



# Alternator Pulley Selection Guide



## Technical Service Bulletin

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### ALTERNATOR PULLEY SELECTION GUIDE PULLEY RATIO

The pulley ratio is an important consideration in selecting an alternator pulley, since it is used to determine the proper outer diameter. The pulley ratio is the ratio between the outer diameters of the engine drive pulley and the alternator pulley.

$$\text{PULLEY RATIO} = \frac{\text{Drive Pulley Diameter}}{\text{Alternator Pulley Diameter}}$$

- A pulley with the desired ratio will drive the alternator fast enough at engine idle to charge the electrical system slightly, yet will not drive the alternator too fast (over speed) at the upper end of the engine speed range. In general, pulley ratios of about 2:1 to 3:1 provide good charging system performance and assure longer service life of the alternator bearings.
- For passenger cars, approximately a 2:1 pulley ratio is typical. This pulley ratio provides about 5 to 10 amperes output at idle while limiting alternator RPM at the upper end of the engine speed range. The top speed of the 5" frame alternator should not exceed approximately 8000 maximum continuous RPM.
- For heavy-duty diesel engines, a 3:1 pulley ratio can be used since these engines are governed so as not to exceed 2100 RPM. The top speed of the 6 1/2" frame alternators should be limited to approximately 5000 to 6000 maximum continuous RPM.
- For heavy-duty gasoline engines (trucks) governed to the 3200 to 3600 RPM range, a pulley ratio of slightly less than 3:1 can be used.

### ALTERNATOR PULLEY O.D.

To determine the appropriate outer diameter for the alternator pulley (dimension A in pulley charts), first select the pulley ratio appropriate for the application as outlined in the previous section. Then compute the outer diameter from the following formula. (Note: Use the first number of the ratio for this computation.) The table below lists the ratios for some representative combinations of drive and alternator pulleys.

$$\text{ALTERNATOR PULLEY DIAMETER} = \frac{\text{Drive Pulley Diameter}}{\text{Pulley Ratio (First Number of Ratio)}}$$

Alter. Pulley O.D.	DRIVE PULLEY O.D.												
	4"	4.5"	5"	5.5"	6"	6.5"	7"	7.5"	8"	8.5"	9"	9.5"	10"
2.25"	1.78	2.00	2.22	2.44	2.67	2.89	3.11	3.33	3.56	3.78	4.00	4.22	4.44
2.62"	1.53	1.72	1.91	2.10	2.29	2.48	2.67	2.86	3.05	3.24	3.44	3.63	3.82
2.87"	1.39	1.57	1.74	1.92	2.09	2.26	2.44	2.61	2.79	2.96	3.14	3.31	3.48
3.00"	1.33	1.50	1.67	1.83	2.00	2.17	2.33	2.50	2.67	2.83	3.00	3.17	3.33
3.21"	1.25	1.40	1.56	1.71	1.87	2.02	2.18	2.34	2.49	2.65	2.80	2.96	3.12
3.33"	1.20	1.36	1.50	1.65	1.80	1.95	2.10	2.25	2.40	2.55	2.70	2.85	3.00
3.50"	1.14	1.29	1.43	1.57	1.71	1.86	2.00	2.14	2.29	2.43	2.57	2.71	2.86
4.00"	1.00	1.13	1.25	1.38	1.50	1.63	1.75	1.88	2.00	2.13	2.25	2.38	2.50
4.50"	0.89	1.00	1.11	1.22	1.33	1.44	1.56	1.67	1.76	1.89	2.00	2.11	2.22
5.00"	0.80	0.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	2.00

### PULLEY SELECTION

After the pulley outer diameter is computed, determine the shaft bore diameter, belt size and pulley dimensions as indicated in the diagram on page 2. Then refer to the pulley selection charts and select the appropriate pulley.

**Important:** The information contained in this bulletin is intended for use by trained, professional technicians who have the proper tools, equipment, and training to perform the required maintenance described above. This information is NOT intended for 'do-it-yourselfers', and you should not assume that this information applies to your equipment. If you have any questions regarding this information please visit our website at [www.prestolite.com](http://www.prestolite.com), or contact our technical service department at: