

$$p = 100 \cdot \left[\frac{F_z}{9,81 \cdot G_z} - f_R \right]$$

$$F_z = \frac{2\pi \cdot M_{Mot} \cdot \eta \cdot l_g \cdot l_v}{U}$$

$$F_z = \frac{2 \cdot 3,14 \cdot 1850 \cdot 0,85}{3,1}$$

$$F_z = 205526 \text{ N} \approx 205,5 \text{ kN}$$

$$c = \sqrt{l^2 + h^2} = l \cdot \sqrt{1 + \left(\frac{p}{100}\right)^2}$$

MAN Guidelines to Fitting Bodies Truck

PTO Variants for MAN Gearboxes Edition 09/2016

Engineering the Future - since 1758

MAN Truck & Bus AG



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**This English version is a translation.
In case of doubt or conflict the valid German language original will govern.**

We reserve the right to make technical modifications in the course of further development.

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1. General information

Kindly note that the PTO variants described in the tables may not all be available ex works. The PTOs that can be supplied as standard are contained in our currently applicable sales documents.

2. Duration of operation and power flow

All MAN PTOs are basically designed for continuous operation.
Currently, only clutch-dependent PTOs for MAN TipMatic gearboxes are offered.

3. Type of PTO

The last digit of the PTO designation, i.e. the letter “P” or “F”, defines the type of output.

One must distinguish between:

- Version “F”: basic version for driving a cardan shaft
- Version “P”: for directly attaching pumps

4. Permissible weight balance at PTO

If pumps are attached directly (Version “P”), the body manufacturer must ensure that the maximum permissible weight balance of a directly attached pump with attachments (e.g. hoses) is not exceeded.

The weight balance must not exceed 50 Nm; at the same time, the pump must not be heavier than 30 kg.

5. PTO and intarder

The optional attachment of an intarder to the MAN TipMatic gearbox does not affect the attachment location of the PTO.

6. Overview of PTOs for the gearboxes

The following tables list all the PTOs available for the specific gearbox types. Not every combination of chassis, gearbox and PTO is possible.

Information on prohibited combinations for certain vehicles can be obtained from:

- The local branch or dealer

Only a written reply to a written request is binding. In the tables, the technical data of the PTOs is shown with reference to each specific gearbox.

This data includes:

- Direction of rotation (left = anti-clockwise; right = clockwise)
- DN factor f (x the engine speed results in the speed at the PTO); depending on the parametrisation of the gearbox, two different DN factors are possible (“L” or “I” for slow and “S” or “II” for fast). The slow DN factor is always set as the default by the factory.
- Permissible torque of 1,500 rpm at the PTO
- Flange diameter
- Attachment position
- Installation position in relation to the adapter shaft and the main shaft with x, y and z coordinates

7. Technical data and tables

The x coordinates of the gearbox and PTO

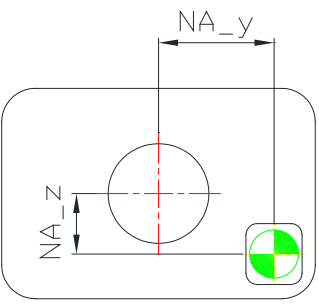
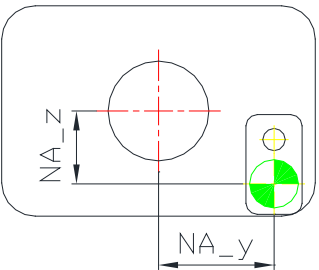
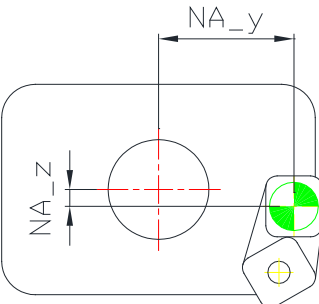
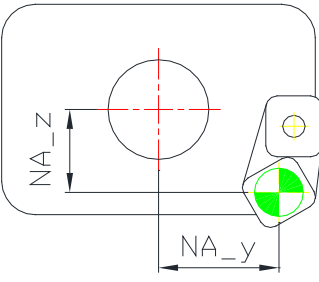
PTO at the gearbox end



Vorg_x: Distance from the motor flange surface to the attachment surface on the gearbox for the PTO.

NA_x: Distance from the attachment surface on the gearbox for the PTO to the rear edge of the PTO.

The y and z coordinates of the gearbox and PTO

<p>Bild 1 MAN 650P/660F/651P/661F MAN 652P/662F/653P/663F</p>	
<p>Bild 2 MAN 640P/640F MAN 641P/641F</p>	
<p>Bild 3 MAN 670P/672P oben</p>	
<p>Bild 4 MAN 670F/672F unten</p>	

NA_y: Lateral off-set from the centre of the main output flange to the centre of the PTO
(+: to the right of the centre of the countershaft; -: left)

NA_z: Height off-set from the centre of the main output flange to the centre of the PTO
(+: above the centre of the countershaft; -: below)

MAN TipMatic DD

PTOs for gearboxes: 12+2 GZ 2700 DD (standard) 16.41 – 1

12+2 GZ 2700 DD (with retarder 3500) 16.41 – 1

12+2 GZ 2700 DD (with retarder 4100 and uncoupling) 16.41 – 1

Attachment surface: On the right of the gearbox end, looking at the main output flange

Vorg_x [mm]: 871 Gearbox flange Ø [mm]: 180.00

Designation	Direct. of rotation	DN factor f		Torque [Nm]	Output* [kW]	Flange Ø [mm]	Install position	Fig.	NA_x [mm]	NA_y [mm]	NA_z [mm]
		K1	K2								
MAN 650P	left	1.00	1.24	1,200	74/110		Central	1	90.00	160.00	160.00
MAN 660F	left	1.00	1.24	1,200	74/110	100.00	Central	1	147.00	160.00	160.00
MAN 651P	left	1.28	1.58	700	74/110		Central	1	90.00	160.00	160.00
MAN 661F	left	1.28	1.58	700	74/110	100.00	Central	1	147.00	160.00	160.00
MAN 640P	right	1.65	2.04	430	70/100		Bottom	2	140.00	160.00	-240.00
MAN 640F	right	1.65	2.04	430	70/100	100.00	Bottom	2	181.00	160.00	-240.00
MAN 670PF	right	1.21	1.49	800	110		Top	3	181.00	238.00	-108.00
MAN 670PF	right	1.61	1.99	500		100.00	Bottom	4	274.00	205.00	-231.00

* The higher value of the power output is only valid for short-term operation (max. 15 minutes) or with an additional heat exchanger.

MAN TipMatic OD

PTOs for gearboxes: 12+2 GZ 3000 OD (standard) 13.28 – 0.8

12+2 GZ 3000 OD (with retarder 3500) 13.28 – 0.8

12+2 GZ 3000 OD (with retarder 4100 and uncoupling) 13.28 – 0.8

Attachment surface: On the right of the gearbox end, looking at the main output flange

Vorg_x [mm]: 871 Gearbox flange Ø [mm]: 180.00

Designation	Direct. of rotation	DN factor f		Torque [Nm]	Output* [kW]	Flange Ø [mm]	Install position	Fig.	NA_x [mm]	NA_y [mm]	NA_z [mm]
		K1	K2								
MAN 652P	left	0.82	1.03	1,200	74/110		Central	1	90.00	160.00	160.00
MAN 662F	left	0.82	1.03	1,200	74/110	100.00	Central	1	147.00	160.00	160.00
MAN 653P	left	1.03	1.29	700	74/110		Central	1	90.00	160.00	160.00
MAN 663F	left	1.03	1.29	700	74/110	100.00	Central	1	147.00	160.00	160.00
MAN 641P	right	1.33	1.67	430	70/100		Bottom	2	140.00	160.00	-240.00
MAN 641F	right	1.33	1.67	430	70/100	100.00	Bottom	2	181.00	160.00	-240.00
MAN 672PF	right	1.25	1.56	600	110		Top	3	181.00	238.00	108.00
MAN 672PF	right	1.66	2.08	500		100.00	Bottom	4	274.00	205.00	-231.00

* The higher value of the power output is only valid for short-term operation (max. 15 minutes) or with an additional heat exchanger.

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