

Mobilna základňa na ochranu kritickej infraštruktúry.



Vypracoval: R. Maník

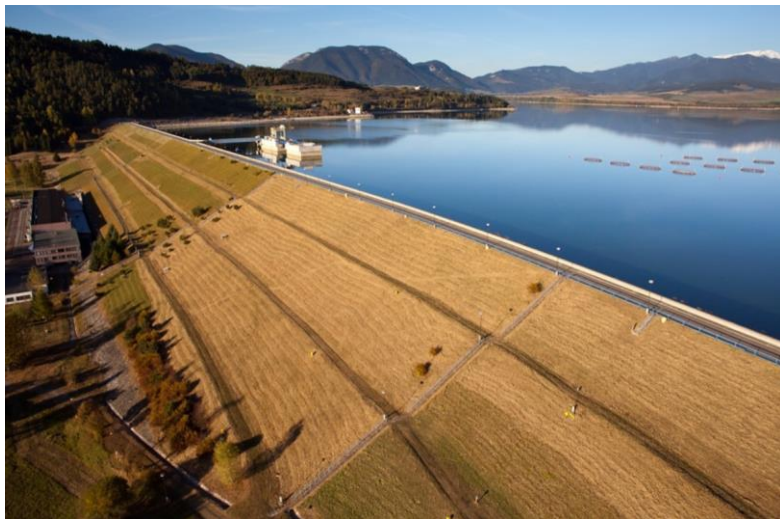
March 2023

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Zetor

ENGINEERING

Kritická infraštruktúra



KONGSBERG – PROTECTOR RS6

Integrated Weapons:

M230 (30 x 113) with M240 (7,62) coax and 1x Javelin missile coaxially or SPIKE

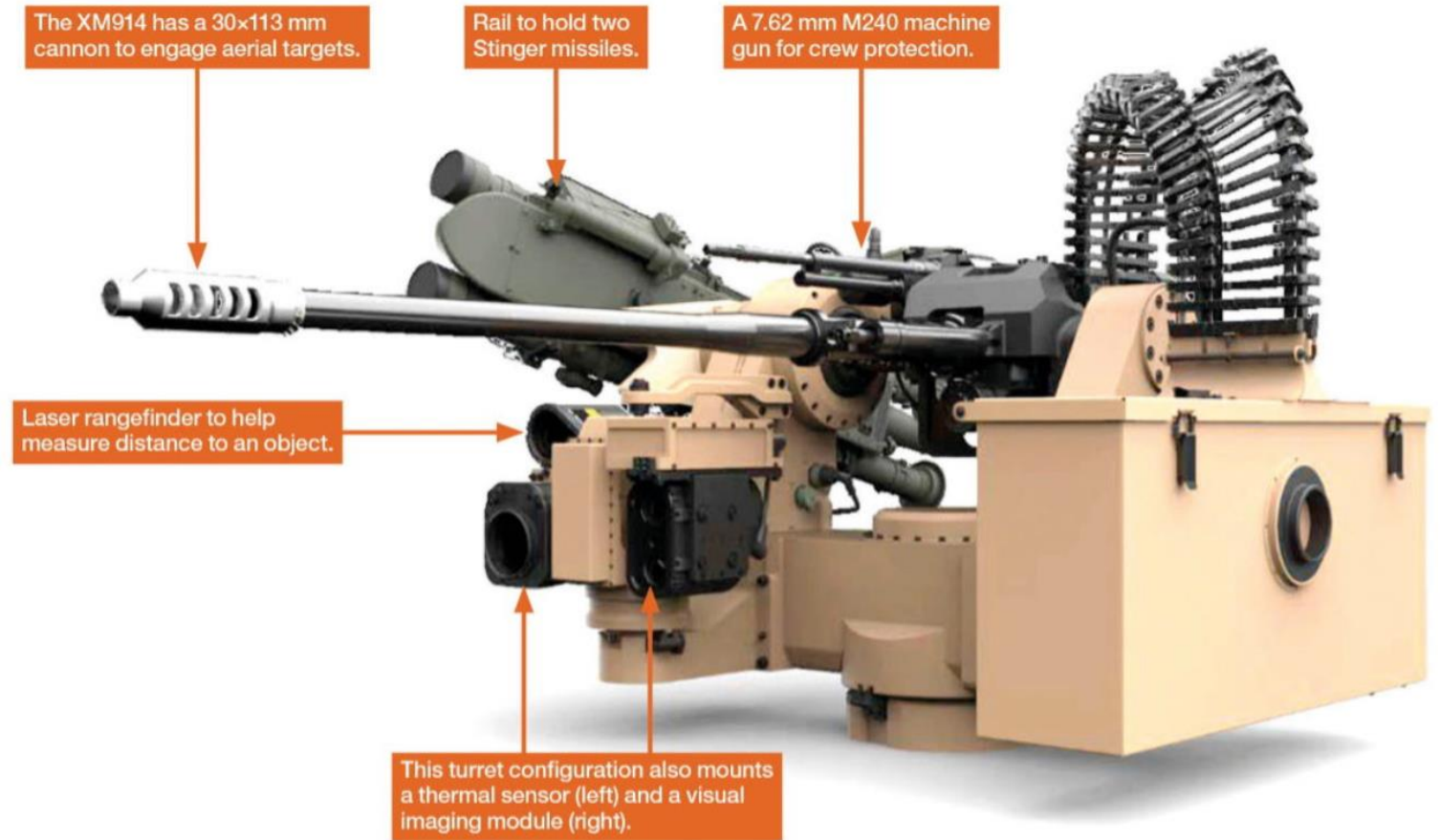
Dual 40/50 using 40 mm AGL and Browning M2 (12,7) witch also allows for missile coaxially



KONGSBERG – PROTECTOR RS6

Integrated Weapons:

M230 (30 x 113) with M240 (7,62) coax and 2x Stinger missiles coaxially



RWS PROTECTOR RS6

PROTECTOR



KONGSBERG REMOTE WEAPON SYSTEMS

PROTECTOR RS6

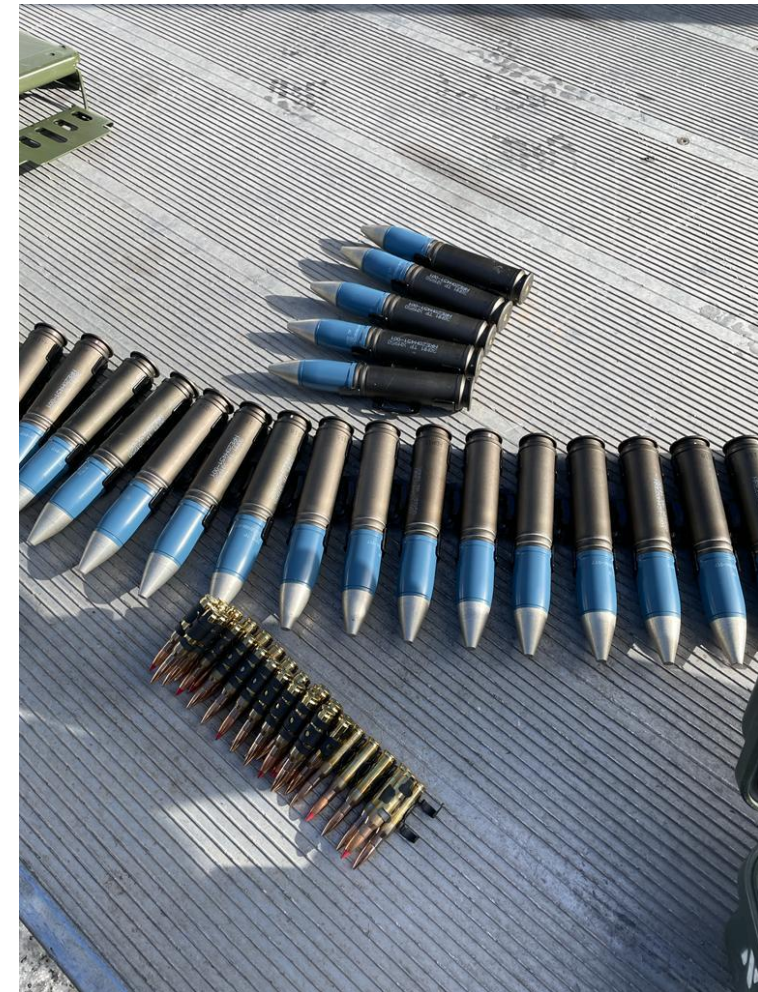
TECHNICAL DATA

Technical Specifications (Depending on variant)	Weight excl. Weapon & Ammunition: 342kg (754 lbs) Height excl. Weapon & Ammunition: 830 mm
Cameras / Sensors:	Flexibility to meet customers day, night and LRF requirements
Dynamic Capabilities	Azimuth 360° unlimited range Elevation -20° to +60°
Integrated Weapons	XM914 (30 x 113 mm) with M240 (7.62) coax and 1x Javelin missile coaxially XM914 (30 x 113 mm) with M240 (7.62) coax and 2x Stinger missiles coaxially Dual 40/50 using 40 mm AGL and Brown-ing M2 (12.7 mm), which also allows for missiles coaxially

Munícia

Ciel': Testovanie presnosti veží RS6 a RS4 + ZG 06

- ❖ Muníciu zabezpečila spoločnosť NAMO
- ❖ Munícia 7,62 x 51
- ❖ Munícia 12,7 x 99
- ❖ Munícia 30 x113 XM950



- ❖ Date: 20 - 24.03.2023

Terče pre RS6

Ciel': Testovanie presnosti a účinnosti RS6 na vozidle ZG 06

- ❖ Pre testovanie presnosti strelby bolo použité elektronický terč od firmy SAAB 2,3 m x 2,3m



- ❖ Date: 20 - 24.03.2023



Prezentačné terče pre RS4

Ciel': Testovanie presnosti a účinnosti RS4 na vozidle ZG 06



- ❖ Pre testovanie presnosti strelby bolo použité elektronický terč od firmy SAAB 2,3 m x 2,3m

- ❖ Date: 20 - 24.03.2023

Testovanie veže Protector RS6 na ZG 06

Cieľ: Testovanie presnosti a chovanie vozidla ZG s vežou

- ❖ Nastavenie zbrane
- ❖ Zastreľovanie zbrane
- ❖ Zahrievanie zbrane
- ❖ Testovacia strelba na 230 m
 - Static – Static
 - Moving – static
 - Static – Moving
 - Moving – Moving

- ❖ Testovacia strelba na 950 m
 - Static – Static
 - Moving – static

- ❖ Testovacia strelba na 1600 m
 - Static – Static

- ❖ Vyhodnotenie
- ❖ Návrat na základňu
- ❖ Demontáž veže a pracoviska strelca RS6
- ❖ Montáž veže RS4
- ❖ Montáž pracoviska strelca RS4
- ❖ Testovanie funkčnosti RS6
- ❖ Vozidlo pripravené na prevoz na strelnicu a testovanie strelby

- ❖ Date: 20.03.2023



Testovanie veže Protector RS6 na ZG 06

Cieľ: Testovanie veže RS6 na 230 m



❖ Date: 20.03.2023 and 24.03.2023

Testovanie veže Protector RS6 na ZG 06

Ciel': Testovanie veže RS6 na 950m



❖ Date: 20.03.2023 and 24.03.2023

Testovanie veže Protector RS6 na ZG 06



Cieľ: Testovanie veže RS6 na 1600m



❖ Date: 20.03.2023 and 24.03.2023

ZETOR GERLACH 4x4 ATV - 06



➤ Hull – high specification

- Accommodates 6 crew with large cargo space to rear

➤ Powertrain – excellent performance and mobility

- 6 Cylinder 240kW engine / 6 speed automatic transmission
- Double Wishbone Independent suspension

➤ Brake & Steering Certified to European Standards

- Air/hydraulic, ABS brakes – meets ECE R-13
- Hydraulic assist steering, compliant with ECE 79

➤ Wheels & Tire with CTIS – for enhanced mobility in sand

- 14R20 / Aluminum Rim, Run Flat & CTIS

➤ Performance specified for optimum utility

- Max. speed: 110 km/h - limiter
- Range: 600 km with 220 l tank
- Engine: 240 kW - torque 1300 Nm
- Wheelbase: 3,6 m
- Clearance 465 mm
- Turning radius: 7,5 m

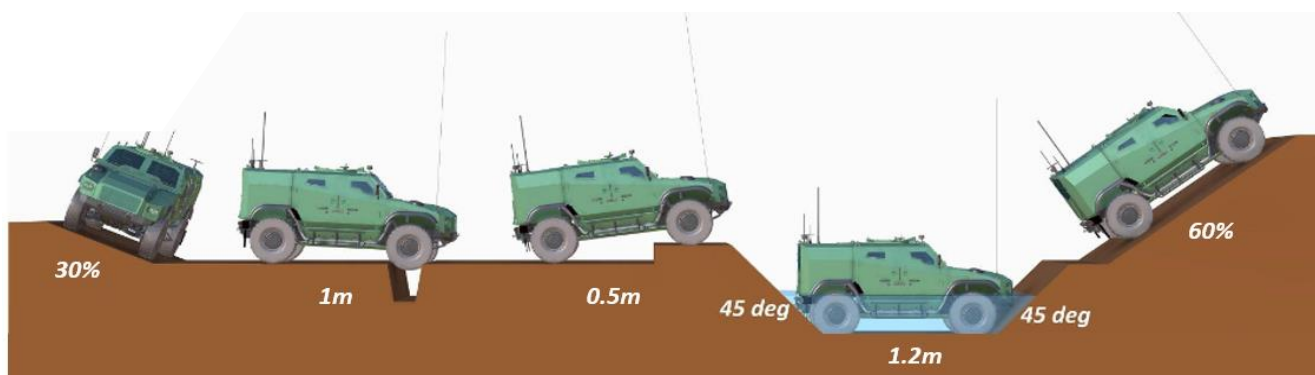
➤ Base Measurements – Provided for reference:

- Width: 2.56 m
- Height: 2,60 m (101 in)
- Length: 5,92 m (233 in)
- Unladen: 13 100 kg (28 880 lbs)
- Payload: 2 100 kg (4 630 lbs)
- GVW: 15 200 kg (33 510 lbs)

Obstacle Performance

- **Approach and Departure**
 - Approach angle: 45° / Departure Angle: 45°

- **Obstacle performance**
 - Trench cross 1,0 m
 - Step Climb 0,5 m
 - Fording 1,2 m
 - Grade (Forward) 60%
 - Grade (Reverse) 60%
 - Side slope 30° (57%)



ETAPA č.1 Testovanie vozidla ZG 03 – STANAG 4357

- ❖ **06/2018 Testovanie VTU Vyškov**
 - Meranie základných parametrov vozidla podľa

- ❖ **08/2018: Testovanie VTU Vyškov**
 - Meranie statickej priečnej stability

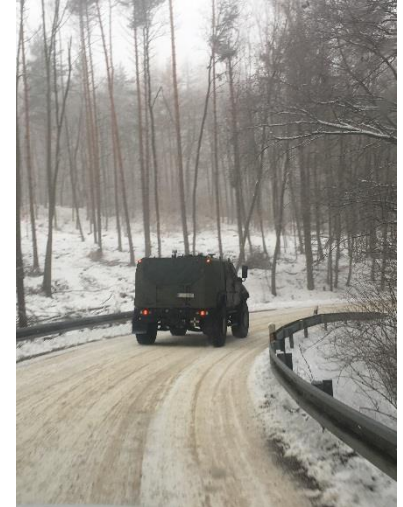


ETAPA č.2 Testovanie vozidla ZG 03 – STANAG 4357

- ❖ **01/2019 Testovanie VTU Vyškov**
 - Meranie parkovacej brzdy
 - Meranie ťažiska

- ❖ **06/2019: Testovanie VTU Vyškov – polygon Tatra**
 - Jazda v bočnom náklone

- ❖ **06/2019: Testovanie VTU Vyškov**
 - Maximálna rýchlosť
 - Rozmery
 - Polomery zatáčania
 - Jazdné skúšky a dojazd – zima / jar



ETAPA č.3 Testovanie vozidla ZG 04 MPK kit – STANAG 4569 Vol2 3a/b



ETAPA č.3 Testovanie vozidla ZG 04 MPK kit – STANAG 4569 Vol2 3a/b



Test Report Version 1.1 Date 21.11.2019

RHEINMETALL DEFENCE

Title: 638100-2019-09-30-Test Report-Mine-CW38-3b-V1.1

Classification: Company Confidential Page 1 of 99

Test Report

8 kg TNT – 3b Mine Test: under belly
8 kg TNT – 3a Mine Test: under front wheel

Gerlach 4x4

Project No. 638100

Issued by/date/signature: G. Teslau, 21st November 2019

Released by/date/signature: W. Münch, 21st November 2019

Approved by/date/signature: R. Fischer, 21st November 2019

Number of originals: NA
Number of this original: NA

Number of pages: 99
Number of pages Company Confidential: 99

Please respect Security Notes on Page 2!

Rheinmetall Protection Systems GmbH Branch Development
Im Rohmwehler 41 - 53379 Lohmar, Germany - Phone +49 2205 89408 0 - Fax +49 2205 89408 580 - Registered Office: Bonn
Bonn Local court C/R no. HRB 22942 - Tax No.: 206/5946/0625 - VAT No.: DE 251 580 678

Beschussamt Ulm
Eich- und Beschusswesen Baden-Württemberg
Staatliche Prüf- und Zertifizierungsstelle für Waffen- und Sicherheitstechnik
Legal verification and certification office for weapons and security engineering

Zertifikat - Certificate

S 19 0050 02 / Z

Fahrzeug-Sprengprüfung
Vehicle-blast test

Beschussamt Ulm
Eich- und Beschusswesen Baden-Württemberg
Staatliche Prüf- und Zertifizierungsstelle für Waffen- und Sicherheitstechnik
Legal verification and certification office for weapons and security engineering

Zertifikat - Certificate

S 19 0050 01 / Z

Fahrzeug-Sprengprüfung
Vehicle-blast test

Antragsteller Applicant: Zetor Engineering s.r.o. 628 00 Brno / Česká republika

Hersteller Fahrzeug Manufacturer vehicle: Zetor Engineering s.r.o. 628 00 Brno / Česká republika

Hersteller Schutz Manufacturer protection: Rheinmetall Protection Systems GmbH D-53797 Lohmar

Ort und Datum der Prüfung Location and test date (d.m.y.): Schrobenhausen, 17.09.2019

Prüfanforderung und Verfahren Test requirement and method: Nach Kundenspezifikation in Anlehnung an STANAG 4569, Prüfmethode AEP55, Vol. 2, Level 3b (Mai 2014) (mitig unterhalb der Waarne, Fondbereich)

Gegenstand der Zertifizierung Item under certification: Fahrzeug Vehicle

Typenbezeichnung Product reference: Zetor Gerlach 4x4 (RPS 44940, Projekt 638100-9)

Das Fahrzeug erfüllt alle Leistungskriterien entsprechend der Kundenspezifikation in Anlehnung an STANAG 4569, AEP55, Vol. 2, Level 3b (Mai 2014).
Details siehe Prüfbericht S 19 0050 01 / B
The vehicle passed all the mandatory performance criteria according Applicant's specifications in accordance with STANAG 4569, AEP55, Vol. 2, Level 3b (May 2014).
Details see test report S 19 0050 01 / B.

Hiermit bestätigen wir, dass sämtliche zur Zertifizierung eingesetzten Prüfmittel, Messmittel und Hilfsmittel entsprechend dem akkreditierten System qualifiziert bzw. metrologisch rückgeführt sind.
We hereby confirm that all test devices, measuring tools and aids used for the certification are qualified or metrologically traceable to the accredited system.

Zertifikate ohne Unterschrift und Dienstsiegel haben keine Gültigkeit. Dieses Zertifikat darf nur vollständig und unverändert weiterverbreitet werden. Auszüge oder Änderungen bedürfen der Genehmigung des Beschussamtes Ulm.
Only the original certificate stamped and signed by the Proof House is valid. This certificate may only be passed on in its entirety and without modification. The use of parts of this certificate is allowed only with the express consent of the Beschussamt Ulm.
The test report is basic and part of the certificate.

Ulm, den 01.10.2019

Beschussamt Ulm
Albstraße 74
89081 Ulm
Tel.: 0731-9 88 51-0
Fax: 0731-9 88 51-99
beschussamt@pfz.bwl.de
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Akkreditierte Prüf- und Zertifizierungsstelle
DAkkS
Deutsche
Zertifizierungsstelle
DZ-1787-01-01

REIBUNGS-PRESDIUM
TUBINGEN

TONNER
Leiter der Zertifizierung
Head of certification

Beschussamt Ulm
Eich- und Beschusswesen Baden-Württemberg
Staatliche Prüf- und Zertifizierungsstelle für Waffen- und Sicherheitstechnik
Legal verification and certification office for weapons and security engineering

Zertifikat - Certificate

S 19 0050 03 / Z

Fahrzeug-Sprengprüfung
Vehicle-blast test

Beschussamt Ulm
Eich- und Beschusswesen Baden-Württemberg
Staatliche Prüf- und Zertifizierungsstelle für Waffen- und Sicherheitstechnik
Legal verification and certification office for weapons and security engineering

Zertifikat - Certificate

S 19 0050 04 / Z

Fahrzeug-Sprengprüfung
Vehicle-blast test

Antragsteller Applicant: Zetor Engineering Slovakia a.s. 014 83 Bytča / Slovenská

Hersteller Fahrzeug Manufacturer vehicle: Zetor Engineering Slovakia a.s. 014 83 Bytča / Slovenská

Hersteller Schutz Manufacturer protection: Rheinmetall Protection Systems GmbH D-53797 Lohmar

Ort und Datum der Prüfung Location and test date (d.m.y.): Schrobenhausen, 19.09.2019

Prüfanforderung und Verfahren Test requirement and method: Nach Kundenspezifikation in Anlehnung an STANAG 4569, Prüfmethode AEP55, Vol. 2, Level 3a (Mai 2014) (unter Vorderrad, Seite links)

Gegenstand der Zertifizierung Item under certification: Fahrzeug Vehicle

Typenbezeichnung Product reference: Zetor Gerlach 4x4 (RPS 44941, Projekt 638100-9)

Das Fahrzeug erfüllt alle Leistungskriterien entsprechend der Kundenspezifikation in Anlehnung an STANAG 4569, AEP55, Vol. 2, Level 3a (Mai 2014).
Details siehe Prüfbericht S 19 0050 04 / B
The vehicle passed all the mandatory performance criteria according Applicant's specifications in accordance with STANAG 4569, AEP55, Vol. 2, Level 3a (May 2014).
Details see test report S 19 0050 04 / B.

Hiermit bestätigen wir, dass sämtliche zur Zertifizierung eingesetzten Prüfmittel, Messmittel und Hilfsmittel entsprechend dem akkreditierten System qualifiziert bzw. metrologisch rückgeführt sind.
We hereby confirm that all test devices, measuring tools and aids used for the certification are qualified or metrologically traceable to the accredited system.

Zertifikate ohne Unterschrift und Dienstsiegel haben keine Gültigkeit. Dieses Zertifikat darf nur vollständig und unverändert weiterverbreitet werden. Auszüge oder Änderungen bedürfen der Genehmigung des Beschussamtes Ulm.
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The test report is basic and part of the certificate.

Ulm, den 01.10.2019

Beschussamt Ulm
Albstraße 74
89081 Ulm
Tel.: 0731-9 88 51-0
Fax: 0731-9 88 51-99
beschussamt@pfz.bwl.de
www.beschussamt.ulm.de

Akkreditierte Prüf- und Zertifizierungsstelle
DAkkS
Deutsche
Zertifizierungsstelle
DZ-1787-01-01

REIBUNGS-PRESDIUM
TUBINGEN

TONNER
Leiter der Zertifizierung
Head of certification

ETAPA č.4 Testovanie vozidla ZG 03 – STANAG 4357, STANAG 2805

- ❖ **06 - 10/2019 Testovanie VTU Vyškov**
 - Jazdné skúšky vozidla leto/jeseň
 - Súhrnný protokol 01/2020 (30 000 km)

- ❖ **12/2019 Testovanie VTU Vyškov**
 - Skúška brodenia



ETAPA č.5 Testovanie vozidla ZG 05 – STANAG 4357

❖ 10/2020 Testovanie VTU Vyškov

- Zábeh vozidla
- Rozbor olejov
- Hmotnosti
- Rozmery
- Prepraviteľnosť
- Zrýchlenie vozidla
- Rýchlosť vozidla
- Polomery zatáčania
- Priechodivosť vozidla
- Výstupnosť vozidla
- Prekročivosť vozidla
- Stúpavosť



ETAPA č.6 Testovanie vozidla ZG 06

❖ 01/2021 Testovanie VTU Vyškov

- Zábeh vozidla
- Rozbor olejov
- Hmotnosti
- Rozmery
- Jazdné vlastnosti - zima
- Testovanie – snehové reťaze



ETAPA č.7 Overovacie skúšky ZG 05

❖ 01/2020 – 05/2021 Testovanie VTSU Záhorie

- Hmotnosti + dováženie 14 550 kg
- Priechodivosť – jazdná dráha, prezentačná dráha, stúpavosť, rozjazd do kopca, zákop 1m, kolmý stupeň (Malá strelnica, krátka strelnica, pancierová strelnica)
- Jazdné skúšky 20 pracovných dní – piesok priestor „C“ (pieskovňa a stanovené jazdné trasy)

❖ 05 – 06 /2020 – Testovanie VTSU Záhorie - OPCIA

- Skúšky zadymovania Rheinmetall



Test & Validation



- A suite of tests has been completed across performance, mobility & protection, using 3rd party independent test facilities for validation and against defence standards
- Vehicles have completed > 60,000 km durability testing
- Result is a level of vehicle maturity rarely seen in defence programs

No	Test	Test Standard	Results
1	Static transverse stability	STANAG 4357; AVTP 1; J-4-720/10	32°
2	Dynamic transverse stability	STANAG 4357; AVTP 1; J-4-720/17; J-4-720/30	30°
3	Driving tests combined terrain	STANAG 4357; AVTP 1/11-10:RAM-D;	40,000 km (all seasons)
4	Maximum speed	STANAG 4357; AVTP 1; J-4-720/17; J-4-720/30	117 km/h
5	Parking brake	STANAG 4357; AVTP 1; J-4-720/10	38°
6	Centre of gravity	STANAG 4357; AVTP 1; J-4-720/14	Yt: 0,02m; Xt: 1,62m; Zt: 1,21m
7	Obstacle crossing	STANAG 4357; AVTP 1	Vertical step: 0,5m / Trench 1.0m
			Grade climb GVW: 30° (60%) F & R
8	Fording	STANAG 4357; AVTP 03-110; J-4-720/32	1,2 m
		STANAG 2805	
9	Diameter of rotation	STANAG 4357; AVTP 1; J-4-720/20; J-4-720/46	16,0 m
10	Dimensions of vehicle (LxWxH)	STANAG 4357; AVTP 1	5920mm x 2550mm x 2565mm
11	Logistics	STANAG 2165 Truck, Airbus 400 M, railway	yes
12	Ballistic Protection	STANAG 4569, AEP55, Vol.1, Level 3	yes
13	Blast Protection	STANAG 4569, AEP55, Vol.2, Level 3a / 3b	yes



Modularitu projektu ATV ZETOR GERLACH 4x4

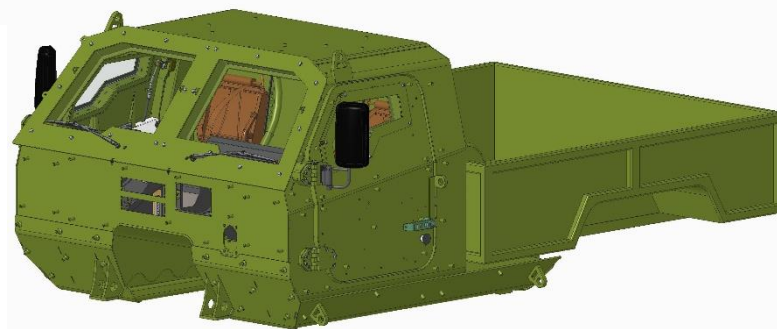
Otvorená ľahká kabína



Pancierová kabína+ kargo



Krátká pancierová kabína + ložná plocha



JEDNOTNÁ PLATFORMA



Porovnanie obsaditeľnosti vozidla

CV 90

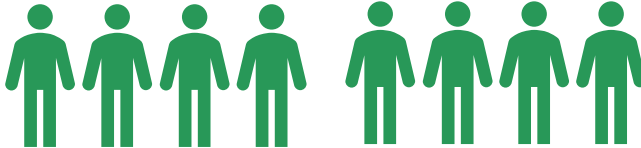


DRIVER, COMMANDER,
GUNNER



+

TROOPERS



TOTAL
CREW

11

PATRIA



DRIVER, COMMANDER,
GUNNER



+

TROOPERS



TOTAL
CREW

11

GERLACH



+

GERLACH



DRIVER,
COMMANDER
/GUNNER



+

TROOPERS



DRIVER,
COMMANDER
/GUNNER



+

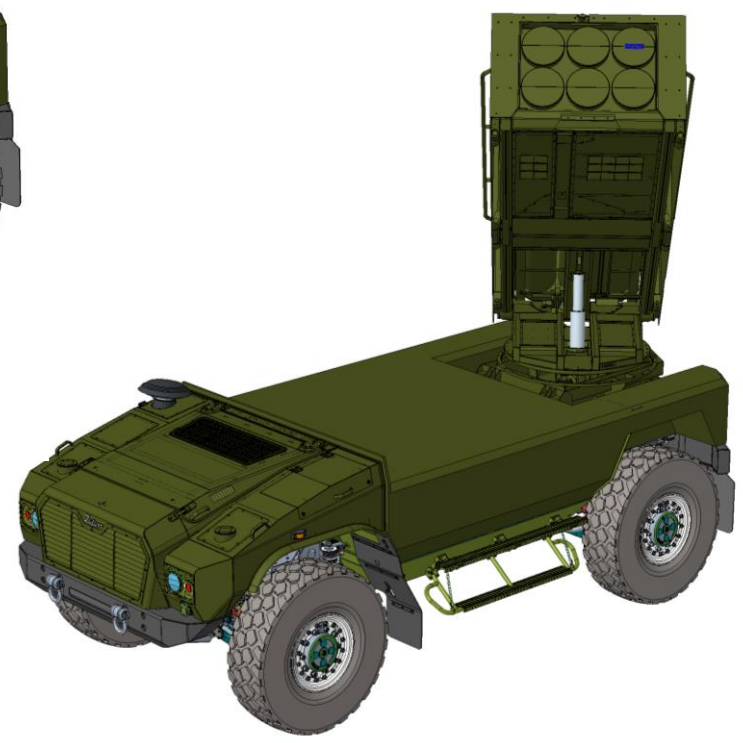
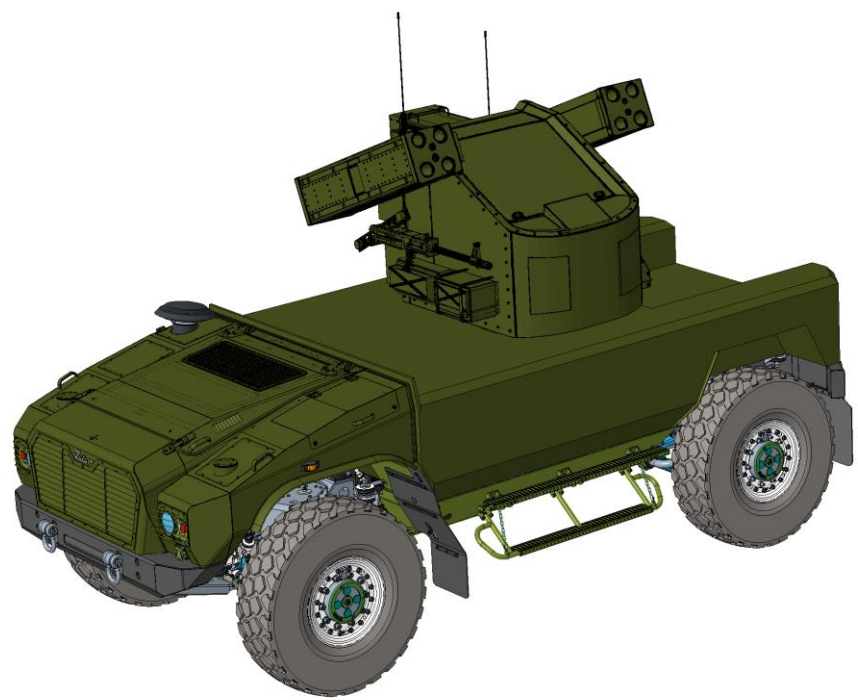
TROOPERS



TOTAL
CREW

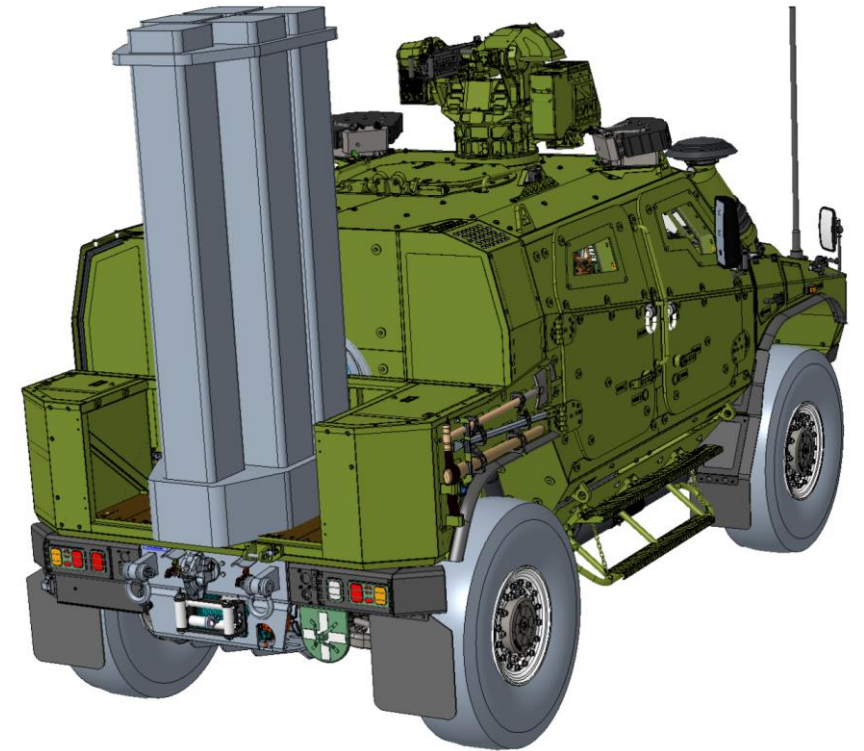
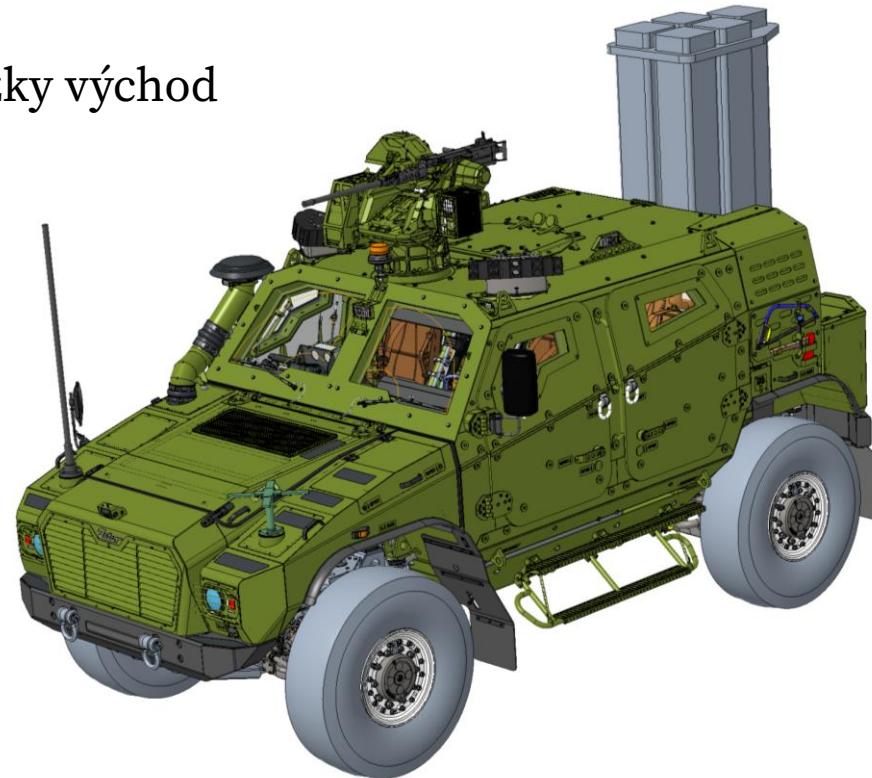
12

ZETOR GERLACH 4x4 – UGV



ZETOR GERLACH 4x4 – JQL Launchers

4 x Strela AGM-179A
M299 launcher
open-architecture Launcher Management
Assembly (LMA)
Lockheed Martin
Podpísané MOU pre Blízky východ



KONGSBERG – PROTECTOR RS4

Integrated Weapons:

Browning M2 (12,7) and 1x Javelin missile coaxially

M249 (5,56), M240, M134 Getling (7,62), Mk19, Mk 47 and H&K GMG (40 mm grenade launcher) coax kit or various ATGM integration



RWS PROTECTOR RS4



PROTECTOR



KONGSBERG REMOTE WEAPON SYSTEMS

PROTECTOR RS4

TECHNICAL DATA

Technical Specifications (Depending on variant)	Weight excl. Weapon & Ammunition: 135-190kg Height excl. Weapon & Ammunition: 505-765 mm
Cameras / Sensors:	Flexibility to meet customers day, night and LRF requirements
Dynamic Capabilities	Azimuth 360° unlimited range, 90° /s Elevation -20° to + 60°, 70° /s
Integrated Weapons	Browning M2 and WKM-B (12.7 mm), M249 (5.56 mm), M240, UKM-2000C and M134 Gatling (7.62 mm), MK19, MK47 and H&K GMG (40 mm grenade launchers with airburst option), various Non-Lethal effectors. The RS4 allows for M240 (6.62 mm) coax kit or various ATGM integrations.

FN Herstal - deFNder

Integrated Weapons:

FN M2HB – QCB (12,7)

MF MAG (7,62)

FN M3R



EVPU - GLADIUS

Integrated Weapons:

FN M2HB – QCB (12,7)

NSV (12,7)



MORTAR M12

Technical data:

Total Weight with trailer:	650 kg
Length of carriage:	3,7 m
Calibre:	120 mm
Effective firing range:	9,1 km



HOWITZER D30

Technical data:

Combat Weight: 3 200 kg
Transport Length: 5,4 m
Shell: 120 x 447 mm
Effective firing range: 15,4 km



UGV S-1 BUG

Technical data:

Operating weight	170 kg
Payload capacity	up to 200 kg
Max. speed on paved road	10 km /h
Climbing	30° (empty)
Side slope	60° (empty)
Vertical Step	0,3 m
Trench	0,5 m
Range (RLOS)	up to 1000 m
Endurance	2-3 hrs.
Protection	min. IP 54



Questions



Thank you for attention

