

## 7. APLICACIONES PARA EL MINISTERIO DE DEFENSA.



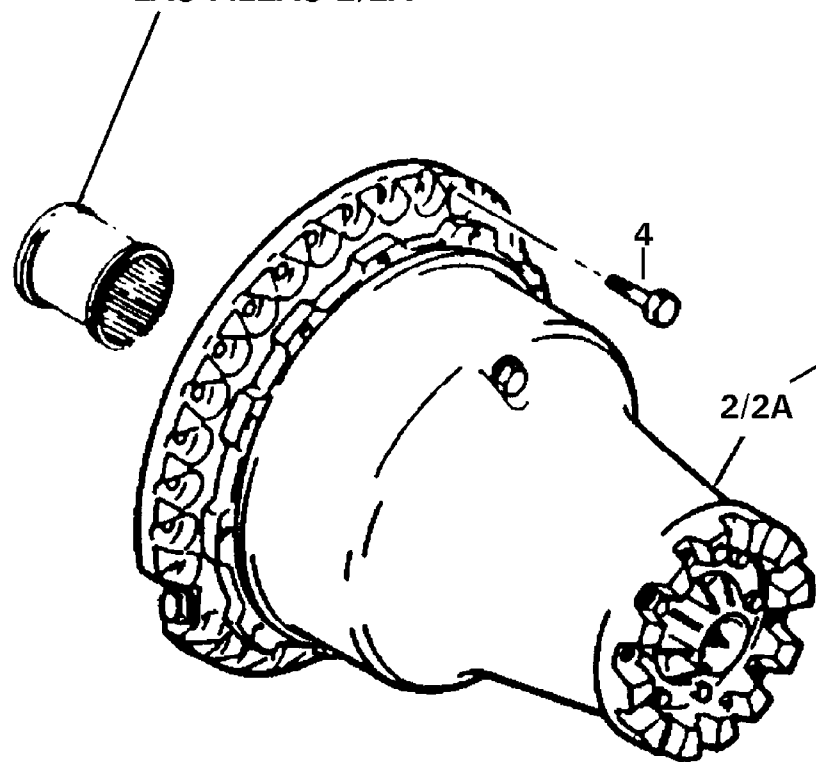
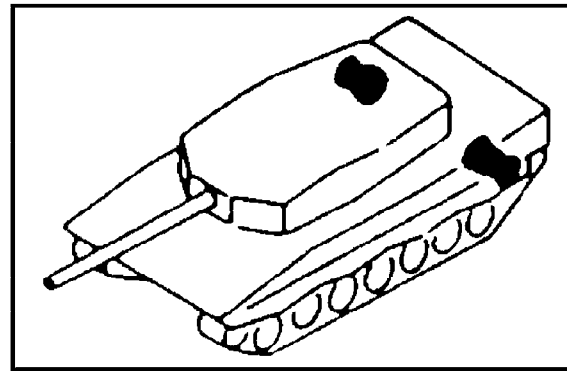


CARRO DE COMBATE LEOPARD 2A4  
EQUIPADO CON

TRANSMISION MECANICA – PASO FINAL



**NOTA:**  
EL MANGUITO DESLIZANTE DE LA FIG. 219  
NO PERTENECE A LOS CONJUNTOS DE  
LAS PIEZAS 2/2A



DESPIECE VER FIG.209  
HASTA 218

2/2A

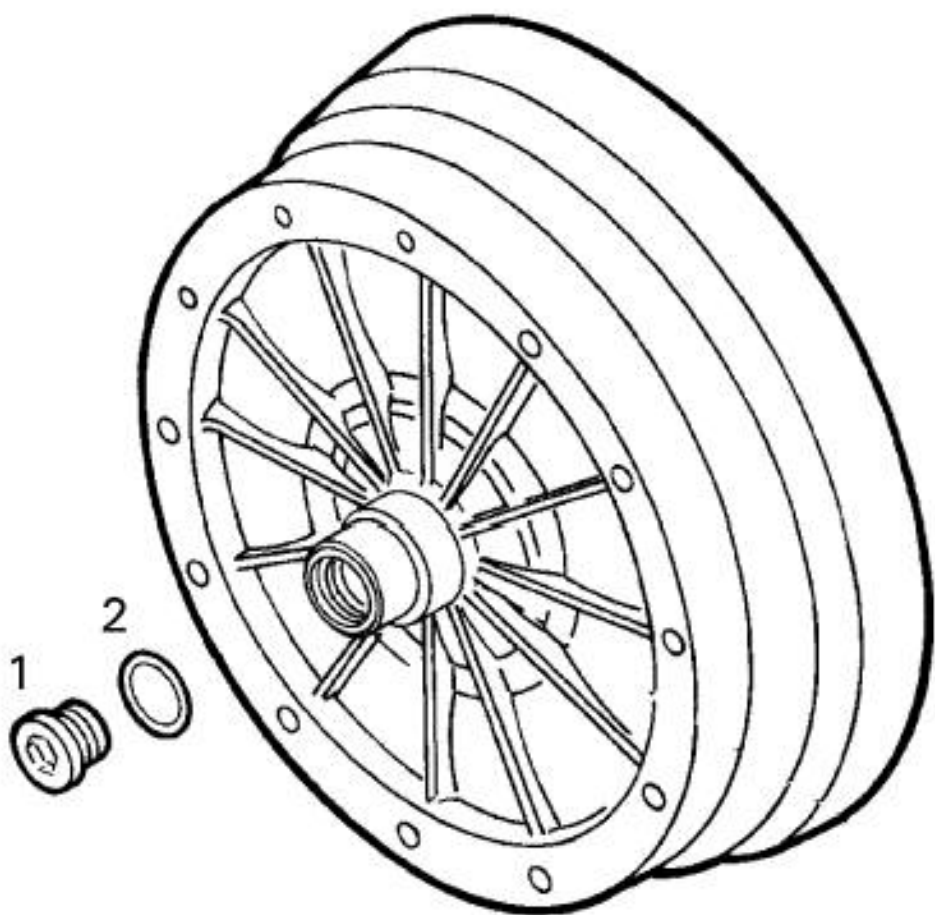
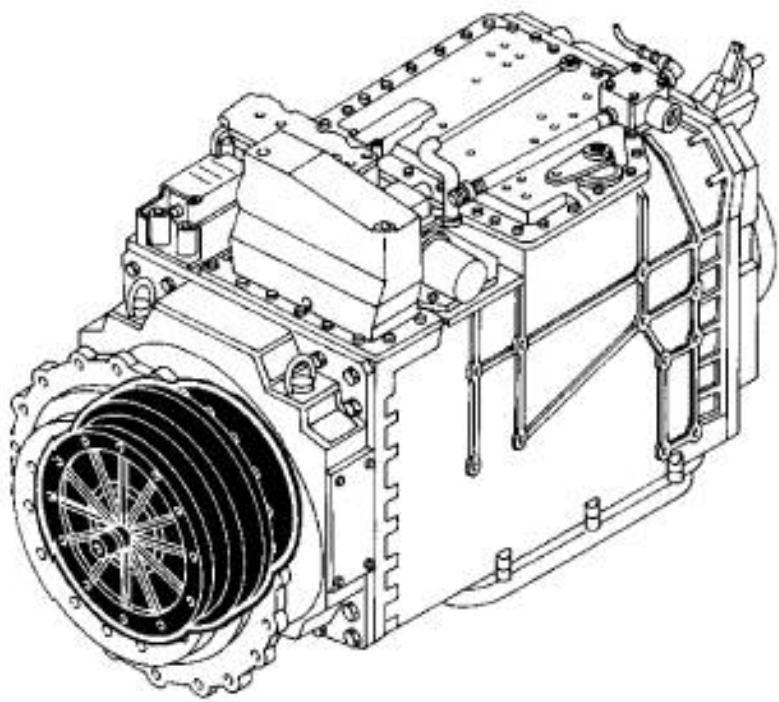
PIEZA 2/2A EMPAQUETADO  
EN CAJA ESPECIAL  
VER FIG. 532  
PIEZA 1

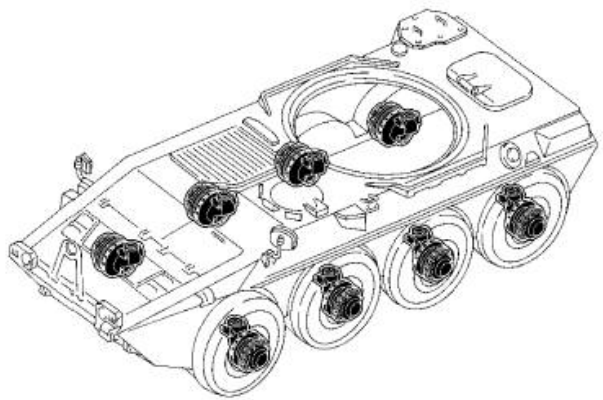


**VEHICULO DE RECONOCIMIENTO Y  
COMBATE VRC-105  
CENTAURO**

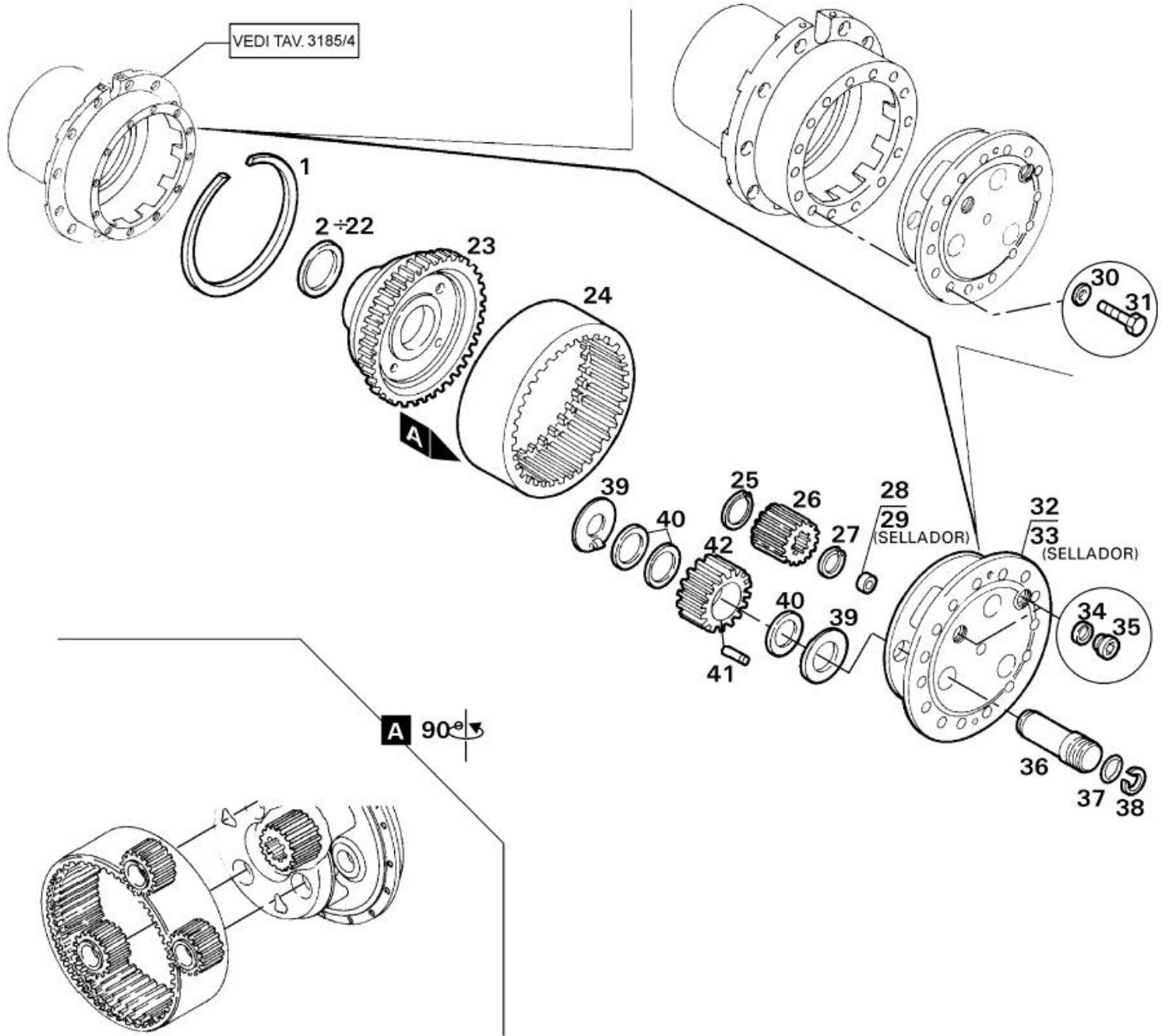
**EQUIPADO CON CAJA DE CAMBIOS,  
SERVODIRECCION, SISTEMA DE FRENOS Y  
TRANSMISION**



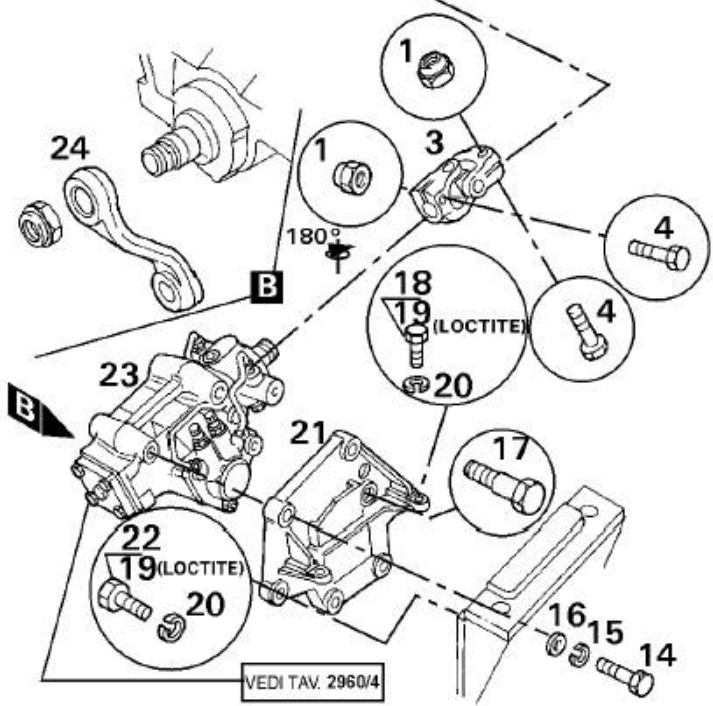
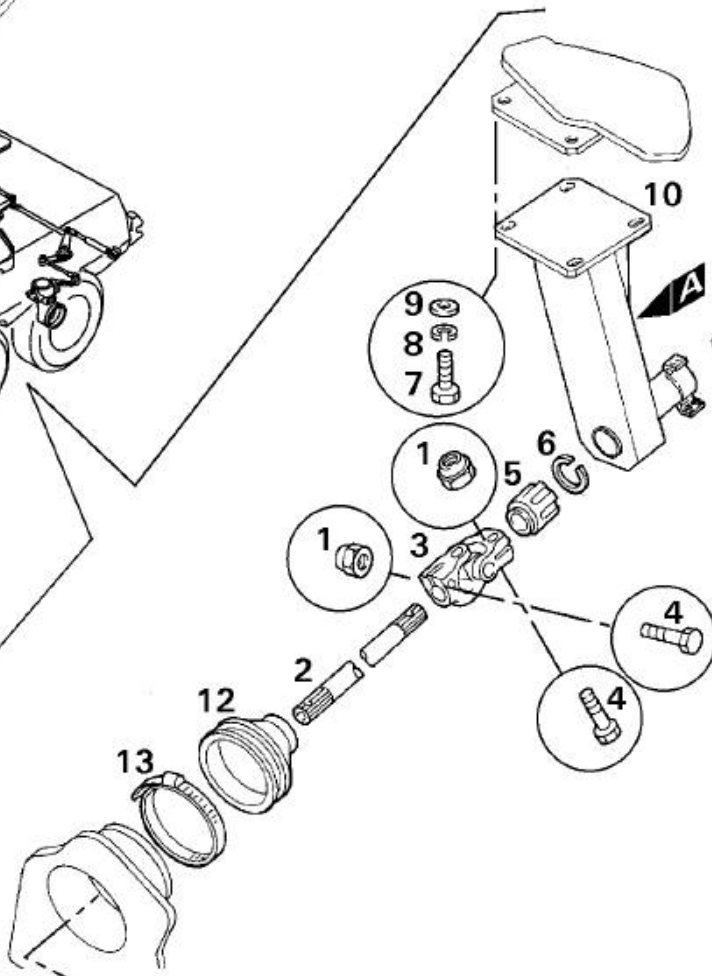
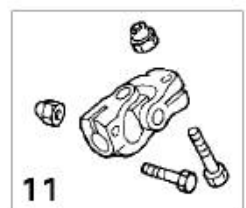
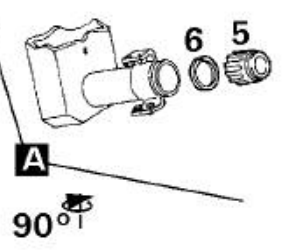
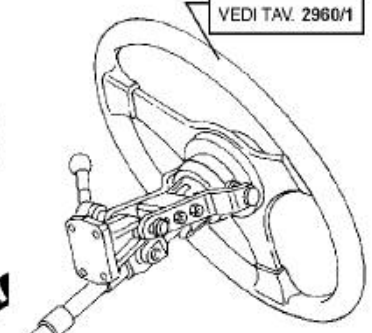
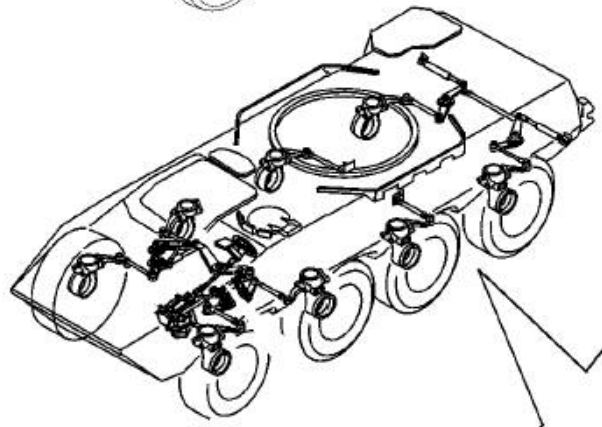
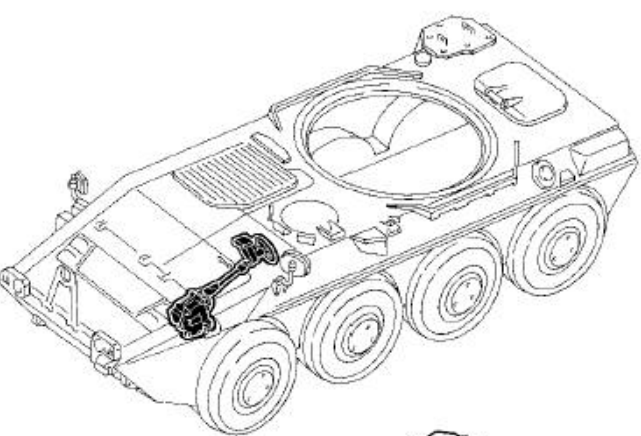




VEDI TAV. 3185/4



VEDI TAV. 2960/1



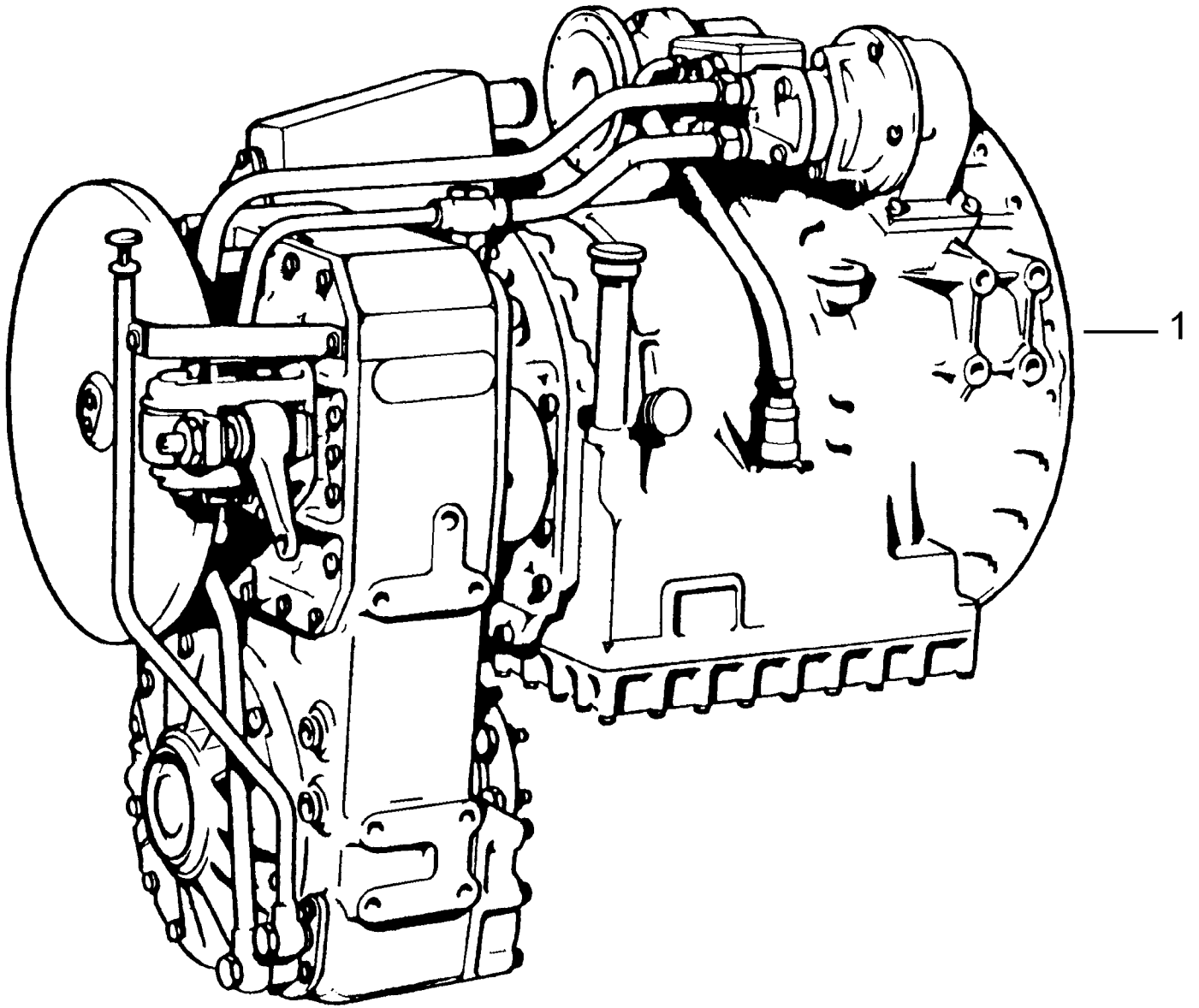
VEDI TAV. 2960/4



## **VEHICULO BMR/VEC**

**EQUIPADO CON CAJA DE CAMBIOS Y DIFERENCIAL  
AUTOBLOCANTE EN PUENTE ANTERIOR, CENTRAL Y  
POSTERIOR.**







## **VEHICULO DE COMBATE DE INFANTERIA PIRANHA**

**EQUIPADO CON  
CAJA DE CAMBIOS AUTOMATICA**

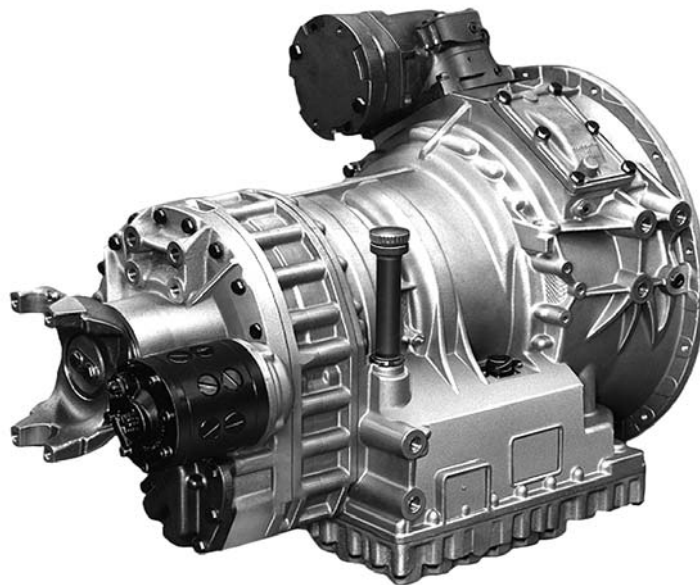


Ecomat

## Automatic powershift transmission for special vehicles

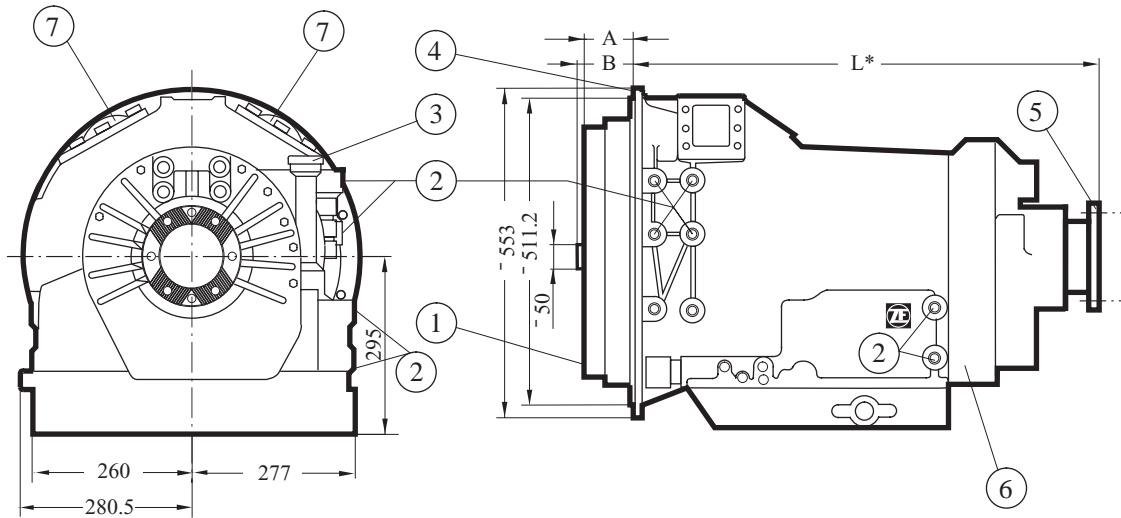
The versatile transmission is suitable for all special truck and special purpose vehicle applications. The product range is renowned for quality under the toughest application conditions. The new CAN-capable electronic shift modules provide the system with maximum possible shift comfort, safety, economy and service life.

- Smooth moving off even on the most difficult terrain, no clutch wear
- Shift points are loaded and acceleration-dependent
- Consistent level of shift comfort with pressure regulation during gear-shifts
- Improved safety due to integrated retarder with continuously variable control
- Fast, straightforward system diagnosis on vehicle with new diagnostic system with menu logic
- Best dimension-to-power ratio in its class
- Capability of cold start from  $-46^{\circ}\text{C}$  /  $-50,8^{\circ}\text{F}$  (winterized version)



Technical modifications remain reserved. For installation investigations and for appointments of the definitive implementation, we advise you to order corresponding installation drawings.

**ZF Friedrichshafen AG**  
D-88038 Friedrichshafen, Germany  
Fon +49 7541 77-3246 Fax +49 7541 77-903246  
[www.zf.com/special-transmission](http://www.zf.com/special-transmission)



Installation Drawing

Option	Unit	Type	Type	Type	Type	Type	Type	Type	Type	Type
		5 HP 502 S	6 HP 502 S	5 HP 602 S	6 HP 602 S	7 HP 602 S	5 HP 902 S	6 HP 902 S	7 HP 902 S	
A 70° Flansch:	W400	mm	693 - 779	693 - 779	693 - 779	693 - 779	795 - 881	693 - 802	795 - 904	795 - 904
A 70° Flansch: (2)	W400	mm		795 - 881	795 - 881	795 - 881				
B		mm	533	533	533	533	533	533	533	533

Technical Data

Option	Unit	Type	Type	Type	Type	Type	Type	Type	Type
		5 HP 502 S	6 HP 502 S	5 HP 602 S	6 HP 602 S	7 HP 602 S	5 HP 902 S	6 HP 902 S	7 HP 902 S
Input Torque	max. Nm	1.050	1.050	1.600	1.600	1.600	2.000	2.000	2.000
Number of Gears		5	6	5	6	7	5	6	7
Standard Ratio		3.43-0.83/4.84	3.43-0.59/4.84	3.43-0.83/4.84	3.43-0.59/4.84	5.6-0.59/4.84	5.6-1.0/4.84	5.6-0.83/4.84	5.6-0.59/4.84
Standard Ratio (2)			5.6-0.83/4.84	5.6-1.0/4.84	5.6-0.83/4.84				
Weight	kg	W390: 281	W390: 281	W390: 300	W390: 300	W390: 346	W390: 354	W390: 366	W390: 366
Weight (2)	kg		W390: 326	W390: 334	W390: 343				
Engine Connection		SAE 1	SAE 1	SAE 1	SAE 1	SAE 1	SAE 1	SAE 1	SAE 1
max. Numbers of PTO		2	2	2	2	2	2	2	2
PTO: max Output Torque	Nm	950	950	950	950	950	950	950	950

Technical modifications remain reserved. For installation investigations and for appointments of the definitive implementation, we advice you to order corresponding installation drawings.

**ZF Friedrichshafen AG**  
 D-88038 Friedrichshafen, Germany  
 Fon +49 7541 77-3246 Fax +49 7541 77-903246  
[www.zf.com/special-transmission](http://www.zf.com/special-transmission)



**VEHICULO RG31-MK5E**

**EQUIPADO CON**

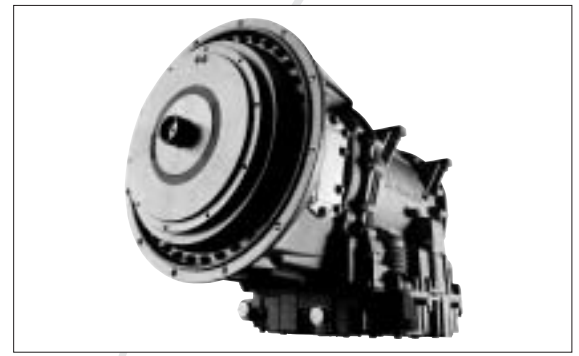
**CAJA DE CAMBIOS**



**Allison**  
**Transmission®**



## 3000/3200 Series



### RATINGS

Model <sup>(1)</sup>	Input Torque Gross N•m (lb-ft)	Input Power Gross <sup>(2)</sup> Kw (hp)	Turbine Torque Net <sup>(3)</sup> N•m (lb-ft)	GVW kg (lbs)	GCW kg (lbs)
3000 General	1261 (930)	254 (340)	2169 (1600)	n/a	n/a
	1186 (875)	239 (320)	2169 (1600)	28,500 (62,832)	n/a
	1424 (1050)	261 (350)	2305 (1700)	n/a	n/a
	1261 (930)	246 (330)	2169 (1600)	n/a	36,288 (80,000)
	1254 (925)	224 (300)	1857 (1370)	20,415 (45,000)	20,415 (45,000)
Ag Spreader, Sprayer, Blower, Feedlot Truck	1288 (950)	235 (315)	2169 (1600)	n/a	n/a
3000 SP Specialty / Military	1424 (1050)	261 (350)	2169 (1600)	n/a	n/a
3200 General	1491 (1100)	276 (370)	2169 (1600)	n/a	n/a
	1491 (1100)	276 (370)	2169 (1600)	28,500 (62,832)	n/a
	1695 (1250)	336 (450)	2305 (1700)	n/a	n/a
	1491 (1100)	276 (370)	2169 (1600)	n/a	36,288 (80,000)
	1695 (1250)	276 (370)	2305 (1700)	n/a	n/a
Ag Spreader, Sprayer, Blower, Feedlot Truck	1695 (1250)	276 (370)	2305 (1700)	n/a	n/a
3200 MH Motorhome	1695 (1250)	316 (425)	2305 (1700)	n/a	n/a
3200 ORS Articulated Dump	1100 (811)	224 (300)	2135 (1575)	44,500 (98,100)	n/a
	1100 (811)	224 (300)	2135 (1575)	44,500 (98,100)	n/a
Off-Road	<b>CONTACT YOUR ALLISON REPRESENTATIVE FOR DETAILS</b>				
3200 SP Specialty / Military	1695 (1250)	316 (425)	2305 (1700)	n/a	n/a

(1). Models including vocational designations (ie: ORS, OFS, SP, MH) are for global markets. All other models within this document are targeted for non North American markets only.  
 (2). Gross Power rating as defined by ISO 1585 or SAE J1995. (3). Turbine Torque limit based on ISCAAN standard deductions.

### DRIVETRAIN INTERFACES

Acceptable full-load engine governed speed	2000 – 2800 rpm
Acceptable engine idle speed range (with transmission in Drive)	500 – 860 rpm
Maximum output shaft speed at 105 km/hr (65 mi/hr) – retarder-equipped models only	3600 rpm

### MOUNTING

To Engine	SAE No.2
In Chassis	Rear support available (required for some installations)

### TORQUE CONVERTER

Type	One stage, three element, polyphase. Includes standard integral damper which is operational in lockup.
Model	Stall Torque Ratio
TC-411	2.71
TC-413	2.44
TC-415	2.35
TC-417	2.20
TC-418	1.98
TC-419	2.02
TC-421	1.77

### MECHANICAL RATIOS (Gear ratios do not include torque converter multiplication)

Range	
First	3.49 : 1
Second	1.86 : 1
Third	1.41 : 1
Fourth	1.00 : 1
Fifth	0.75 : 1
Sixth	0.65 : 1
Reverse	-5.03 : 1

## CONTROL SYSTEM

<b>Description</b>	Allison 4th Generation Electronic Controls with closed loop adaptive shifts
<b>Shift Sequences</b>	[C = Converter mode (lockup clutch disengaged); L = Lockup mode (lockup clutch engaged)] Option 1: 1C-[1L]-2C-2L-3L-4L Option 2: 1C-[1L]-2C-2L-3L-4L-5L Option 3: 1C-[1L]-2C-2L-3L-4L-5L-6L
<b>Driver-to-Transmission Interface</b>	Cab-mounted shift selector, pushbutton or lever with two-digit display (range selected and range attained)
<b>Communication Protocol - Engine/Vehicle Systems Interface</b>	SAE J1939, SAE J1587, ISO 9141, IESCAN

## PHYSICAL DESCRIPTION

	Length*	Dry weight	Depth below transmission centerline	
			With Shallow Oil Sump (Standard)	With Deep Oil Sump (Optional)
Basic Model	740 mm (29 in)	243 kg (535 lbs)	283 mm (11.5 in)	328 mm (12.9 in)
With PTO Drive Provision	846 mm (33.2 in)	260 kg (575 lbs)	283 mm (11.5 in)	328 mm (12.9 in)
With Retarder	740 mm (29 in)	280 kg (615 lbs)	283 mm (11.5 in)	328 mm (12.9 in)
With PTO Drive Provision and Retarder	846 mm (33.2 in)	300 kg (655 lbs)	283 mm (11.5 in)	328 mm (12.9 in)

\*Approximate length from engine housing to output flange (depending on output flange type)

## ENGINE-DRIVEN POWER TAKE-OFF PROVISION

Mounting pad positions viewed from rear	Drive gear rating with one PTO N•m (lb-ft)	Drive gear rating with two PTOs N•m (lb-ft)	PTO Drive Gear	Drive
4 o'clock and 8 o'clock (Standard)	660 (485)	930 (685)	68 tooth	Engine
1 o'clock and 8 o'clock (Optional)	660 (485)	930 (685)	83 tooth	Engine
Fire and Emergency	910 (670)	930 (685) <sup>1</sup>		

<sup>1</sup> Intermittent rating to 1068 N•m

## OUTPUT RETARDER PROVISION (OPTION)

Type	Integral, hydraulic		
	Capacity		
	Torque	Power	
Level 3	2170 N•m (1600 lb-ft)	447 kW (600 hp)	
Level 2	1760 N•m (1300 lb-ft)	373 kW (500 hp)	
Level 1	1490 N•m (1100 lb-ft)	298 kW (400 hp)	

## OIL SYSTEM

Allison approved fluids: TES 295, TES 389 and DEXRON®-VI	
Capacity, excluding external circuits	
With Deep Oil Sump	27 litres (29 quarts)
With Shallow Oil Sump	25 litres (26 quarts)
Main circuit oil filter	Replaceable element, integral
Cooler circuit oil filter	Replaceable element, integral
Electronic oil level sensor (OLS)	Standard

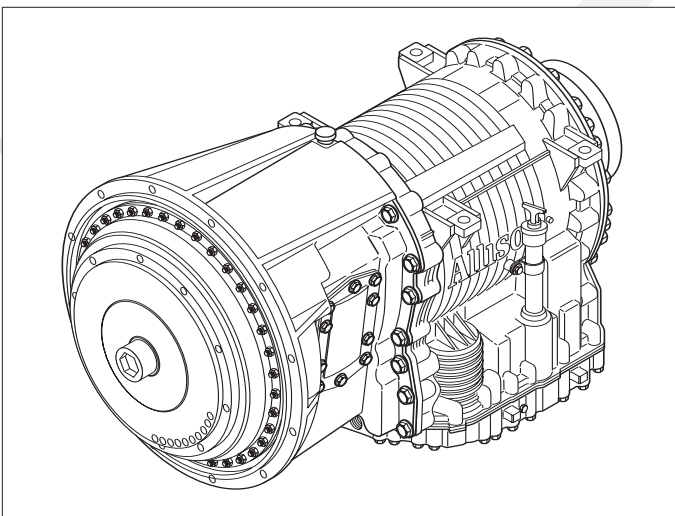
## SPEEDOMETER PROVISION

<b>Description</b>	Non-zero-crossing square wave
	8, 16 or 40 pulses per revolution of transmission output shaft
<b>Location</b>	Electronic output from TCM

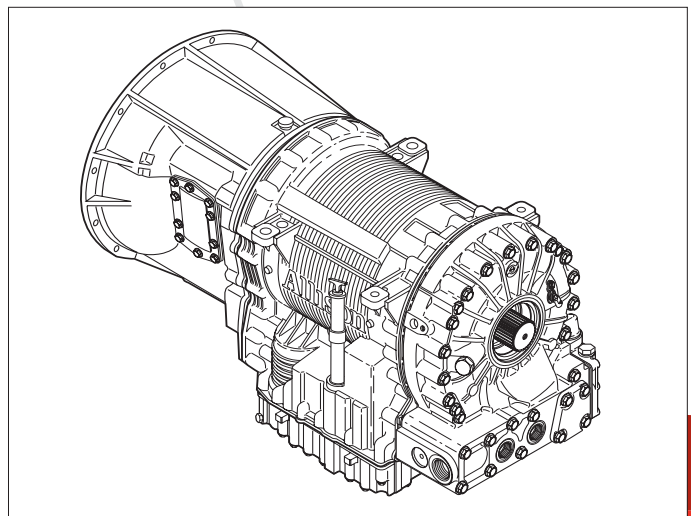
## TACHOGRAPH PROVISION

<b>Tone wheel</b>	4 or 6-tooth
<b>Mounting</b>	M18 x 1.5 metric thread
<b>Location</b>	Transmission rear cover or retarder housing

### 3000/3200 Series With Shallow Sump and PTO



### 3000/3200 Series With Retarder, PTO and Deep Oil Sump





CAMIONES TODO TERRENO

EQUIPADOS CON CAJAS DE CAMBIOS MANUALES



Y CAJAS DE CAMBIOS AUTOMATICAS





**VEHICULOS URO**  
EQUIPADOS CON  
CAJA DE CAMBIOS AUTOMATICA



**Allison**  
**Transmission®**

