

COMPACT DESIGN:

- No external hoses
- Best power to weight ratio
- Designed especially for material handling applications

NOISE REDUCTION:

Optimized noise level through high contact helical gears, and thus consistent in quality and extremely quiet.

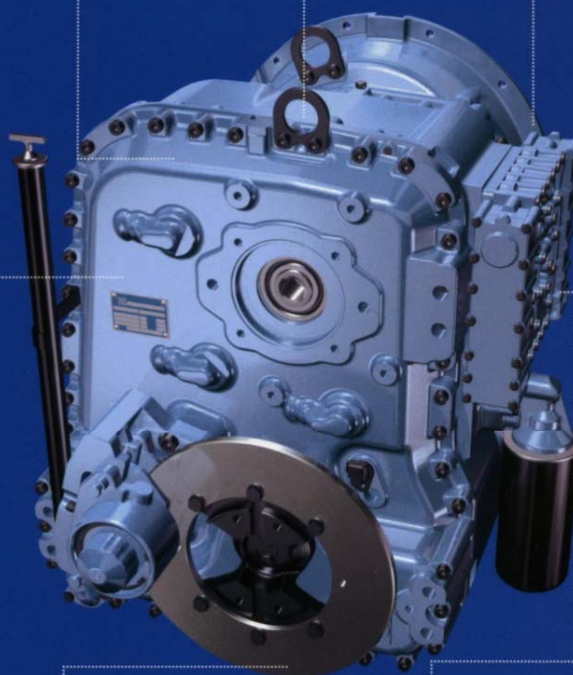
SERVICEABILITY:

- Customer oriented serviceability allows easy maintenance and repair
- Logistic advantages, more common parts

SOPHISTICATED HYDRAULIC AND ELECTRONIC PACKAGE:

Several programs in one control unit available

3



PARKING BRAKE:
Parking brake available (SAHR – Spring Applied, Hydraulic Released)

PROPORTIONAL VALVE BLOCK:

- Easy handling for the driver (fully automatic – advanced shifting strategy)
- Adaption of shift parameter to compensate influence of transmission oil
- Shift quality know-how from ZF passenger car automatic

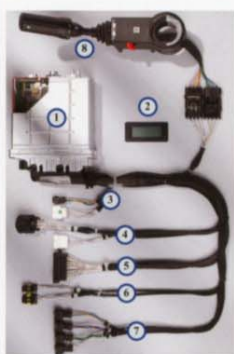


ZF-Driveline Systems for Lift-Trucks

4

Take control with electronic inching

ZF powershift transmission series feature electronic inching that makes it easier for the lift-truck driver to position loads with a high degree of precision.



Easy handling of heavy loads with ZF ERGOCONTROL and inching sensor.

- 1 Electronic control unit
- 2 Display
- 3 CAN interface and diagnostic interface
- 4 Transmission hydraulic plug and display plug
- 5 Vehicle interface
- 6 Filter restriction switch and sensor technology for output speed
- 7 Sensors for turbin, internal and engine speed and optional temp. connector
- 8 Gear selector

- Optimum control of gear changes by proportional valve technology with a high sophisticated software adapted from automotive standards
- Durable clutch packs with increased oil flow
- Unlimited inching in all gears
- Simple calibration of inching pedal



ZF-POWERSHIFT WG 92-98 / ZF-ERGOPOWER WG 116-171

CVS Daewoo Douglas Fantuzzi Ferrari-Belotti
FMC-Technologies Hyundai Indital Kalmar Fin Kalmar S
Luna Madal Mafi Milan Mol Nacco Noell
Pyke Schopf Stewart-Tuc Svetruck Taylor Terberg ZV

6

High precision with heavy loads

ZF transmissions WG 116-171
are developed especially for different
applications with combustion engines.



Model: WG 116-171

A very compact design and ease of use during driving and operation are decisive advantages for vehicles equipped with this transmission series.

- Applications: Lift-trucks, RoRo-, Terminal- and Yard tractors
- For vehicles up to approximately 66 t gross vehicle weight (28 t lifting capacity)
- 3 forward and 3 reverse gears
- Various hydrodynamic torque converters
- Drop input/output 300 mm
- 1 PTO, co-axial*
- Proportional controlled powershift
- Full/semi-automatic gear shift control
- Electronic inching
- Integrated oil lines
- Optional parking brake type SAHR

* second PTO optional (additionally mounted box)



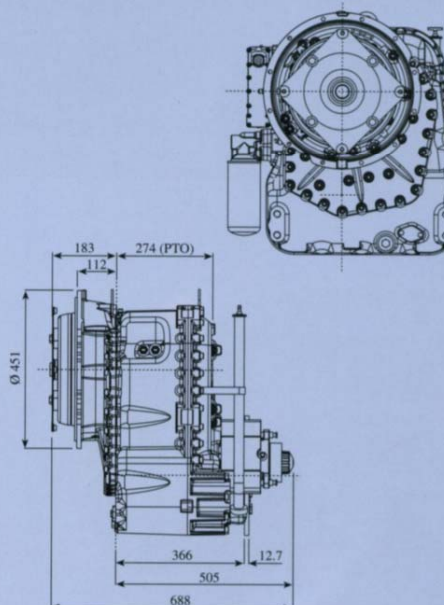
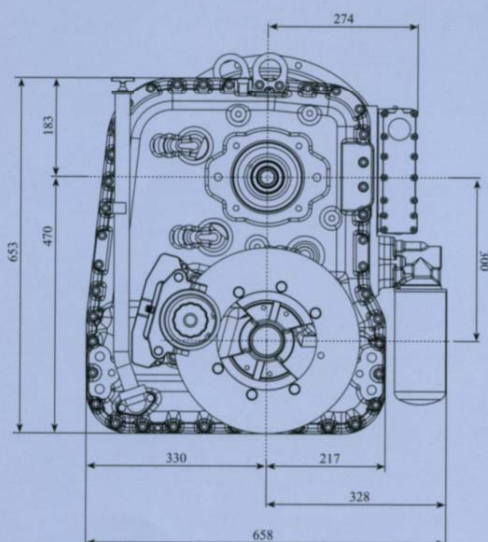
ZF-POWERSHIFT WG 92-98 / ZF-ERGOPOWER WG 116-171

	WG 92	WG 98	WG 116	WG 131	WG 161	WG 171
■ GROSS VEHICLE WEIGHT max. t	8	12	23	36	44	66
■ LIFTING CAPACITY max. t	3	5	9	14	20	28
■ ENGINE POWER max. kW	65	75	90	130	160	175
■ ENGINE SPEED max. rpm	2600	2600	2600	2600	2600	2600
■ TURBINE TORQUE max. Nm	500	650	800	950	1100	1300
■ STALL TORQUE RATIO	1.5 to 3.0	1.5 to 3.0	1.7 to 2.5	1.7 to 2.5	1.7 to 2.5	1.7 to 2.5
■ PTO max. Nm	400	400	800	800	800	800
■ WEIGHT (WITHOUT OIL) appr. kg	220	220	300	300	300	300
■ NUMBER OF GEARS	2/2*	2/2*	3/3	3/3	3/3	3/3

* 3/3, 4/3 possible

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WG 116-171



Subject to technical modifications.
For installation investigation purposes
and in order to ascertain final version,
please request relevant installation
drawings.





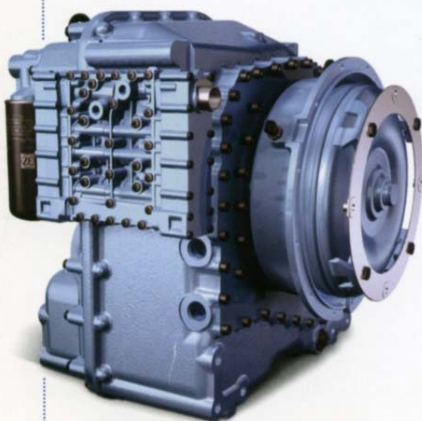
ZF-ERGOPOWER WG 191-211

CVS Daewoo Douglas Fantuzzi Ferrari-Belotti
Luna FMC-Technologies Hyundai Indital Kalmar Fin Kalmar S
Pyke Madal Mafi Milan Mol Nacco Noell
Schopf Stewart-Tuc Svetruck Taylor Terberg ZV

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Compact design with maximum power

ZF transmissions of the Ergopower WG 191-211 series are highly powerful and suited to installation in a wide range of material handling equipment.

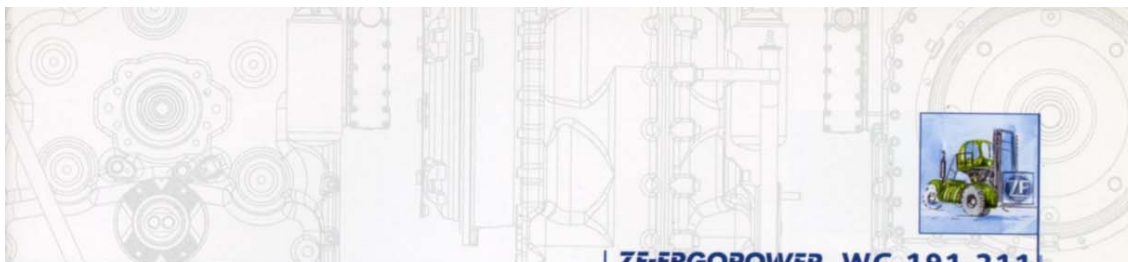


Model: WG 211

Ergopower transmissions WG 191-211 series are optimized in weight and size, but nevertheless they offer maximum power.

- Applications: RoRo-, Terminal- and Yard tractors, Lift-trucks
- For vehicles up to approximately 98 t gross vehicle weight (36 t lifting capacity)
- 3-6 forward and 3 reverse gears
- Various hydrodynamic torque converters, lock-up clutch available
- Drop input/output 190 mm
- 1 PTO, co-axial*
- Proportional controlled powershift
- Full/semi-automatic gear shift control
- Electronic inching
- Integrated oil lines

* second PTO optional (additionally mounted box)



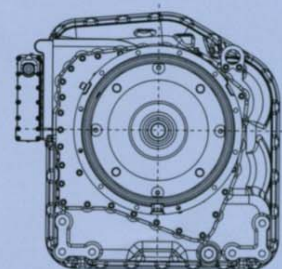
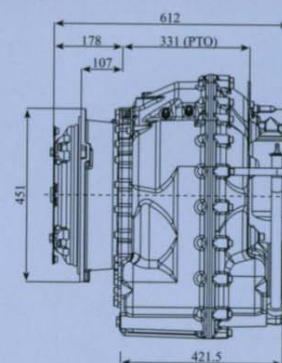
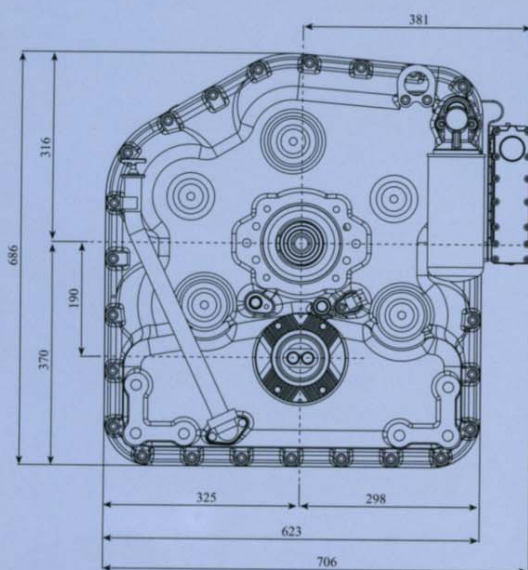
ZF-ERGOPOWER WG 191-211

ZF-ERGOPOWER

		WG 191	WG 211
■ GROSS VEHICLE WEIGHT	max. t	80	98
■ LIFTING CAPACITY	max. t	32	36
■ ENGINE POWER	max. kW	190	230
■ ENGINE SPEED	max. rpm	2600	2600
■ TURBINE TORQUE	max. Nm	1500	1700
■ STALL TORQUE RATIO		1.5 to 2.5	1.5 to 2.5
■ PTO	max. Nm	800	800
■ NUMBER OF GEARS		3/4/6	3/4/6

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WG 191-211



Subject to technical modifications.
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drawings.





ZF-ERGOPOWER WG 261-311

CVS Daewoo Douglas Fantuzzi Ferrari-Belotti
FMC-Technologies Hyundai Indital Kalmar Fin Kalmar S
Luna Madal Mafi Milan Mol Nacco Noell
Pyke Schopf Stewart-Tuc Svetruck Taylor Terberg ZV

10

High performance at low noise level

Ergopower transmissions WG 261-311
– reliability, operating comfort with
high power handling capability.



Model: WG 261

The powershift transmissions of the Ergopower WG 261-311 series fulfill the highest demands in lift-trucks, reach stacker and RoRo tractors.

- Applications: Lift-trucks, Reach stacker and RoRo tractors
- For vehicles up to approximately 140 t gross vehicle weight (55 t lifting capacity)
- 3-6 forward and 3 reverse gears
- Various hydrodynamic torque converters, lock-up clutch available
- Drop input/output 380 mm
- Max. 3 PTO possible: 1 coaxial PTO, 2 side PTO's
- Proportional controlled powershift
- Full/semi-automatic gear shift control
- Electronic inching

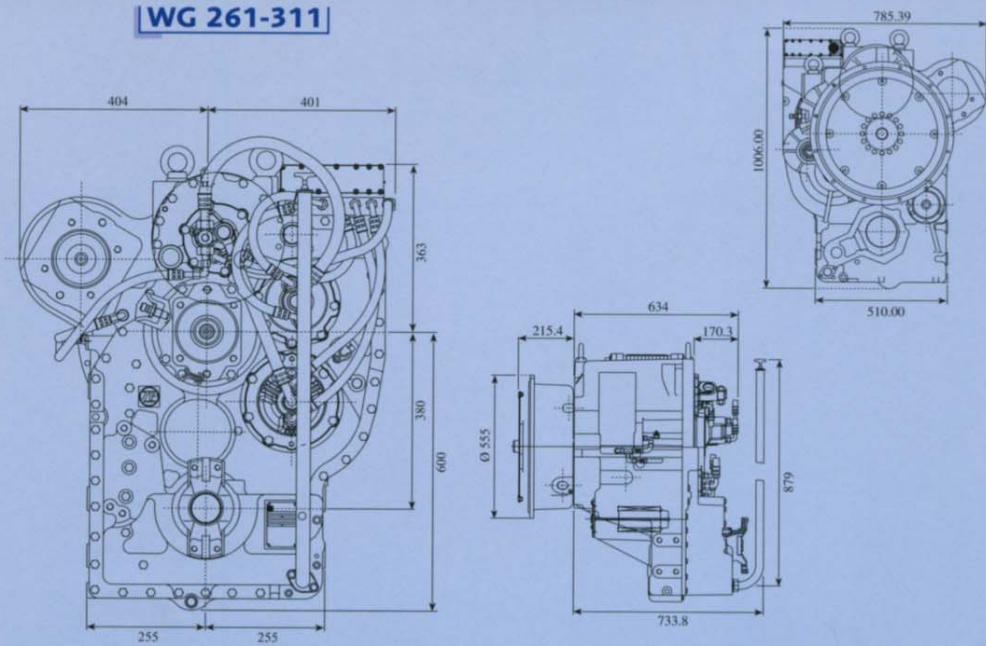


ZF-ERGOPOWER WG 261-311

ZF-ERGOPOWER		WG 261	WG 311
■ GROSS VEHICLE WEIGHT	max. t	120	140
■ LIFTING CAPACITY	max. t	45	55
■ ENGINE POWER	max. kW	270	320
■ ENGINE SPEED	max. rpm	2500	2500
■ TURBINE TORQUE	max. Nm	2500	2750
■ STALL TORQUE RATIO		1.5 to 2.5	1.5 to 2.5
■ PTO	max. Nm	1500	1500
■ WEIGHT (WITHOUT OIL)	appr. kg	740	740
■ NUMBER OF GEARS		3/4/6	3/4/6

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WG 261-311



Subject to technical modifications.
For installation investigation purposes
and in order to ascertain final version,
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drawings.





ZF-ERGOPOWER WG 115-310 long drop version

ZF-ERGOPOWER		WG 115	WG 130	WG 160	WG 190	WG 210	WG 260	WG 310
■ ENGINE POWER	max. kW	90	130	160	190	230	270	320
■ ENGINE SPEED	max. rpm	2600	2600	2600	2600	2600	2500	2500
■ TURBINE TORQUE	max. Nm	750	900	1100	1500	1700	2500	2750
■ STALL TORQUE RATIO		1.5 to 3.0	1.5 to 3.0	1.5 to 3.0	1.5 to 3.0	1.5 to 3.0	1.5 to 3.0	1.5 to 3.0
■ DROP DISTANCE	mm	500	500	500	540	540	575	575
■ PTO	max. Nm	800	800	800	800	800	1500	1500
■ WEIGHT (WITHOUT OIL)	appr. kg	360	360	360	480	480	780	780
■ NUMBER OF GEARS		3/4/6	3/4/6	3/4/6	3/4/6	3/4/6	3/4/6	3/4/6



- low operating costs
- high flexibility
- improved shift quality
- reduced noise
- ease of maintenance
- high driving comfort

Model: WG 210

A very compact design and ease of use during driving and operation are decisive advantages with this transmission range.

