SERVICE CLASSIFICATION DEFINITIONS

Pleasure Craft
Up to 500 hours / year, low load factor usage planing hull vessels where typical full engine throttle operation is less than 10% of total time. The balance of operation at 80% of full engine throttle or less. Marine Gears for use in long range pleasure cruisers, sportfish charter boats/ patrol boats fishing boats do not qualify for pleasure Craft Service.

Intermediate Duty
Hour usage of up to 3000 hours / year (for models larger than MGX193) with 50% of the operating time at full engine rating.

Typical applications include planing hull vessels such as ferries, fishing boats, some crew boats, and also some displacement hull yachts as well as some bow and stern thruster applications.

Continuous Duty
Commonly called "Workboat Duty," these Marine Gear applications are expected to operate continuously at full engine governed speed. The propulsion engine power setting must be known and must be within the Marine Gear's allowable input rating for continuous daylong or around-the-clock service.
Most displacement hull vessels are powered for Continuous Duty service. However, the actual engine (and Marine Gear) power loading depends on:

a. The propeller used
b. The vessel's work assignment
c. The captain's choice of throttle setting during continuous service

Hitachi Nico Transmission Co., Ltd. (HNT) recommends that all displacement and semidisplacement hull commercial applications be classed as Continuous Duty usage of the Marine Gear.
Examples: Fishing trawlers, Purse seiners
Lobster boats and crab boats
Tugs, Tow boats, Buoy tenders
Offshore crew/supply boats, Ferries
Research vessels, Ocean freighters

IIMPORTANT APPLICATION INFORMATION

- Transmission ratings are based on use of the transmission in a torsionally compatible system utilizing suitable input torsional coupling.
- Ratings are for diesel engines at the indicated speeds unless otherwise limited.
- Consult factory for ratings applicable to gasoline engines or gas turbines or for all other applications not conforming to the given service classification definitions.
- Ratings apply to right hand engines, i.e., counterclockwise flywheel rotation when viewing rear of engine
- The power transmission capacity of the forward and reverse components is the same. However, helical directions of gear for starboard and port unit on some models will be changed.

IMPORTANT NOTICE : Torsional vibration analysis is required and can be made by the engine manufacturer and independent consultants. HNT is prepared to assist the analysis in relation to the transmissions. Hitachi Nico Transmission Co., Ltd. advises users of these products that their safe operation depends on use in compliance with technical information provided in the product manuals.Proper installation, operation and periodical inspection and maintenance are prerequisite for safe operation of these products. It is the responsibility of users to provide and install safety devices, which may be required by recognized safety standards.

Hitachi Nico Transmission Co., Ltd.

Pleasure Craft Marine Gear Ratings

Model MGX Series (Vertical Offset Type)

Model	SAE Hsg.	Standard Ratios	Input Rating						Max. Speed
			2100 min^{-1}		2300 min^{-1}		2500 min^{-1}		
			kW	HP	kW	HP	kW	HP	min^{-1}
MGX 193	1	0.93, 1.02, 1.12, 1.50, 1.74, 2.04	619	830	673	900	716	960	3000
		2.54	619	830	673	900	716	960	
		3.00	528	708	578	775	629	843	
MGX 202	0, 1	1.00, 1.28, 1.48, 1.73, 2.04	817	1096	895	1200	973	1305	2800
		2.57	734	984	820	1100	890	1149	
		2.90	668	896	746	1000	810	1086	
MGX 242	0, 1	1.20, 1.33, 1.48, 1.75, 1.96	949	1273	1007	1350	1064	1427	2500
		2.50	841	1128	916	1228	978	1311	
MGX 281	0, 1	1.20, 1.33, 1.48, 1.75, 1.96	1049	1407	1120	1502	1190	1596	2500
			1900 min^{-1}		2100 min^{-1}		2300 min^{-1}		
MGX 293B	0, 1	1.07, 1.50, 1.66, 1.74, 1.97, 2.04	1200	1608	1326	1777	1452	1946	2500
		2.45	1109	1486	1226	1643	1343	1800	
		2.82	955	1280	1056	1415	1156	1549	
MGX 294B	0, 1	2.46, 3.03	1208	1619	1335	1789	1462	1959	2500
		3.48	1208	1619	1335	1789	1462	1959	
		3.93	1099	1473	1214	1627	1330	1782	
		4.43	968	1297	1070	1434	1172	1570	
MGX 353B	0	1.15, 1.33, 1.53, 1.73	1294	1734	1430	1916	1566	2098	2500
		2.03	1294	1734	1430	1916	1566	2098	
		2.32	1294	1734	1430	1916	1566	2098	
		2.44	1294	1734	1430	1916	1566	2098	
		2.72	1214	1627	1342	1798	1470	1970	

Hitachi Nico Transmission Co., Ltd.

Pleasure Craft Marine Gear Ratings

Model MGXV Series (Down Angle Type)

Model	SAE Hsg.	Standard Ratios	Input Rating						Max. Speed
			2100 min^{-1}		2300 min^{-1}		2500 min^{-1}		
			kW	HP	kW	HP	kW	HP	min^{-1}
MGXV 192	1	1.03, 1.20, 1.48, 1.75, 1.92, 2.04	619	830	673	900	701	940	3000
		2.50	619	830	673	900	701	940	
MGXV 192C	---	1.03, 1.20, 1.48, 1.75, 1.92, 2.04	619	830	673	900	701	940	2800
		2.50	619	830	673	900	701	940	
MGXV 202	0, 1	1.10, 1.25, 1.53, 1.79, 2.00	817	1096	895	1200	973	1305	2500
		2.52	734	1097	820	1100	890	1149	
MGXV 202C	---	1.10, 1.25, 1.53, 1.79, 2.00	817	1096	895	1200	973	1305	2500
		2.52	734	1097	820	1100	890	1149	
MGXV 242	0, 1	1.26, 1.48, 1.75, 1.96	949	1273	1007	1350	1064	1427	2500
		2.50	878	1177	956	1282	1020	1368	
MGXV 242C	---	1.26, 1.48, 1.75, 1.96	949	1273	1007	1350	1064	1427	2500
		2.50	878	1177	956	1282	1020	1368	
MGXV 281	0, 1	1.26, 1.48, 1.75, 1.96	1049	1407	1120	1502	1190	1596	2500
MGXV 281C	---	1.26, 1.48, 1.75, 1.96	1049	1407	1120	1502	1190	1596	2500
			1900 min^{-1}		2100 min^{-1}		2300 min^{-1}		
MGXV 293B	0, 1	1.29	1112	1490	1229	1647	1346	1804	2500
		1.51	1082	1450	1196	1603	1310	1755	
		1.74	1158	1552	1281	1717	1403	1880	
		2.03	1158	1552	1242	1664	1323	1773	
		2.48	1082	1450	1196	1603	1310	1755	
		2.80	954	1278	1055	1414	1156	1549	
MGXV 293BC	---	1.29, 1.51, 1.74, 2.03, 2.48	1082	1450	1196	1603	1310	1755	2500
		2.80	954	1278	1055	1414	1156	1549	
MGXV 353B	0	1.55, 1.72, 2.09, 2.42	1294	1734	1430	1916	1566	2098	2500
		2.73	1229	1647	1358	1820	1487	1993	
MGXV 353BC	---	1.55, 1.72, 2.09, 2.42	1294	1734	1430	1916	1566	2098	2500
		2.73	1229	1647	1358	1820	1461	1958	

Hitachi Nico Transmission Co., Ltd.

Intermediate Duty Marine Gear Ratings

Model MGX Series (Vertical Offset Type)

Model	SAE Hsg.	Standard Ratios	Input Rating						Max. Speed
			1900 min^{-1}		2100 min^{-1}		2300 min^{-1}		
			kW	HP	kW	HP	kW	HP	min^{-1}
MGX 193	1	0.93, 1.02, 1.12, 1.50, 1.74, 2.04	466	625	503	675	552	740	3000
		2.54	429	575	466	625	507	680	
		3.00	408	547	451	605	492	660	
MGX 202	0, 1	1.00, 1.28, 1.48, 1.73, 2.04	540	724	560	851	600	805	2800
		2.57	540	724	560	751	600	805	
		2.90	504	676	522	700	560	751	
MGX 242	0, 1	1.20, 1.33, 1.48, 1.75, 1.96	726	974	746	1000	836	1121	2500
		2.50	614	823	671	900	726	974	
MGX 281	0, 1	1.20, 1.33, 1.48, 1.75, 1.96	781	1051	806	1081	903	1211	2500
			1800 min^{-1}		1900 min^{-1}		2100 min^{-1}		
MGX 293B	0, 1	1.07, 1.50, 1.66, 1.74, 1.97, 2.04	841	1127	875	1173	942	1262	2500
		2.45	812	1088	857	1148	937	1256	
		2.82	701	939	740	992	818	1096	
MGX 294B	0, 1	2.46, 3.03	882	1182	925	1240	1000	1340	2500
		3.48	849	1138	882	1182	945	1266	
		3.93	774	1037	804	1077	861	1154	
		4.43	722	967	750	1005	804	1077	
MGX 353B	0	1.15, 1.33, 1.53, 1.73	1047	1403	1087	1457	1166	1562	2500
		2.03	1025	1374	1142	1530	1142	1530	
		2.32	1019	1365	1136	1522	1136	1522	
		2.44	987	1323	1100	1474	1100	1474	
		2.72	915	1226	1019	1365	1019	1365	

Hitachi Nico Transmission Co., Ltd.

Intermediate Duty Marine Gear Ratings

Model MGXV Series (Down Angle Type)

Model	SAE Hsg.	Standard Ratios	Input Rating						Max. Speed
			1900 min^{-1}		2100 min^{-1}		2300 min^{-1}		
			kW	HP	kW	HP	kW	HP	min^{-1}
MGXV 192	1	1.03, 1.20, 1.48, 1.75, 1.92, 2.04	424	568	466	625	503	675	3000
		2.50	367	492	400	536	433	580	
MGXV 192C	---	1.03, 1.20, 1.48, 1.75, 1.92, 2.04	424	568	466	625	503	675	2800
		2.50	367	492	400	536	433	580	
MGXV 202	0, 1	1.10, 1.25, 1.53, 1.79, 2.00	540	724	560	751	600	805	2500
		2.52	540	724	560	751	600	805	
MGXV 202C	---	1.10, 1.25, 1.53, 1.79, 2.00	540	724	560	751	600	805	2500
		2.52	540	724	560	751	600	805	
MGXV 242	0, 1	1.26, 1.48, 1.75, 1.96	726	974	746	1000	836	1121	2500
		2.50	614	823	671	900	726	974	
MGXV 242C	---	1.26, 1.48, 1.75, 1.96	726	974	746	1000	836	1121	2500
		2.50	614	823	671	900	726	974	
MGXV 281	0, 1	1.26, 1.48, 1.75, 1.96	784	1051	806	1081	903	1211	2500
MGXV 281C	---	1.26, 1.48, 1.75, 1.96	784	1051	806	1081	903	1211	2500
			1800 min^{-1}		1900 min^{-1}		2100 min^{-1}		
MGXV 293B	0, 1	1.29, 1.51, 1.74	894	1198	929	1245	996	1335	2500
		2.03, 2.48	765	1025	853	1143	909	1218	
		2.80	754	1010	840	1126	895	1199	
MGXV 293BC	---	1.29, 1.51, 1.74	894	1198	929	1245	996	1335	2500
		2.03, 2.48	765	1025	795	1065	853	1143	
		2.80	754	1010	783	1049	840	1126	
MGXV 353B	0	1.55, 1.72, 2.09	1103	1478	1165	1561	1287	1725	2500
		2.42	979	1312	1018	1364	1091	1462	
		2.73	870	1166	904	1211	970	1300	
MGXV 353BC	---	1.55	1024	1372	1064	1426	1141	1529	2500
		1.72	990	1327	1029	1379	1104	1479	
		2.09	944	1250	981	1315	1052	1410	
		2.42	907	1215	942	1262	1011	1355	
		2.73	822	1101	854	1144	916	1227	

Hitachi Nico Transmission Co., Ltd.

Continuous Duty Marine Gear Ratings

Model MGX Series (Vertical Offset Type)

Model	SAE Hsg.	Standard Ratios	Input Rating						Max. Speed
			1800 min^{-1}		2100 min^{-1}		2400 min^{-1}		
			kW	HP	kW	HP	kW	HP	min^{-1}
MGX 193	1	0.93, 1.02, 1.12, 1.50, 1.74, 2.04	358	480	410	550	460	617	3000
		2.54	358	480	410	550	460	617	
		3.00	328	440	372	500	418	561	
			1200 min^{-1}		1600 min^{-1}		1800 min^{-1}		
MGX 202	1, 0	1.00, 1.28, 1.48, 1.73, 2.04	308	413	410	550	445	597	2800
		2.57	308	413	410	550	445	597	
		2.90	282	378	376	504	408	547	
MGX 242	1, 0	1.20, 1.33, 1.48, 1.75, 1.96	391	524	522	700	552	740	2500
		2.50	331	444	442	593	485	650	
MGX 281	1, 0	1.20, 1.33, 1.48, 1.75, 1.96	362	485	565	758	612	821	2500
MGX 293B	0, 1	1.07, 1.50, 1.66, 1.74, 1.97, 2.04	552	740	670	898	728	976	2500
		2.45	514	689	670	898	728	976	
		2.82	443	594	591	792	664	890	
MGX 294B	0, 1	2.46, 3.03	580	777	710	951	771	1033	2500
		3.48	549	736	670	898	729	977	
		3.93	500	670	611	819	664	890	
		4.43	466	624	570	764	619	829	
MGX 353B	0	1.15, 1.33, 1.53, 1.73	658	882	827	1108	898	1203	2500
		2.03	658	882	810	1085	879	1178	
		2.32	658	882	805	1079	874	1171	
		2.44	638	855	780	1045	847	1135	
		2.72	591	792	723	969	785	1052	

Hitachi Nico Transmission Co., Ltd.

Continuous Duty Marine Gear Ratings

Model MGXV Series (Down Angle Type)

Model	SAE Hsg.	Standard Ratios	Input Rating						Max. Speed
			1800 min^{-1}		2100 min^{-1}		2400 min^{-1}		
			kW	HP	kW	HP	kW	HP	min^{-1}
MGXV 192	1	1.03, 1.20, 1.48, 1.75, 1.92, 2.04	347	465	387	519	435	583	3000
		2.50	321	430	365	490	411	551	
			1200 min^{-1}		1600 min^{-1}		1800 min^{-1}		
MGXV 202	1, 0	1.10, 1.25, 1.53, 1.79, 2.00	308	413	410	550	445	597	2500
		2.52	308	413	410	550	445	597	
MGXV 242	1, 0	1.26, 1.48, 1.75, 1.96	391	524	522	700	552	740	2500
		2.50	331	444	442	593	485	650	
MGXV 281	1, 0	1.26, 1.48, 1.75, 1.96	362	485	565	758	612	821	2500
MGXV 293B	0, 1	1.29, 1.51, 1.74	579	776	706	946	767	1028	2500
		2.03, 2.48	495	663	604	809	656	879	
		2.80	488	654	595	797	647	867	
MGXV 293BC	---	1.29, 1.51, 1.74	579	776	706	946	767	1028	2500
		2.03, 2.48	495	663	604	809	656	879	
		2.80	488	654	595	797	647	867	
MGXV 353B	0	1.55, 1.72, 2.09	694	930	918	1230	1007	1349	2500
		2.42	633	848	774	1037	840	1126	
		2.73	563	754	688	922	747	1001	
MGXV 353BC	---	1.55	663	888	809	1084	878	1177	2500
		1.72	641	859	782	1048	850	1139	
		2.09	611	819	745	998	810	1085	
		2.42	587	787	716	959	778	1043	
		2.73	532	713	649	870	705	945	

Hitachi Nico Transmission Co., Ltd.

Model MGX Series

Dimensional Data

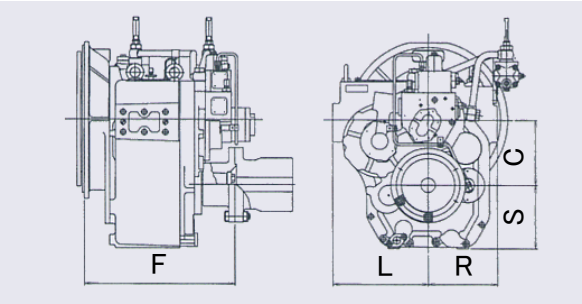

Fig. B

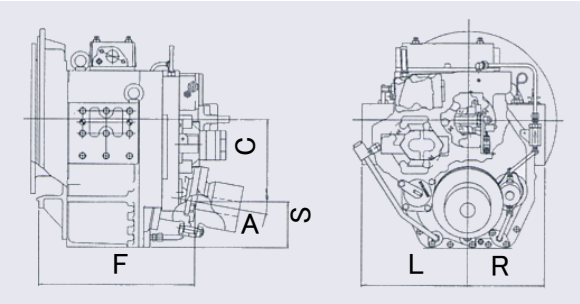

Fig. E

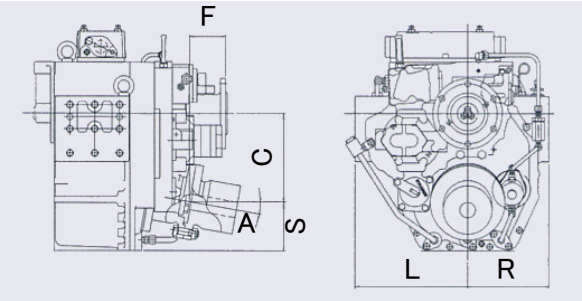

Fig. F

Model	SAE Hsg.	Fig.	F: length	L:mtg. pad	R:mtg. pad	C: offset	S: sump	A:	Mass (approx.dry)
			mm	mm	mm	mm	mm	deg.	kg
MGX 193	1	B	483	279	191	190	161	---	203
MGX 202	0, 1	B	535	305	305	200	190	---	300
MGX 242	0, 1	B	535	305	305	206	179	---	325
MGX 281	0, 1	B	535	305	305	206	179	---	325
MGX 293B	0, 1	B	592	340	340	220	235	---	460
MGX 294B	0, 1	B	602.5	360	360	310	275	---	580
MGX 353B	0	B	698	340	340	235	235	---	560
MGXV 192	1	E	479	279	203	203	133	7	206
MGXV 192C	---	F	64	279	203	203	133	7	198
MGXV 202	0, 1	E	520	305	305	231	160	10	280
MGXV 202C	---	F	94	305	305	231	160	10	258
MGXV 242	0, 1	E	516	305	305	264	156	10	333
MGXV 242C	---	F	125	305	305	264	156	10	295
MGXV 281	0, 1	E	516	305	305	231	156	10	333
MGXV 281C	---	F	125	305	305	231	156	10	295
MGXV 293B	0, 1	E	574	340	340	297.3	158.7	10	460
MGXV 293BC	---	F	202	340	340	297.3	158.1	10	450
MGXV 353B	0	E	653	340	340	315.9	184.1	10	565
MGXV 353BC	---	F	167	340	340	315.9	184.1	10	545

Comments
- **Dimensions may vary with housing adapter or output flange size.**
- **Dry mass is approximate and does not include companion flange.**
- **Specifications subject to change.**