

Transmission—Group 26

Gear Ratio and Number of Teeth

	Gear ratio	Number of teeth
1 st gear	1 : 4.05	13/28
2 nd gear	1 : 2.38	19/24
3 rd gear	1 : 1.53	27/22
4 th gear	1 : 1	—
Reverse gear	1 : 3.92	12/17/25
Constant (drive shaft: countershaft)	1 : 1.88	17/32

Backlash

1 st gear	0.10 — 0.16
2 nd gear	0.10 — 0.16
3 rd gear	0.06 — 0.12
Reverse gear	0.10 — 0.20
Constant (drive shaft: countershaft)	0.06 — 0.12

Bearing Surfaces and Clearances of Main Shaft and Gears

	Diameter main shaft		Bore gear		Radial play		End play
1 st gear	$\frac{35.000}{34.987}$		$\frac{42.018}{42.033}$		0.030 — 0.045		0.10 — 0.18
2 nd gear	$\frac{35.000}{34.987}$		$\frac{42.018}{42.033}$		0.030 — 0.045		0.10 — 0.18
3 rd gear	Plain bearing	Roller bearing	Plain bearing	Roller bearing	Plain bearing	Roller bearing	0.10 — 0.18
	$\frac{37.955}{37.946}$	$\frac{35.000}{34.987}$	$\frac{38.000}{38.016}$	$\frac{40.030}{40.005}$	0.045 — 0.070	0.030 — 0.058	

Longitudinal play of key	minimum 0.1
--------------------------	-------------

Bearing Surfaces of Countershaft and Counter Gears

	Diameter Countershaft	Bore Counter Gear
for counter gear 3 rd speed	$\frac{35.033}{35.017}$	$\frac{35.000}{35.025}$
for counter gear 4 th speed	$\frac{35.033}{35.017}$	$\frac{34.994}{35.010}$

Permissible eccentricity	of main shaft and countershaft 0.02
--------------------------	-------------------------------------

Reverse Gear and Shaft

Bore of bushing	Diameter of reverse gear shaft	Radial play	Force-fit dimension of bushing in gear
$\frac{20.065}{20.098}$	$\frac{20.000}{19.987}$	0.065—0.111	+ 0.01 to + 0.03 Ends expanded at 45° bushing must withstand an axial thrust of 15000 kg

Annular Grooved Bearing and Cylindrical Rollers

Designation	Location	Radial play	End play	Bore inner race	Diameter outer race	Width
Annular grooved bearing 6305 C3 DIN 625	Countershaft	0.017—0.032	0.17—0.32	25	62	17
Annular grooved bearing 6306 N DIN 625	Main shaft *	0.008—0.022	0.10—0.20	30	72	19
Annular grooved bearing 6306 ZN DIN 625 (ZN with cover plate)	Drive shaft					
Roller cage 2x18 cylindrical rollers 3.5 x 8 DIN 5402 120 981 03 12	1st speed gear	0.030—0.045	minimum 0.10	Shaft diameter	Bore speed gear	21.4
Split roller cage 2x18 cylindrical rollers 3.5 x 8 DIN 5402 120 981 03 12	2nd speed gear			35	42	
2 Roller cages 2x28 cylindrical rollers 2.5x11.8 DIN 617 000 981 28 12	3rd speed gear**	0.030—0.058	minimum 0.20	35	40	15.5

* On the main shaft, only bearings marked X may be installed
(X = maximum rounding radius 2 mm)

** In the 1st version, the gear is supported on a plain bearing

Shaft Diameter for Ball Bearing Seat

Drive shaft	Main shaft	Countershaft
$\frac{30.009}{29.996}$	$\frac{29.996}{29.991}$	$\frac{25.000}{24.996}$

Clearance between Annular Grooved Bearings and Front and Rear Transmission Covers

Drive shaft and main shaft	0.00—0.05	Countershaft	only at rear transmission cover 0.15—0.20
----------------------------	-----------	--------------	--

Synchronizing Rings

Nose width	1st gear 10 mm	2nd, 3rd, and 4th gear 8.4 mm
Minimum distance between the short teeth of synchronizing ring and of the speed gear		0.5 mm

Sliding Sleeve

Thrust when sliding sleeve is disengaged	7—11 kg
Play of sliding sleeve until contact is established with 1st — 4th speed cone	0.8—1.3

Transmission Cover

Clearance between spacer tube or spacer rings and transmission cover in shift position	0.10—0.15
--	-----------

Spring Testing Table

	External diameter mm	Wire gage mm	Free length mm	Length under load		Load tolerance %
				mm	kg	
Pressure springs 120 993 14 01	6	0.75	12.4	a) 8.2 b) 7.3	1.65 2.00	± 5
Pressure springs for shift forks, 1st and 2nd gear, 3rd and 4th gear 186 993 13 01	7.6	1.1	20.2	a) 15.5 b) 13.0	3.2 5.0	± 8
Pressure springs for reverse gear shift shoe 136 993 31 01	7.8	1.4	20.25	a) 15.5 b) 13.0	9.8 15.0	± 8

a) installed b) under final load

Shaft Diameters for Sealing Rings

	new	Repair stage	Thread
Drive shaft	$\frac{29.900}{29.848}$	down to 29.700	turn a left-hand thread-pattern after refinishing
Three-way flange on main shaft	$\frac{38.000}{37.840}$	37.340	turn a right-hand thread-pattern after refinishing

Permissible run-out of three-way flange at outside diameter	0.10
The three-way flange can be turned down to a minimum thickness of 8.5 mm	

Torque Readings

Front main shaft grooved nut	12 mkg
Rear main shaft grooved nut for attaching the three-way flange	14—15 mkg