

Breakaway Torque & Back Driving Torque



Definition:

The “breakaway” torque is the torque necessary to slowly start a rotation of the gearbox that is driven from the **input** (high speed) side. A smaller gearbox has lower breakaway torque, a higher ratio that requires **less** breakaway torque.

The “back driving” torque is the torque necessary to slowly start a rotation of the gearbox that is driven from the **output** (slow speed) side. A smaller gearbox has lower breakaway torque and a higher ratio that requires **greater** breakaway torque.

In table below, the referenced torque values for the PLE-, PLS-, WPLE-, and WPLS- are given for four ratios at an ambient temperature of 68° F (20°C).

		Ratio	3	8	20	40
PLS 70	Breakaway torque		0.18	0.1	0.1	0.06
	Back driving torque		0.6	1	2	4
PLS 90	Breakaway torque		0.3	0.2	0.18	0.1
	Back driving torque		1	2	3	5
PLS 115	Breakaway torque		0.6	0.4	0.3	0.13
	Back driving torque		2.2	2.8	4	13
PLS 142	Breakaway torque		1	0.5	0.4	0.3
	Back driving torque		3	4	8	16
PLS 190	Breakaway torque		1.4	0.7	0.6	0.5
	Back driving torque		6	8	16	30
		Ratio	3	8	20	40
WPLS 70	Breakaway torque		0.55	0.3	0.2	0.1
	Back driving torque		1.5	3	4	9
WPLS 90	Breakaway torque		0.7	0.4	0.3	0.14
	Back driving torque		1.8	3.2	5	10
WPLS 115	Breakaway torque		0.8	0.6	0.45	0.3
	Back driving torque		2.2	3	7	13
WPLS 142	Breakaway torque				0.8	0.5
	Back driving torque				13	23
WPLS 190	Breakaway torque					
	Back driving torque					
		Ratio	3	8	20	100
PLE 40	Breakaway torque		0.02	0.015	0.013	0.01
	Back driving torque		0.04	0.06	0.14	1
PLE 60	Breakaway torque		0.03	0.02	0.02	0.015
	Back driving torque		0.06	0.22	0.4	3
PLE 80	Breakaway torque		0.14	0.1	0.09	0.06
	Back driving torque		0.2	0.5	1.8	8
PLE 120	Breakaway torque		0.18	0.12	0.1	0.09
	Back driving torque		0.6	1	2.5	12
PLE 160	Breakaway torque		0.6	0.4	0.3	0.2
	Back driving torque		1.8	3	9	30
		Ratio	3	8	20	100
WPLE 60	Breakaway torque		0.07	0.03	0.03	
	Back driving torque		0.3	0.25	1	
WPLE 80	Breakaway torque		0.2	0.16	0.18	
	Back driving torque		0.5	1	3	
WPLE 120	Breakaway torque		0.3	0.2	0.22	
	Back driving torque		0.85	2	5	