

## 1 Description

### 1.1 Power, speed, rotation direction, ratio, type plate

ZF marine transmissions are designed and manufactured according to the regulations of the various classification societies. The input powers approved by the classification societies depend on the input speed, the class of the craft and the different design regulations currently in force. In most cases, the maximum torques approved by ZF are also fully accepted by the classification societies.

If requested, the classification society specified by the customer can carry out a full test or factory acceptance test (test stand).

Normally, the input shaft rotates in a clockwise direction (looking at the transmission input flange). Transmissions which are specially designed for anti-clockwise input shaft rotation (looking at the transmission input flange) have an arrow on the transmission input end to show the rotation direction.

The total ratio is stamped on the transmission type plate which is located on top of the transmission housing.

Data included on the type plate:

 <b>FRIEDRICHSHAFEN</b> - GERMANY -	
MODEL	SERIAL NO.
<b>1</b>	<b>2</b>
PARTS LIST NO.	REFERENCE NO.
<b>3</b>	<b>4</b>
RATIO TOTAL	MAIN GEAR
<b>5</b>	<b>6</b>
OIL CAPACITY (litre)	CLUTCH OIL PRESSURE (bar)
<b>6</b>	<b>9</b>
PLEASURE	LIGHT
<b>10</b>	<b>11</b>
MEDIUM	CONTINUOUS
<b>12</b>	<b>13</b>
<b>8</b> OIL CHANGE AFTER FIRST 30 HOURS OPERATION AND EVERY 1350 HOURS OR 12 MONTHS, WHICHEVER OCCURS FIRST. LUBRICANT SEE ZF LIST TE-ML 04 OR 32 OR 68.	

## Key

- 1 Model
- 2 Serial no.
- 3 Parts list no.
- 4 Customer reference no.
- 5 Total ratio and code letter for oil pump ratio
- 6 Oil capacity
- 7 Mass (dry)
- 8 Lubricant, see ZF List of Lubricants TE-ML 04
- 9 Clutch oil pressure (nominal)
- 10 Max. power/speed ratio for fast boats, up to approx. 500 operating hours/year and intermittent operation at very widely differing engine speeds
- 11 Max. power/speed ratio for fast boats, up to approx. 2500 operating hours/year and intermittent operation with widely differing engine speeds
- 12 Max. power/speed ratio for intermittent operation in work boats and charter boats, up to approx. 3500 operating hours/year and differing engine speeds
- 13 Max. power/speed ratio for continuous operation at max. engine power

## NOTE

For items 10 to 13, also refer to Section 12 "Maintenance".

Information under 1, 2, 3 and 5 must be quoted when querying problems and ordering spare parts etc.

The letter stamped after the total ratio (5) has the following meaning:

Letter	Rated engine speed for continuous operation	Engine idle speed
A	≥ 1600	≥ 500

Oil pump ratio A is the standard version.

## 1.2 General information

(See the end of this section for different features of the "BU" series)

The BW 190 Series transmissions (the BW 211 is also part of the BW 190 Series) are abaxial reversing and step-up gears of 3-shaft design with a clutch on both the

