INTERNATIONAL DYNO®

PERFORMANCE GUIDELINES

MARINE DYNAMOMETER MODEL 2000/2003

WARNING: The Model 2000/2003 Marine Dynamometer has been designed for safe operation. However, it must be operated in accordance with the instructions set forth in the "Operator's Manual" and within the parameters set forth in this performance guide. Warranty will be invalidated by improper connection and/or operation of this equipment.

CAUTION! NEVER LEAVE ENGINE/DYNO UNATTENDED DURING OPERATION!

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INTRODUCTION
PERFORMANCE GUIDELINES

The purpose of the following guidelines is to provide a technician with an objective rating against which to compare the performance of the engine being run. Additionally, the value of the pressure reading you obtain are reference points, to measure changes in output resulting from your repairs or tuning. Out unit of measurement on the dynamometer is P.S.I. at a specific R.P.M., rather than directly reading horsepower. You are able to plot the horsepower curve of any engine using R.P.M. and P.S.I. as shown on the following pages. The guidelines contained in this book are manufacturers, factory testing, user feedback, and occasionally estimations. We encourage you to telephone us with your readings on engines that differ significantly from these published figures.

The following is key information that will make your dynamometer and these guidelines more useful/profitable for your operation.

A. Applications

1. New engine setup.
2. 10 - 20 hour check after break-in period.
3. Annual or periodic service work. Dyno readings will reveal the trend of engine operation over time.
4. Guideline to check trade-in engines.
5. Use as a guideline for selling "Dyno Tuning" which is a service you charge for.
6. Guideline to determine if customer engine is performing properly.
7. Guideline to verify work done to the engine has improved performance.

B. Limitations

1. Each set of performance guidelines has test conditions listed. The factors listed below could affect your results, at your shop, on any given day:

    a. Temperature, humidity & barometric pressure.
    b. Fuel variances, such as octane level, vapor pressure, age and storage conditions.
    c. Elevation: every 1000 feet above sea level will decrease horsepower output by approximately 3%.
    d. Non-powerhead related problems such as improper, inadequate, or contaminated gearcase lubricant.
    e. Improper break-in.

C. General Information

1. Terminology

   a. New engine means an engine not broken in.
   b. Used engine means an engine that has been broken in.

2. For use in troubleshooting, you will find that on outboard engines that the following occurs.

   a. V-6 engines will have a 900 P.S.I. pressure drop if one cylinder is dead. V-4 engines will have a 700 P.S.I. pressure drop.
   b. When a power pack breaks down, you will experience a 300 - 400 P.S.I. drop..
   c. High speed misses will show up as fluctuations on the P.S.I. gauge.
   d. Acceleration bogs will show up on instrumentation gauges by the needles just stopping until engine catches itself again.

D. Calculation Guidelines for Older Engines

Since our performance guidelines cover 1977 and newer engines, there will be many times when you will need a guideline for an older engine you are working on. There are three methods that should cover your requirements for any of the older engines you will encounter:

1. If your older engine has the same H.P. and gear ratio as a rated engine on our guideline sheets for that manufacturer, use the R.P.M. and P.S.I. number by 10%.
2. If your engine H.P. does not show up on the charts, but there is a higher and lower H.P. at the same gear ratio as your older engine, interpolate and reduce the P.S.I. by 10%.
3. When a comparable H.P. engine is listed in the guideline, but has a different gear ratio than the one you are working on, the correct P.S.I. can be determined by the following formula:

   (Example) A 2:1 gear ratio is replaced with a 1.85:1 ratio, what should the P.S.I. become assuming the engine H.P. output does not change?

$$2{:}1 = 2.0 \times \frac{5000}{1} \quad \frac{200 \text{ P.S.I.}}{} = 5{,}000{,}000 \text{ Output Units}$$

$$1.85{:}1 = 1.85 \times \frac{5000}{1} \quad \frac{? \text{ P.S.I.}}{} = 5{,}000{,}000 \text{ Output Units}$$

$$? \text{ P.S.I.} = \frac{5{,}000{,}000}{2700} = 1850 \text{ P.S.I.}$$

1850 P.S.I. x .90 for older engine = 1665 P.S.I.

E. Plotting Power Curve

Engine power curves are plotted using the following curve plot and formula:

General Formula: Engine R.P.M. x P.S.I. = Output Units

PROCEDURE (Outboards) :

STEP

1. Close load valve and run engine up to full throttle.
2. Open valve till R.P.M. reaches 4400 R.P.M. - Write down P.S.I.
3. Repeat STEP 2 every 200 R.P.M. up to 5800 R.P.M.
   NOTE: Do not exceed maximum R.P.M. specified by engine manufacturer.
4. Multiply each R.P.M. x P.S.I. to obtain output units.
5. Plot output units on a graph as shown in example below.

Example: Mercury 1989 175 HP

COMPUTATION CHART

RPM	X	PSI	=	OUTPUT UNITS
4400	X	3800	=	16,720,000
4600	X	3725	=	17,135,000
4800	X	3600	=	17,280,000
5000	X	3475	=	17,375,000
5200	X	3350	=	17,420,000
5400	X	3200	=	17,280,000
5600	X	3075	=	17,220,000
5800	X	2950	=	17,110,000
6000	X	2575	=	15,450,000

F. Procedures for use of these Performance Guidelines.**

With dyno connected properly and load valve open, increase the throttle until engine is at approximately 2000 R.P.M.. Lightly close the load valve (clockwise), then accelerate to full throttle. Reduce the load on the engine by slowly opening the load valve (counterclockwise) until the engine reaches the desired R.P.M.. Take note of the engine pressure reading and compare it with the new or used engine P.S.I. values on the chart.

NOTE: System accuracy is limited to ± 4%, or the accuracy with which the instruments can be read.

** Refer to individual performance charts for any special notes pertaining to a given engine.

NOTE: Due to the limited availability of engines for us to run specification numbers, some of the guidelines have been gathered from dealers and averaged. Should you consistently see substantial deviations, please make a note of your findings, and call us. A blank specification sheet has been provided at the end of this book.

MODEL 2000/2003

PERFORMANCE GUIDELINES FOR MERCURY OUTBOARDS

YEAR	H.P.	C.I.D.	GEAR RATIO	R.P.M.	NEW	USED
84 - 89	35	33.3	2.00:1	5500	400	325-425
90 - UP	40	43.9	2.00:1	5500	825	750-850
86 - 89	45	43.9	2.00:1	5500	750	650-800
77 - 84	50	43.8	2.00:1	5500	800	725-800
86 - 90	50	49.8	1.83:1	5500	825	750-825
91 - UP	50	51.8	1.64:1	5500	625	525-625
93 - UP	55	51.8	1.64:1	5500	700	600-700
84 - 90	60	49.8	1.83:1	5500	850	775-875
91 - UP	60	51.8	1.64:1	5500	800	725-825
95 - UP	60	51.8	2.30:1	5500	1025	925-1025
70	65	62.42	2.30:1	5500	1050	900-1100
77 - 79	65/70	49.8	1.64:1	5300	800	725-800
80 - 83	70	49.8	1.83:1	5500	900	800-900
86 - 89	70	71.1	2.30:0	5000	1650	1500-1725
84 - 86	75	66.6	2.31:1	5000	1600	1450-1600
90 - 93	75	71.1	2.30:1	5000	1925	1725-1925
94 - UP	75	84.6	2.30:1	5000	1900	1700-1900
77 - 83	80/85	66.6	2.31:1	5000	1600	1450-1600
86 - 89	80	71.1	2.30:1	5000	1500	1350-1550
77 - 81	90	99.8	2.00:1	5000	1700	1550-1700
82 - 86	90	99.8	2.00:1	5300	1750	1575-1750
86 - 93	90	71.1	2.30:1	5000	2200	2000-2200
94 - UP	90	84.6	2.30:1	5250	2200	2000-2200
87 - 93	100	105	2.07:1	5000	2300	2100-2300
94 - UP	100	113	2.07:1	5000	2300	2100-2300
77 - 81	115	99.8	2.00:1	5300	1750	1575-1750
82 - 87	115	99.8	2.00:1	5000	2200	2050-2250
88 - 93	115	105	2.07:1	5000	2800	2450-2800
94 - UP	115	113	2.07:1	5000	3000	2500-2800
94 - UP	125	113	2.07:1	5000	3000	2800-3000
86 - UP	135	121.9	2.00:1	5300	3400	3150-3400
77 - 83	140	99.8	2.00:1	5000	2350	2150-2350
				5500	2250	2050-2250
78 - 81	150	121.9	2.00:1	5000	3150	2850-3150
				5500	2800	2550-2800
82 - UP	150	121.9	2.00:1	5000	3350	3100-3350
				5500	3200	2950-3200
86 - 88	150XR2	121.2	2.00:1	5500	3300	3050-3300
				6000	3100	2825-3100

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M2000/2003 Mercury Outboard Performance Guidelines Update

HP	RPM	Gear ratio	PSI
30	5500	2:1	600-700
40	5500	2:1	750-850
50	5000	2.3:1	750-850
60	5000	1.64:1	725-825
60 Bigfoot	5000	2.3:1	925-1025
75	5000	2.3:1	1725-1925
90	5000	2.3:1	2000-2200
115	5000	2.07:1	2500-2800
125	5000	2.07:1	2800-3000
135	5000	2:1	3150-3400
150	5500	2:1	3050-3300
150XR6&EFI		1.87:1	2900-3250
175	5500	2:1	3400-3500
175EFI		1.87:1	3250-3650
200	5500	1.87:1	3550-3850
200EFI		1.87:1	3600-3900
200OpMax		1.75:1	3400-3700
225	5500	1.75:1	3750-4050
225EFI		1.75:1	3800-4075
225OpMax		1.75:1	3825-4100

1/17/2000

MODEL 2000/2003
PERFORMANCE GUIDELINE FOR MERCURY OUTBOARDS
(CONTINUED)

88 - 91	150XR4	142.2	1.78:1	5000	3150	2875-3200
				5500	2950	2750-3000
92 - UP	150XR6	153	1.78:1	5300	3400	3100-3400
93 - UP	150XR6	153	1.87:1	5300	3150	2900-3250
93 - 94	150XRI	153	1.87:1	5300	3200	2950-3300
76 - 82	175	121.9	2.00:1	5000	3375	3100-3375
				5500	3000	2700-3000
85 - 91	175	142.2	1.87:1	5000	3600	3375-3700
				5500	3425	3200-3525
92 - UP	175	153	1.87:1	5300	3600	3300-3600
91	175XRI	142.2	187:01:00	5000	3650	3400-3800
				5500	3500	3250-3650
92 - UP	175XRI	153	1.87:1	5300	3600	3350-3600
78 - 81	200	142.2	2.00:1	5000	4000	3650-4200**
				5500	3700	3400-3900
82 - 90	200	142.2	1.87:1	5000	3925	3650-4125**
				5500	3750	3450-3750
91 - UP	200	153	1.87:1	5000	3950	3650-3975
				5500	3850	3550-3850
91 - UP	200 OS	153	1.87:1	5000	3950	3650-3975
				5500	3750	3450-3775
89 - 90	200XRI	142.2	1.87:1	5000	4000	3800-4050**
				5500	3850	3675-3900
91 - UP	200XRI	153	1.87:1	5000	3950	3950-4200**
				5500	3850	3850-4100**
87 - 88	220XRI	142.2	1.87:1	5500	3950	3600-4100**
				6000	3750	3400-3900
80 - 81	225	142.2	1.87:1	5000	3925	3610-4125**
				5500	3750	3350-3750
94	225	185	1.64:1	5250	**	

** You may have difficulty holding engines at or above this range, depending on the particular engine and age of the dynamometer. Exercise caution when running the higher engines, and run at full throttle only for a few moments.

MODEL 2000/2003
PERFORMANCE GUIDELINES FOR MARINER OUTBOARDS

YEAR	H.P.	C.I.D.	GEAR RATIO	R.P.M.	NEW	USED
85 - 90	40	36.1	2.00:1	5000	725	625-750
90 - UP	40 MAG	43.9	2.00:1	5000	825	750-850
86 - 89	45	43.9	2.00:1	5500	750	650-800
77 - 84	48	46.4	1.84:1	5500	750	650-825
77 - 84	50	43.8	2.00:1	5500	800	725-800
86 - 90	50	49.8	1.83:1	5500	825	750-825
91 - UP	50	51.8	1.64:1	5500	750	675-775
84	55	46.4	1.72:1	5500	850	775-875
77 - 82	60	46.4	1.72:1	5500	850	775-875
82 - 84	60	48.7	1.72:1	5000	900	825-950
				5500	850	725-875
84 - 90	60	49.8	1.83:1	5500	850	775-875
91 - UP	60	51.8	1.64:1	5500	800	725-825
77 - 79	70	49.8	1.64:1	5300	800	725-800
80 - 83	70	49.8	1.83:1	5300	950	950-1000
				5500	900	800-900
84 - 86	75	66.6	2.31:1	5000	1600	1450-1600
86 - UP	75	71.1	2.30:1	5000	1650	1500-1725
77 - 83	80/85	66.6	2.31:1	5000	1600	1450-1600
				5500	1400	1250-1400
77 - 81	90	99.8	2.00:1	5000	1700	1550-1700
82 - 86	90	99.8	2.00:1	5300	1750	1575-1750
86 - UP	90	71.1	2.30:1	5000	1850	1700-1900
87 - UP	100	105	2.07:1	5000	1950	1800-2000
77 - 81	115	99.8	2.00:1	5300	1750	1575-1750
82 - 87	115	99.8	2.00:1	5000	2200	2050-2250
88 - UP	115	105	2.07:1	5000	2450	2250-2600
86 - UP	135	121.9	2.00:1	5000	2600	2400-2650
				5500	2450	2250-2500
77 - 83	140	99.8	2.00:1	5000	2350	2150-2350
				5500	2250	2050-2250
78 - 81	150	121.9	2.00:1	5000	3150	2850-3150
				5500	2800	2550-2800

YEAR	H.P.	C.I.D.	GEAR RATIO	R.P.M.	NEW	USED
82 - 84	150	121.9	2.00:1	5000	3375	3100-3550
84 - UP	150	121.9	2.00:1	5000	3200	3000-3250
86 - 87	150MAG	121.9	2.00:1	5500	3300	3050-3300
				6000	3100	2825-3100
88 - 91	150MAGII	142.2	1.78:1	5000	3150	2875-3200
				5500	2950	2750-3000
92 - UP	150MAG	153	1.78:1	5300	3000	2800-3100
93	150MAG	153	1.87:1	5300	3150	2900-3250
93	150EFI	153	1.87:1	5300	3200	2950-3300
77 - 82	175	121.9	2.00:1	5000	3375	3100-3375
				5500	3000	2700-3000
85 - 91	175	142.2	1.87:1	5000	3600	3375-3700
				5500	3425	3200-3525
92 - UP	175	153	1.87:1	5300	3600	3350-3600
89 - 90	175SKI EFI	142.2	2.00:1	5000	3650	3400-3800
				5500	3500	3250-3650
91	175MAG EFI	142.2	1.87:1	5000	3650	3400-3800
				5500	3500	3250-3650
92 - UP	175MAG EFI	153	1.87:1	5300	3500	3340-3650
78-81	200	142.2	2.00:1	5000	4000	3650-4200**
				5500	3700	3400-3900
82 - 90	200	142.2	1.87:1	5000	3950	3650-4125**
				5500	3750	3350-3750
91 - UP	200	153	1.87:1	5000	3950	3650-3975
				5500	3850	3550-3850
91 - UP	200 OS	153	1.87:1	5000	3950	3650-3975
				5500	3750	3450-3775
92 - UP	200MAG EFI	153	1.87:1	5300	3850	3550-3850
86 - 88	220EFI	142.2	1.87:1	5500	3950	3600-4100**
				6000	3750	3350-3750

** IT IS ADVISABLE TO RUN ONLY A FEW MOMENTS AT PRESSURES THAT EXCEED 4000 POUNDS. NEVER EXCEED 4200 PSI PRESSURE.

MODEL 2000/2003
PERFORMANCE GUIDELINES
MERCRUISER I / O

YEAR	MODEL	CRANK	PROP	L / C.I.D.	GEAR	RPM	P.S.I. RANGE
		HP	HP / KW		RATIO		
78 - 85	120	120		2.5/153	1.98:1	4300	1750-2000
86 - 89	120	120		2.5/153	1.98:1	4300	1750-2000
90 - 95	3.0L/AL	125	115/86	3.0/181	1.98:1	4600	1800-2050
87 - 89	130	130		3.0/181	1.98:1	4600	1850-2100
78 - 86	140	140		3.0/181	1.98:1	4600	1850-2100
90 - UP	3.0LX/A1	145	135/101	3.0/181	1.98:1	4600	1900-2150
96 - UP	3.0LX/A1	135		3.0/181	1.94	4600	1900-2150
					2.4	4600	2250-2550
78 - 82	165	165		3.8/250	1.65:1	4300	1950-2200
87 - 89	165	165		3.7/224	1.84:1	4400	2800-3000
78 - 84	470	170		3.7/224	1.84:1	4200	2900-3275
78 - 84	470	170		3.7/224	1.65:1	4200	2900-3275
85 - 86	170	170		3.7/224	1.84:1	4600	2600-2925
85 - 86	170	170		3.7/224	1.65:1	4600	2350-2626
87 - 92	4.3L/A1	175	155/116	4.3/262	1.84:1	4800	2650-3000
93 - 95	4.3L/A1		160/119	4.3/262	1.84:1	4600	2750-3100
96 - UP	4.3L	ALPHA	160	4.3/262	1.81	4600	2750-3100
		ALPHA			1.62	4600	2650-2950
		ALPHA			1.94	4600	2850-3150
87 - 89	180	180		3.7/224	1.84:1	4600	2700-3025
83 - 84	185	185		3.7/229	1.84:1	4800	2750-3025
83 - 84	185	185		3.7/229	1.65:1	4800	2475-2700
85 - 86	185	185		4.3/262	1.84:1	4800	2775-3050
85 - 86	186	185		4.3/262	1.65:1	4800	2550-2825
80 -82	185	185		3.7/224	1.84:1	4600	2800-3200
73 - 84	188	188		3.7/224	1.84:1	4800	2650-2925
83 - 84	188	188		3.7/224	1.65:1	4800	2800-3200
85 - 86	190	190		3.7/224	1.84:1	4800	2925-3200
85 - 86	190	190		3.7/224	1.65:1	4800	2650-2925
77	188	188		5.0/302	1.50:1	4200	2950-3350
78 - 84	198	198		5.0/305	1.50:1	4200	2850-3250
78 - 84	198	198		5.0/305	1.65:1	4200	2950-3225
85 - 86	200	200		5.0/305	1.50:1	4600	2700-3025
85 - 92	4.3LX/A1	205	175/131	4.3/262	1.84:1	4800	3300-3550
93 - 95	4.3LX/A1		180/134	4.3/262	1.84:1	4600	3400-3650

(CONTINUED)

YEAR	MODEL	CRANK	PROP	L / C.I.D.	GEAR	RPM	USED
		HP	HP / KW		RATIO		
96 - UP	4.3LX	ALPHA	180	4.4/262	1.81	4600	3400-3650
		ALPHA			1.62	4600	2900-3200
		ALPHA			1.94	4600	3250-3550
85 - 92	5.0L/A1	200	180/134	5.0/305	1.65:1	4600	2975-3250
93 - 95	5.0L/A1		190/142	5.0/305	1.65:1	4600	3125-3400
85 - 86	205	205		4.3/262	1.84:1	4800	3250-3625
78 - 84	228	228		5.0/305	1.50:1	4600	2950-3350
85 - 95	5.0LX/A1	230	205/153	5.0/305	1.50:1	4600	3000-3350
96 - UP	5.7L/2BBL	ALPHA	210	5.7/350	1.47	4400	3150-3450
		ALPHA			1.62	4400	3450-3750
		ALPHA			1.81		3900-4200**
		BRAVO2			2		4000+ ***
		BRAVO2			2.2		4000+ ***
77	233	233		5.8/351	1.32:1	4200	2950-3350
77	250	250		5.7/350	1.32:1	4400	3300-3775
78 - 86	260	260		5.7/350	1.32:1	4600	3050-3525
78 - 92	5.71/A1	260	230/172	5.7/350	1.50:1	4600	3500-3990
93 - 95	5.71/A1		235/175	5.7	1.50:1	4600	3600-4100

ANY ABOVE 260 HP - DO NOT RUN ON DYNO AT FULL THROTTLE.
**IT IS ADVISABLE TO RUN ONLY A FEW MOMENTS
AT PRESSURES THAT EXCEED 4000 POUNDS.
NEVER EXCEED 4200 PSI PRESSURE.
SOME ENGINES BELOW 260 HP MAY NOT BE HELD BELOW 4200 PSI
AT FULL THROTTLE, DEPENDING ON GEAR RATIO.

M2000/2003

PERFORMANCE GUIDELINES FOR OMC OUTBOARDS

YEAR	MODEL	CID	GEAR RATIO	RPM	NEW	USED
85 - UP	40	44.99	2.40:1	5000	1025	900-1050
80 - 82	50	44.99	2.40:1	5000	1150	1075-1200
83 - UP	50	44.99	2.40:1	5000	1200	1075-1200
78 - 79	55	44.99	2.40:1	5000	1000	900-1000
80 - 83	55	44.99	2.60:1	5000	1400	1275-1400
81 - 82	60	44.99	2.40:1	5000	1225	1100-1225
83 - 85	60	44.99	2.40:1	5000	1250	1100-1250
86 - 88	60	49.7	2.40:1	5000	1325	1150-1350
89 - UP	60	56.1	2.40:1	5000	1350	1175-1375
78 - 79	70	49.7	2.40:1	5000	1450	1325-1450
80 - 85	70	49.7	2.40:1	5000	1650	1500-1650
85 - UP	70	56.1	2.40:1	5000	1700	1550-1750
78 - 79	75	49.7	2.40:1	5000	1425	1300-1425
80 - 84	75	49.7	2.40:1	5000	1625	1475-1625
80 - 88	75SS	49.7	1.86:1	5500	1250	1125-1250
78	85	92.6	2.00:1	5000	1725	1550-1725
79 - 83	85	99.6	2.00:1	5000	1800	1625-1850
91 - UP	85BT	99.6	2.00:1	5000	1850	1675-1900
81 - 84	90	99.6	2.00:1	5000	2100	1925-2100
85 - 95	90	99.6	2.00:1	5000	2175	1950-2200
95 - UP	90	105.4	2.00:1	5000		1950-2200
78 - 79	100	99.6	2.00:1	5000	1975	1750-1975
80 - 83	100	99.6	2.00:1	5000	2050	1850-2050
88 - UP	100XP/GT	99.6	2.00:1	5000	2100	1900-2150
86 - 89	110	99.6	2.00:1	5000	2250	2025-2250
78 - 79	115	99.6	2.00:1	5000	2175	1925-2200
80 - 84	115	99.6	2.00:1	5000	2250	2025-2250
90 - UP	115	99.6	2.00:1	5000	2300	2150-2400
95 - UP	115	105.4	2.25:1	6000		2350-2650
95 - UP	115 F.S.	105.4	2.00:1	5500		2350-2650
85 - 87	120	110	2.15:1	5000	2500	2325-2520
88 - 94	120	122	2.00:1	5000	2425	2300-2500
				5500	2275	2100-2350
89	120	122	2.25:1	5000	2525	2375-2575
				5500	2375	2225-2450

INTERNATIONAL DYNO®

OMC Outboard Performance Guidelines Update Model 2000/2003

Model	Gear Ratio	R.P.M.	P.S.I.
35	2.15:1	5500	625-725
40	2.42:1	5000	900-1050
50	2.42:1	5500	1075-1200
60	2.42:1	5500	1175-1375
70	2.42:1	5500	1550-1750
90	2.0:1	5000	1950-2200
115	2.25:1	5000	2350-2650
115	2.0:1	5000	2150-2400
115 FastStrike	2.0:1	5500	2350-2650
130	2.25:1	5500	2600-2900
150	1.86:1	5000	2775-3075
150Ficht	1.86:1	5000	2800-3050
175	1.86:1	5000	3225-3600
175 Ficht	1.86:1	5000	3125-3700
200	1.86:1	5500	3500-3850
225	1.86:1	5500	3750-4100

(CONTINUED)

YEAR	MODEL	CID	GEAR RATIO	RPM	NEW	USED
95 - UP	130	122	2.25:1	5500	2900	2600-2900
78	140	99.6	1.90:1	5000	2425	2200-2425
79 - 84	140	99.6	2.00:1	5000	2450	2200-2450
85 - 87	140	110	2.15:1	5000	2750	2500-2750
				5500	2625	2400-2650
88 - UP	140	122	2.25:1	5000	2825	2600-2850
				5500	2700	2475-2750
88 - UP	140	122	2.00:1	5000	2600	2375-2650
				5500	2475	2250-2500
78 - 83	150	149.4	1.85:1	5000	2950	2650-2950
84 - 91	150	149.4	1.85:1	5500	3050	2750-3050
92 - UP	150	158	1.85:1	5000	3050	2775-3075
83 - 91	150XP/GT	149.4	1.85:1	5500	2800	2550-2800
91 - UP	150SF/SI	158	1.85:1	5000	3050	3000-3300
78 - 79	175	149.4	1.85:1	5000	3500	3150-3500
80 - 85	175	149.4	1.85:1	5000	3350	3000-3350
86 - 91	175	160.3	1.85:1	5000	3500	3200-3575
				5500	3100	2850-3175
92 - UP	175	158	1.85:1	5000	3525	3225-3600
				5500	3125	2900-3200
88 - 91	175XP/GT	160.3	1.85:1	5000	3525	3225-3600
				5500	3125	2900-3200
91 - UP	175SF/SI	158	1.85:1	5000	3525	3650-3950
				5500	3125	3350-3650
84	185	149.4	1.85:1	5000	3450	3100-3450
78 - 89	200	149.4	1.85:1	5250	3450	3100-3450
80 - 85	200	149.4	1.85:1	5250	3650	3275-3650
86 - 87	200	165	1.85:1	5000	3950	3650-4000**
				5500	3825	3500-3850
88 - UP	200	183	1.85:1	5000	3950	3650-4000**
				5500	3825	3500-3850
86 - 87	200XP/GT	165	1.85:1	5000	4000	3700-4025**
				5500	3825	3500-3875
88 - UP	200XP/GT	183	1.85:1	5000	4000	3750-4100**
				5500	3825	3550-3875

(CONTINUED)

YEAR	MODEL	CID	GEAR RATIO	RPM	NEW	USED
86 - 87	225	165	1.85:1	5500	3600	3350-3650
88 - UP	225	183	1.85:1	5000	3750	3475-3800
				5500	4000	3750-4050**
78 - 79	235	149.4	1.85:1	5000	3600	3275-3600
80 - 84	235	160.3	1.85:1	5250	3850	3500-3850

OMC SEA DRIVES

YEAR	MODEL	CID	GEAR RATIO	RPM	NEW	USED
83 - UP	V-4, 1.6L	99.6	2.00:1	5000	2250	2050-2360
85 - 88	V-4, 1.8L	110	2.00:1	5500	2700	2500-2750
89 - UP	V-4, 2.0L	122	2.25:1	5500	2625	2400-2650
83 - 86	V-6, 2.5L	155.6	1.85:1	5000	2950	2650-3100
83 - 88	V-6, 2.6L	160.3	1.85:1	5250	3650	3325-3825
85 - 88	V-6, 2.7L	165	1.85:1	5500	3600	3350-3650
89 - UP	V-6, 3.0L	183	1.85:1	5500	3825	3550-3875
85 - 90	V-8, 3.6L	220	1.76:1	DO NOT RUN ON DYNO		
91	V-8, 4.0L	244	1.76:1	DO NOT RUN ON DYNO		

** IT IS ADVISABLE TO RUN ONLY A FEW MOMENTS AT PRESSURES THAT EXCEED 4000 POUNDS.

MODEL 2000/2003
PERFORMANCE GUIDELINES
FOR OMC STERN DRIVE SYSTEMS

OMC STERN DRIVE

YEAR	MODEL	ID	GEAR RATIO	RPM	NEW	USED
78 - 83	120	153	1.65:1	4400	1600	1475-1675
84 - 86	120	153	1.71:1	4400	1600	1475-1675
78 - 83	140	181	1.65:1	4400	1900	1750-2000
84 - 86	140	181	1.71:1	4400	1900	1750-2000
81 - 86	170	229	1.77:1	4600	2600	2375-2725
78 - 83	185	305	1.50:1	4400	2300	2100-2425
84 - 86	185	229	1.77:1	4400	2300	2100-2425
79 - 83	200	305	1.50:1	4400	2875	2650-3000
78	225	305	1.41:1	4400	2800	2575-2950
79 - 83	230	305	1.50:1	4400	3300	3100-3350
75	230	305	1.50:1	4400	2850	2600-2975
84 - 86	235	351	1.16:1	4400	2250	2050-2400
78	240	351	1.41:1	4400	3400	3125-3575
79	250	351	1.41:1	4400	3450	3175-3625
79 - 86	260	305	1.41:1	4400	3650	3400-3850

OMC COBRA DRIVE SYSTEMS

YEAR	MODEL	CR HP	PROP HP/KW	L/C ID	GEAR	RPM	NEW	USED
86	120	120		2.5/153	1.71:1	4400	1600	1475-1675
87	120	120		2.3/140	2.00:1	5400	1800	1650-1850
88 - 91	2.3L	128	115/85	2.3/140	2.00:1	5400	1850	1700-1900
87 - 89	130	130		3.0/181	1.71:1	4400	1725	1575-1775
90 - UP	3.0L	130	115/85	3.0/181	1.86:1	4400	2450	2275-2500
86	140	140		3.0/181	1.71:1	4400	1900	1750-2000
90 - 92	3.0LH0	150	130/97	3.0/181	1.86:1	4400	2675	2525-2700
93	3.0LH0	150	135/101	3.0/181	1.86:0	4400	2750	2600-2775
86 - 92	4.3L	175	150/112	4.3/262	1.68:1	4400	2750	2600-2800
93	4.3L	175	160/119	4.3/262	1.68:1	4400	2900	2750-2950
88 - 92	5.0L	185	160/120	5.0/302	1.59:1	4400	3150	2925-3200
93	5.0L	185	170/127	5.0/302	1.59:1	4400	3300	3075-3350
88	200	200		5.0/305	1.50:1	4400	3450	3225-3500
89 - 92	5.0LH0	200	175/130	5.0/302	1.59:1	4400	3500	3275-3550

YEAR	MODEL	CR HP	PROP HP/KW	L/C ID	GEAR	RPM NEW	USED
86 - 91	4.3LHO	205	175/130	4.3/262	1.68:1	4600 3150	2925-3200
93	4.3LHO	205	180/134	4.3/262	1.68:1	4400 3225	3000-3275
93	5.0LHO	200	190/142	5.0/302	1.59:1	4400 3700	3475-3750
93	5.0LEFI	225	200/150	5.0/302	1.50:1	4400 3450	3250-3550
86 - 88	230	230		5.0/305	1.50:1	4400 3300	3100-3350
89 - 91	5.8L	235	210/155	5.8/351	1.41:1	4400 3200	3000-3300
92 - UP	5.8L	240	215/160	5.8/351	1.41:1	4400 3250	3050-3350
86 - 92	5.7L	260	220/165	5.7/350	1.41:1	4400 3650	3400-3750
90 - 91	5.7LLE	260	220/165	5.7/350	1.43:1	4400 3675	3425-3800
92	5.7LLE	260	220/165	5.7/350	1.50:1	4400 3750	3550-3850
88 - 91	350KC	270	235/175	5.7/350	1.41:1	4400 3860	3700-3950
93	5.8LEFI	265	240/179	5.8/351	1.50:1	4400 4050	3850-4150**

**IT IS ADVISABLE TO RUN ONLY A FEW
MOMENTS AT PRESSURES THAT
EXCEED 4000 POUNDS.
NEVER EXCEED 4200 PSI PRESSURE.

MODEL 2000/2003
PERFORMANCE GUIDELINES
SUZUKI

YEAR	MODEL	CID	GEAR RATIO	RPM	NEW	USED
82 - 89	35	42.5	2.09:1	5000	775	700-800
82 - UP	40	42.5	2.09:1	5000	850	775-900
82 - 84	50	48.7	2.18:1	5100	1000	925-1050
85 - UP	55	54.4	1.92:1	5100	1075	950-1125
82 - 85	60	48.7	1.92:1	5100	1050	960-1150
82 - 84	65	48.7	1.92:1	5100	1200	1100-1275
85 - UP	65	54.4	1.92:1	5100	1250	1100-1300
84 - UP	75	73	2.08:1	5100	1650	1550-1750
82 - UP	85	73	2.08:1	5100	1850	1700-1950
89	90	86.6	2.08:1	5100	1925	1775-2025
90 - UP	90	86.6	1.86:1	5100	1400	1250-1450
90 - UP	100	86.6	1.86:1	5100	1550	1400-1600
90 - 91	100S4	86.6	1.86:1	5100	1550	1400-1600
82 - 85	115	108.2	2.08:1	5100	2150	1975-2250
86 - 89	115	108.2	2.08:1	5100	2200	2000-2250
90	115	108.2	1.86:1	5100	1750	1600-1800
91 - UP	115	108.2	2.08:1	5100	2200	2000-2250
82 - 85	140	108.2	2.08:1	5100	2750	2525-2890
				5500	2900	2650-3050
86 - 89	140	108.2	2.08:1	5100	2750	2525-2850
90	140	108.2	1.86:1	5100	2100	1950-2150
91 - UP	140	108.2	2.08:1	5100	2750	2525-2850
86 - UP	150	164.3	1.86:1	5000	2450	2350-2500
				5500	2175	1950-2250
87 - 92	150SS	164.3	1.86:1	5000	2650	2400-2750
93	150EFI	164.3	2.80:1	5500	2350	2150-2400
				5500	2625	2475-2775
87 - 92	175	164.3	1.86:1	5000	2950	2725-3000
				5500	2500	2275-2550
86 - UP	200	164.3	1.86:1	5000	3500	3275-3550
				5500	3300	3075-3350

YEAR	MODEL	CID	GEAR RATIO	RPM	NEW	USED
86 - UP	200	164.3	1.86:1	5000	3500	3275-3550
				5500	3300	3075-3350
87 - 92	200E	164.3	1.86:1	5000	3500	3275-3550
				5500	3300	3075-3350
90 - UP	225	164.3	1.86:1	5000	3950	3750-4000
				5500	3750	3550-3800

****IT IS ADVISABLE TO RUN ONLY A FEW MOMENTS AT PRESSURES THAT EXCEED 4000 POUNDS. NEVER EXCEED 4200 POUNDS.**

MODEL 2000/2003
PERFORMANCE GUIDELINES
YAMAHA OUTBOARDS

YEAR	MODEL	C.I.D./ L	GEAR RATIO	RPM	NEW	USED
86 - UP	40	42.6/698CC	1.85:1	5500	800	700-900
91 - UP	CV40	31.6/592CC	2.00:1	5000	850	750-925
84 - UP	50	42.6/698CC	1.85:1	5000	950	850-1050
87 - UP	PRO50	42.6/698CC	1.85:1	5000	1000	875-1050
91 - UP	CV55	46.4/760CC	1.85:1	5000	1050	925-1100
91 - UP	PRO60	51.8/849CC	2.33:1	5000	1450	1325-1500
84 - UP	70	51.8/849CC	2.33:1	5000	1700	1550-1875
91 - UP	CV85	69.6/1.14	2.00:1	5000	1775	1625-1800
84 - UP	90	69.6/1.14	2.00:1	5000	1875	1700-2050
84 - 85	115	105.5/1.73	2.00:1	5000	2450	2250-2700
				5500	2050	1900-2250
86 - UP	115	105.5/1.73	2.00:1	5000	2500	2300-2700
				5500	2125	1950-2250
91 - UP	CV115	105.5/1.73	2.00:1	5000	2500	2300-2700
				5500	2125	1950-2250
87 - UP	130	105.5/1.73	2.00:1	5000	2850	2600-2900
				5500	2700	2500-2775
84 - UP	150	158.4/2.596	1.86:1	5000	2900	2650-3200
				5500	2500	2300-2750
86 - UP	150PRO	158.4/2.596	2.00:1	5000	3350	3150-3450
				5500	3250	3100-3425
85 - UP	175	158.4/2.596	1.86:1	5000	3275	2950-3600
				5500	2950	2650-3250
84 - UP	200	158.4/2.596	1.86:1	5000	3650	3300-3900
				5500	3425	3100-3775
91	200PRO	158.4/2.596	1.86:1	5000	3750	3600-4100
				5500	3525	3400-3975
84 - 87	220	158.4/2.596	1.73:1	5000	4000	3675-4200**
				5500	3800	3500-4000
87 - UP	225	158.4/2.596	1.80:1	5500	4100	3800-4300**
				5800	4000	3700-4200**
91	250	191.0/3.130	1.81:1	DO NOT	RUN	ON DYNO

** IT IS ADVISABLE TO RUN ONLY A FEW MOMENTS
AT PRESSURES THAT EXCEED 40000 PSI.

PERFORMANCE GUIDELINES
YAMAHA I/O

YEAR	MODEL	CRANK HP	PROP HP	L / C.I.D.	GEAR RATIO	RPM	NEW	USED
90 - UP	3.0L	130	110	3.0/181	1.97:1	4600	2000	1850-2075
88 - UP	4.3I	205	180	4.3/262	1.84:1	4600	3350	3150-3400
88 - UP	5.0L	230	210	5.0/305	1.50:1	4600	3300	3100-3350
88 - UP	5.7L	260	240	5.7/350	1.50:1	4600	3800	3500-3975
92 - UP	7.4L		300	7.4/454	1.50:1	DO NOT RUN ON DYNO		

MODEL 2000/2003
PERFORMANCE GUIDELINES
CHRYSLER OUTBOARDS

YEAR	MODEL	C.I.D.	GEAR RATIO	RPM	NEW	USED
78 - 83	50	49.9	1.62:1	5000	575	500-600
				5500	475	400-525
82 - 83	55	49.9	1.62:1	5000	600	525-625
				5500	500	425-525
84 - 85	60	49.9	1.62:1	5000	650	575-675
78 - 83	65	49.9	1.62:1	4000	600	550-600
78 - 85	75	72.4	2.00:1	5000	1525	1400-1525
78 - 85	85	72.4	2.00:1	5000	1400	1225-1450
				5500	1250	1100-1300
83	90	96.52	1.73:1	5000	1375	1225-1400
				5500	1250	1125-1275
78 - 85	100	96.52	2.00:1	5000	1775	1625-1775
				5500	1625	1495-1625
78 - 83	105	96.5	1.73:1	5000	1525	1400-1525
				5500	1400	1275-1400
78 - 85	115	99.9	1.73:1	5000	1775	1625-1775
				5500	1600	1475-1600
82 - 83	125	99.2	1.73:1	5000	1750	1600-1750
78 - 81	140	103	1.73:1	5000	2050	1950-2050
				5500	1825	1675-1825
82 - 85	140	103	1.73:1	5250	1850	1700-1850

FORCE OUTBOARD SPECIFICATION

YEAR	MODEL	CID	GEAR RATIO	RPM	NEW	USED
92 - UP	40	150.1	1.61:1	5000	575	475-600
86 - 89	50	44.7	1.62:1	5000	575	475-600
				5500	475	400-525
90 - 91	50	48.3	1.61:1	5000	1000	850-1050
				5500	800	700-850
92 - UP	50	50.1	1.61:1	5250	900	800-950
91 - UP	70	75.1	1.64:1	5000	1200	1050-1250
				5500	1075	825-1125
86 - 88	85	72.4	2.00:1	5000	1400	1225-1450
				5500	1250	1100-1300
89 -90	85	72.4	1.93:1	5000	1600	1450-1625
90	90	72.39	1.93:1	5000	1700	1550-1750
91 - UP	90	75.1	1.93:1	5000	1800	1650-1850
90	120	99.2	1.93:1	5000	2450	2275-2500
91 - UP	120	102.9	1.93:1	5000	2500	2325-2550
86 - 89	125	99.2	1.73:1	5000	1750	1600-1750
89 - 90	150	124	1.93:1	5000	3050	2700-2850
91 - UP	150	128.6	1.93:1	5000	3100	2750-2900

MODEL 2000/2003
ERFORMANCE GUIDELINES FOR
TOHATSU - NISSAN OUTBOARDS

YEAR	MODEL	CID	GEAR RATIO	RPM	NEW	USED
86 - UP	40	30.1	1.92:1	5500	475	400-525
91 - UP	40	42.5	1.85:1	5000	750	650-800
91 - UP	50	42.5	1.85:1	5000	850	750-900
88 - 91	50	45.7	1.92:1	5000	675	575-700
86 - 87	55	45.7	1.92:1	5000	850	750-875
88 - 92	60	51.6	1.92:1	5500	1000	875-1050
92 - UP	60	57.2	1.92:1	5500	1000	875-1050
86 - 92	70	51.6	1.92:1	5500	1150	1000-1200
92 - UP	70	57.2	1.92:1	5500	1150	1000-1200
88 - UP	90	77.3	2.00:1	5000	1850	1700-1900
				5500	1700	1550-1750
89 - UP	120	107.9	2.00:1	5000	2350	2200-2425
				5500	2200	2050-2275
89 - UP	140	107.9	2.00:1	5000	2650	2475-2675
				5500	2450	2275-2475

MODEL 2000/2003
VOLVO STERN DRIVE SPECIFICATION

MODEL	HP	C.I.D.	GEAR	RPM	NEW	USED
AQ125A/270D	117	130	2.15:1	4600	2450	2300-2500
AQ125/B270D	120	140	2.15:1	4000	3000	2850-3025
AQ131A/275	120	141	2.15:1	4600	2500	2350-2550
AQ145A/290D	138	140	2.15:1	4000	3200	3050-3250
AQ145A/290D	138	140	2.15:1	4000	3200	3050-3250
AQ145B/290D	138	141	2.15:1	4000	3200	3050-3250
AQ151A/290D	146	152	2.15:1	4800	2650	2475-2700
	170	182	1.89:1	4500	2800	2650-2850
AQ171/290	167	152	2.15:1	5500	2400	2250-2450
AQ200D/290B	200	305	1.61:1	4000	3900	3750-3950
AQ225D/290B	225	305	1.61:1	4000	4000	3850-4050**
AQ260A/290B	260	350	1.61:1	4000	4400	4200-4450**
AQ290A/290B	290	350	1.61:1	DO NOT RUN ON DYNO		

THE ENGINE RPM'S HAVE BEEN UPDATED
AND THE PREVIOUS DYNO PRESSURES
WILL NOT CORRESPOND TO THE NEW ENGINE SPEEDS.
THIS CHART HAS BEEN ESTIMATED SO THAT YOU MAY
HAVE NUMBERS TO USE AS GUIDELINES.

MODEL 2000/2003
VOLVO STERN DRIVE SPECIFICATIONS

MODEL	CRANK UP	PROP/HP/KW	C.I.D.	GEAR RATIO	RPM	NEW	USED
AQ125B/270D	117		130	2.15:1	4600	2450	2300-2500
AQ125B/270D	120		140	2.15:1	4600	2500	2350-2550
*WAS AQ131A							
NOW: 230/SP	120	110/81	141	2.15:1	5000	2200	2050-2250
AQ145A/290D	138		140	2.15:1	4600	2675	2500-2700
AQ145B/290D	138		141	2.15:1	4600	2675	2500-2700
*WAS AQ151A							
NOW: 250/SP	146	135/99	152	2.15:1	5000	2500	2350-2550
	170		182	1.89:1	5000	2550	2375-2600
*WAS AQ171							
NOW: 251/SP	167	150/110	152	2.15:1	5700	2200	2025-2250
AQ200D/290B	200		305	1.61:1	4400	3000	2775-3050
430	175	155/114	262	1.89:1	4800	2650	2450-2750
432		164/?	262	1.89:1	4800		
*WAS AQ205							
NOW: 431/SP	205	180/132	262	1.61:1	4800	2900	2675-2950
434		187/?	262	1.89:1	4800		
*WAS AQ211							
NOW: 500/SP	210	190/140	305	1.61:1	4400	3075	2825-3100
AQ225D/290B	225		305	1.61:1	4400	3250	3025-3300
*WAS AQ231							
NOW: 501/SP	229	205/151	305	1.61:1	4600	3325	3075-3375
AQ231/175	229		305	2.15:1	DO NO	RUN	ON DYNO
AQ260A/290B	260		350	1.61:1	4400	3950	3600-4000
AQ271/290	270		350	1.61:1	DO NO	RUN	ON DYNO
AQ290A/290B	290		350	1.61:1	DO NO	RUN	ON DYNO
AQ311/290	307		350	1.61:1	DO NO	RUN	ON DYNO

NOTE**

PLEASE TELEPHONE US TOLL FREE IF YOU FEEL
THESE READINGS ARE WRONG.
** IT IS ADVISABLE TO RUN ONLY
A FEW MOMENTS AT PRESSURES THAT
EXCEED 4000 PSI.

MODEL 2000 PERFORMANCE GUIDELINES
FOR UNSPECIFIED ENGINES

YEAR	MODEL	C.I.D.	GEAR RATIO	RPM	NEW	USED