

VOLVO PENTA

Volvo Penta of the Americas
1300 Volvo Penta Drive
Chesapeake, Virginia 23320-9810

Service Bulletin

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High Altitude Gear Ratios Gasoline Engine Sterndrives

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NOTE! This is an updated version of a previously released service bulletin. This bulletin covers **only** "EF" models and models manufactured between 2000–2005.

Boats that consistently operate at high elevations may require carburetor modification¹ and a gear ratio change to compensate for power loss. These changes may be necessary to allow the engine to obtain its recommended maximum RPM. When determining if these changes are necessary, use the following recommendations.

If there is any question as to which model you have, contact Volvo Penta of the Americas, Inc., Technical Service Department at 1-800-445-2628 ext 5901, for gear ratio recommendations at higher altitudes.

- In some applications which operate between 3,500–5,000 ft. the propeller pitch should be reduced approximately 4" (SX Models) or reduce propeller set by 2 sizes DuoProp™ (DP). If reducing propeller size allows the engine to reach its maximum RPM while producing acceptable acceleration characteristics, a gear ratio change may not be necessary.
- The following are gear ratio recommendations for sterndrives at various altitudes.
- Gear ratio modifications exceeding these guidelines may result in loss of warranty coverage.
- Volvo Penta's limited warranty does not cover any expenses for changing the gear ratio for altitude.

2000–2005 MODELS

<i>Engine</i>			<i>SX-M Sterndrives</i>		
Model	Power*	RPM†	Standard Ratios	3500-5000 ft.	5000+ ft.
3.0 GS	135	4400	1.97:1, 2.18:1	2.18:1	2.18:1
3.0 GL	135	4400	1.97:1, 2.18:1	2.18:1	2.18:1
4.3 GL	190	4400	1.66:1, 1.79:1, 1.89:1	1.97:1	1.97:1
4.3 GXi	225	4600	1.66:1, 1.79:1	1.89:1	1.89:1
5.0 GL	220	4600	1.51:1, 1.60:1	1.79:1	1.79:1
5.0 GXi	270	4800	1.51:1, 1.60:1	1.79:1	1.79:1
5.7 GL	260	4600	1.43:1, 1.51:1	1.60:1	1.60:1
5.7 Gi	280	4800	1.43:1, 1.51:1	1.51:1	1.60:1
5.7 GXi	320	4800	1.43:1, 1.51:1‡	1.51:1	1.60:1

* Propeller shaft horsepower

† Recommended RPM

‡ Maximum boat speed 45 mph.

1. Fuel injected engines have built in mixture compensation for altitude and do not require any modifications to the engines.

2000–2005 MODELS (Continued)

<i>Engine</i>			<i>DP-SM Sterndrives</i>		
Model	Power*	RPM†	Standard Ratios	3500-5000 ft.	5000+ ft.
4.3 GL	190	4400	1.95:1, 2.32:1	2.32:1	2.32:1
4.3 Gi	225	4600	1.95:1, 2.32:1	2.32:1	2.32:1
5.0 GL	220	4600	1.78:1, 1.96:1	2.32:1	2.32:1
5.0 Gi	270	4800	1.78:1, 1.96:1	1.96:1	2.32:1
5.7 GL	260	4600	1.78:1, 1.96:1	1.96:1	2.32:1
5.7 Gi	280	4800	1.78:1, 1.96:1	1.96:1	1.96:1
5.7 GXi	320	4800	1.78:1, 1.96:1	1.96:1	1.96:1
8.1 Gi	375	4400	1.78:1, 1.96:1	1.96:1	1.96:1
8.1 GXi	420	4800	1.68:1, 1.78:1	1.78:1	1.78:1

* Propeller shaft horsepower

† Recommended RPM

<i>Engine</i>			<i>XDP Sterndrives</i>		
Model	Power*	RPM†	Standard Ratios	3500-5000 ft.	5000+ ft.
4.3 OSi	225	4600	1.96:1, 2.32:1	2.32:1	2.32:1
5.0 OSi	270	4800	1.78:1, 1.96:1	1.96:1	1.96:1
5.7 OSi	280	4800	1.78:1, 1.96:1	1.96:1	1.96:1
5.7 OXSi	320	4800	1.78:1, 1.96:1	1.96:1	1.96:1
8.1 OSi	375	4400	1.78:1, 1.96:1	1.96:1	1.96:1

* Propeller shaft horsepower

† Recommended RPM

<i>Engine</i>			<i>DPX Sterndrives</i>		
Model	Power*	RPM†	Standard Ratios	3500-5000 ft.	5000+ ft.
DPX 375	375	4600	1.47:1, 1.59:1, 1.68:1, 1.78:1	1.78:1	1.78:1
DPX 420	420	5000	1.47:1, 1.59:1, 1.68:1, 1.78:1	1.68:1	1.78:1

* Propeller shaft horsepower

† Recommended RPM

Propeller recommendations for high altitude gear ratio changes can be obtained from Volvo Penta's Service Department. If the gear ratio has been changed, the owner must be informed that his boat has been modified for high altitude use. If the boat is to be operated at lower elevations, the gear ratio must be changed.

NOTICE! Boats with altered gear ratios for high elevation use should not be used at low elevations, as damage may result and will not be covered under the terms of Volvo Penta's Limited Warranty.

NOTICE! Please consult the appropriate *Sterndrive Workshop Manual* when working on drive units.

EF MODELS

Engine			SX-M Sterndrives		
Model	Power*	RPM†	Standard Ratios	3500-5000 ft.	5000+ ft.
3.0 GS	135	4600	1.97:1, 2.18:1	2.18:1	2.18:1
4.3 GL	190	4600	1.66:1, 1.79:1, 1.89:1	1.97:1	1.97:1
4.3 Gi	205	4800	1.66:1, 1.79:1	1.89:1	1.89:1
5.0 GL	220	4800	1.51:1, 1.60:1	1.79:1	1.79:1
5.0 Gi	250	5000	1.51:1, 1.60:1	1.79:1	1.79:1
5.7 GS	250	4800	1.43:1, 1.51:1	1.60:1	1.60:1
5.7 GSi	280	5000	1.43:1, 1.51:1	1.51:1	1.60:1
5.7 GXi	315	5000	1.43:1	1.51:1	1.60:1
7.4 Gi	310	4600	1.43:1	1.43:1	1.43:1

* Propeller shaft horsepower

† Recommended RPM

Engine			DP-SM Sterndrives		
Model	Power*	RPM†	Standard Ratios	3500-5000 ft.	5000+ ft.
4.3 GL	190	4600	1.95:1, 2.32:1	2.32:1	2.32:1
4.3 Gi	205	4800	1.95:1, 2.32:1	2.32:1	2.32:1
5.0 GL	220	4800	1.78:1, 1.95:1	2.32:1	2.32:1
5.0 Gi	250	5000	1.78:1, 1.95:1	1.95:1	2.32:1
5.7 GS	250	4800	1.78:1, 1.95:1	1.95:1	2.32:1
5.7 GSi	280	5000	1.78:1, 1.95:1	1.95:1	1.95:1
5.7 GXi	315	5000	1.78:1, 1.95:1	1.95:1	1.95:1
7.4 Gi	310	4600	1.68:1, 1.78:1, 1.95:1	1.95:1	1.95:1
7.4 GSi	385	5200	1.68:1, 1.78:1	1.95:1	1.95:1
8.1 Gi	375	5000	1.68:1, 1.78:1	1.78:1	1.95:1
8.1 GSi	420	5000	1.68:1, 1.78:1	1.78:1	1.78:1
8.2 GSi	415	5000	1.68:1, 1.78:1	1.78:1	1.95:1

* Propeller shaft horsepower

† Recommended RPM

EF MODELS (Continued)

Engine			DPX Sterndrives		
Model	Power*	RPM†	Standard Ratios	3500-5000 ft.	5000+ ft.
DPX 375	375	5000	1.47:1, 1.59:1, 1.68:1, 1.78:1	1.78:1	1.78:1
DPX 385	385	5200	1.47:1, 1.59:1, 1.68:1, 1.78:1	1.78:1	1.78:1
DPX 415	415	5000	1.47:1, 1.59:1, 1.68:1, 1.78:1	1.78:1	1.78:1
DPX 420	420	5000	1.47:1, 1.59:1, 1.68:1, 1.78:1	1.78:1	1.78:1
DPX 500	475	5200	1.47:1, 1.59:1, 1.68:1	1.78:1	1.78:1
DPX525	500	5200	1.47:1, 1.59:1, 1.68:1	1.78:1	1.78:1
DPX 600	560	5200	1.47:1, 1.59:1	1.68:1	1.78:1

* Propeller shaft horsepower

† Recommended RPM