

# VOLVO PENTA

**Volvo Penta of the Americas**  
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## Service Bulletin

| Group       | Number   | Version   |
|-------------|----------|-----------|
| <b>44-0</b> | <b>8</b> | <b>03</b> |

### 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 modification<sup>1</sup> 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

| Engine  |        |      | SX-M Sterndrives       |               |           |
|---------|--------|------|------------------------|---------------|-----------|
| 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**

| <b>Engine</b> |               |             | <b>SX-M Sterndrives</b> |                      |                  |
|---------------|---------------|-------------|-------------------------|----------------------|------------------|
| <b>Model</b>  | <b>Power*</b> | <b>RPM†</b> | <b>Standard Ratios</b>  | <b>3500-5000 ft.</b> | <b>5000+ ft.</b> |
| 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

| <b>Engine</b> |               |             | <b>DP-SM Sterndrives</b> |                      |                  |
|---------------|---------------|-------------|--------------------------|----------------------|------------------|
| <b>Model</b>  | <b>Power*</b> | <b>RPM†</b> | <b>Standard Ratios</b>   | <b>3500-5000 ft.</b> | <b>5000+ ft.</b> |
| 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)**

| <b>Engine</b> |               |             | <b>DPX Sterndrives</b>         |                      |                  |
|---------------|---------------|-------------|--------------------------------|----------------------|------------------|
| <b>Model</b>  | <b>Power*</b> | <b>RPM†</b> | <b>Standard Ratios</b>         | <b>3500-5000 ft.</b> | <b>5000+ ft.</b> |
| 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