoz v nich. Praha: MO, 2003.
- [2] Všeob P-37. Pravidla používání vozidel v rezortu ministerstva obrany. Praha: MO, 2009.

## **T24 Parks of military equipment and final seminar**

### **Introduction**

- check for presence, completing the mission;
- sign to the class register;
- announcement of topic, aims of presentation, learning tasks and literature.

### **24.1 Recapitulation of military parks of equipment**

Purpose of military parks and types of military parks

Main areas of machinery park, requisites and buildings of optimal military machinery

Main officials providing operation of military parks of equipment, responsibilities.

Safety, fire safety and ecological precautions

### **24.2 Execute final examination of main topics discussed by based on written TEST:**

Discussed topic will be checked by final writing test, based on topic summary. Some questions will be Some questions are as a, b, c ..type and some will require short answer or a scheme.

Test 1

Who lost this test, will have other possibilities as correction test.(Test 2)

### **24.3 To perform theoretical preparation before practical training – recovering and evacuation of vehicles**

In range

- a) Tools, instruments and aids for selfrecovering, recovering and evacuation of GME.
- b) Reasons of stuck and levels of stuck – commander management during operations.
- c) Selfrecovering, means and principles used in ACR.
- d) Recovering, means and principles used in the Czech army and evacuation of vehicles.
- e) Evacuation of GME, means and principles used in the Czech army.
- d) Safety precautions during selfrecovering, recovering and evacuation of GME.
- f) Interoperability in frame of NATO armies during recovering and evacuation of GME.

## **The tasks for students:**

Recapitulate the topic and prepare yourself for practical work:

1. Safety precautions for selcecovering, recovering, and evacuation of GME.
2. Prepare yourself for a practical realization, repeat main recovering, and evacuation of GME means used in the Czech army.

## **References and further reading:**

- [1] Tank-6-5. *Pravidla řízení bojových vozidel*. Praha: MNO, 1977.
- [2] Č.j.: 6272-2/2006/DP-3042. *Směrnice pro používání pozemní vojenské techniky AČR v míru*. Praha: GŠ AČR, 2006.
- [3] Všeob P-5, Parky techniky.
- [4] *Tank T-72 M4CZ. Příručka řidiče*. Nový Jičín: VOP 025, 2003.
- [5] Tank-26-8. *Bojové vozidlo pěchoty BVP-1. Technický popis*. Praha: MNO, 1977.
- [6] BIHUNEC, J., KELNAR, V. *Vyprošťování tankové a automobilové techniky*. Praha: MO, 1994.
- [7] FURCH, J., MAREK, J., GLOS, J., TĚŠÍK, O. *Opravy bojových a speciálních vozidel I, část I*. Brno 2007. [S-2630/1]

## **T 25 – 8 sem Recovering of ground military equipment (GME)**

### **25.1 Pick up the equipment and move them on area for practical training**

- To appoint the commanders of vehicles, pickup in military parks of vehicles and build column of vehicles.
- To tell orders to move
- Own move to recovery training area.

### **25.2 Practical training consist of – self recovering, recovering and evacuation of immobile equipment**

#### **Planned workplace:**

I. Station - Recovery tracked vehicles- By direct towing (straight)  
- recovery using by pulleys  
- (vehicle: jammed BVP II – recovery tank VT 72 B)

II. Station – Self recovering tracked vehicles  
- Use the beam  
- With anchoring of track BVP II  
- (Vehicle: 2 × jammed BVP II)

III. Station – Self recovering of wheeled vehicles  
T 810 using a winch and natural anchors (bench of trees)

IV. Station – Evacuation of immobile equipment

a) variant - tracked equipment

(vehicles: immobile - damaged vehicle BVP II – evacuated wrecker – VPV

– Evacuation of immobile equipment

b) variant - wheeled vehicles

(vehicle: immobile - damaged vehicle lorry T 810 - evacuated wrecker - AV 15)  
Evacuation to realize by lift on the crane with

V. Handling equipment for low loader P 50 N

Immobile equipment is extended on the out feed means and moved to MCP in the field,

In peace in the workshop hall for repair.

(vehicle: immobile - damaged vehicle VT 72 B – evacuation set of VT T815 tractor with semitrailer P-50N).

- For recovering and evacuation of equipment to keep all safety precautions

### **25.3 Maintenance after use**

Implement maintenance after use in full range.

- To begin by cleaning, washing vehicles after training.
- Follow the technological procedures on the small bridges for maintenance.
- After transport to the park to refuel equipment and to park vehicles on parking lots

### **References and further reading:**

[1] Zák1-1, hlava 6, Základní řád ozbrojených sil České republiky. *Praha: MO, 2005.*

[2] Všeob-P-5. Parky vojenské techniky v působnosti ministerstva obrany a provoz v nich. *Praha: MO, 2003.*

[3] *Vševojsk-16-7*

[4]Všeob P-37. Pravidla používání vozidel v rezortu ministerstva obrany. *Praha: MO, 2009.*

## **T 26 – 8 sem Maintenance of GME**

### **26.1 Methodological picking up equipment from park, including entering into park equipment**

To appoint the commanders of vehicles, pickup planned fleet of vehicles and build column of vehicles.

Establish commander vehicles and enter them specific tasks to be addressed in connection with the entrance to the park and communications with duty officer of park.

Pick up equipment from the park and build column according to proper rules.

### **26.2 The practical activities in navigation of equipment, training activities under the supervision of a military traffic control service**

During picked up equipment from park use navigation by signals of arms.

On the beginning to practice the activity and then realized departure from park of equipment. Build column practically and after give the order for move.

During this „pass short course” of a military traffic control service " under management of specialist in this branch.

To learn the rights and obligations of a military traffic control service (VPS) - what you has to do and what can to do. The obligations of the driver when is checked by police. (VPS).

### **26.3 Exhibition of practical activities of the Chief of technical check station at his post**

- Practical activities NKTS when checking vehicle ready for use.
- The management documentation of NKTS at the workplace
- Activity NKTS with the vehicle when checking eligibility
- Obligations NKTS.

### **26.4 Practical putting into practice of the various kinds of fundamental maintenance**

Practical maintenance after use for a particular vehicle wheeled and tracked.

Demonstration of implementation of basic maintenance - for wheeled vehicles.

Perform their own maintenance and registration in the relevant documentation.

Demonstration of implementation TÚ 1 - LRD vehicles

Demonstration of implementation TÚ 2 - vehicles Pandur (DINGO, IVECO).

### **References and further reading:**

[1] Zák1-1, hlava 6, Základní řád ozbrojených sil České republiky. *Praha: MO, 2005.*

[2] Všeob-P-5. Parky vojenské techniky v působnosti ministerstva obrany a provoz v nich. *Praha: MO, 2003.*

[3] *Vševojsk-16-7*

[4]Všeob P-37. Pravidla používání vozidel v rezortu ministerstva obrany. *Praha: MO, 2009.*