McCULLOCH

SERVICE BULLETIN #1190

MODEL ALL

DATE 8/22/62

SUBJECT CYLINDER, PISTON AND RING CHART.

NOTE: This Bulletin Replaces S/B #1054 and #1127

Many of the McCulloch chain saws and kart engines, having given long and satisfactory service, are now being rebored, honed and fitted with an oversize piston and rings. This is especially true concerning the earlier chain saw and kart engine models. Installation of oversize piston and rings in a rebored cylinder will restore much of the engine's original power, provide a longer working life and in many cases eliminate other costly repairs.

Principal conditions which should govern the decision to rebore and re-ring are . . .

. . . If taper or out of round condition exceeds 0.005 inch.
. . . if cylinder is scored, scratched, pitted or scuffed.
. . . if ports are pounded.
. . . if new rings won't seal and engine lacks power (even though taper is less than 0.005").
. . . if piston-to-cylinder clearance exceeds the high limit by 0.005 inch (0.007-inch in kart engines).

When reboring cylinders, the oversize dimensions should be measured in even steps of 0.010 inch (0.010, 0.020, 0.030 inch) over the standard bore diameter of new engines. If the correct oversize dimension is not held, possible interference or a tight fit will exist between the piston and the cylinder wall. In chain saw engines the piston-to-cylinder clearance is 0.0025 to 0.005 inch. In kart engines, because of higher temperatures resulting from high speed running, it is desirable to have the greater piston-to-cylinder clearance of 0.005 to 0.007 inch. This is particularly true when thin ring pistons are used.

When reboring and/or honing requires the removal of more than 0.010 inch of metal (but less than 0.020 inch) from the cylinder to remove scuff or other marks, it will be necessary to continue the boring and honing operation until the 0.020-inch oversize is reached. Having done this, 0.020-inch oversize pistons and rings must be used. In a like manner, if more than 0.020 inch of metal is removed to clean up the cylinder marks, the cylinder will have to be bored and honed for 0.030-inch oversize piston and rings. If the cylinder is bored to an in-between size, the correct piston-to-cylinder wall clearance cannot be obtained with a stock oversize piston.

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Maximum taper or out-of-round permitted after reboring or rehoning is 0.0007 inch. (Engines can be operated until taper has increased to 0.005 inch before reboring or rehoning will be necessary.)

Dimensional tolerance factor for the cylinders is 0.001-inch and is incorporated in the chart data.

See 1190A

Correct end-gap for piston rings in chain saw engines is 0.004 to 0.012 inch. In kart engines using the thin rings, this end gap is 0.004 to 0.050 inch. End gap may be checked by pushing a ring halfway down in a new or rebored cylinder and using a feeler gauge to measure the gap between the ring ends.

As a guide, a chart of dimensions, sizes and part numbers of pistons and piston rings for McCulloch engines has been compiled and will be found on the following pages.

NOTE: TO CHANGE DIMENSIONS GIVEN IN THIS BULLETIN AND CHART TO THEIR METRIC EQUIVALENTS, MULTIPLY THE DIMENSIONS BY THE FACTOR OF 25.4 TO OBTAIN MILLIMETERS. TO CHANGE THEM TO CENTIMETERS USE THE FACTOR OF 2.54.

PISTONS AND RINGS

DIMENSIONS AND PART NUMBERS

Model	Size and Oversize	Piston Assembly Number	Piston Top Dimension	Piston Skirt Dimension	Cylinder Assembly Number	Cylinder Interior Dimension	Ring Set
3-25	Standard	19931A	1.9912/1.9907	1.9953/1.9948	19021	1.9980/1.9970	51747
47	0.010 OS	19910C	2.0012/2.0007	2.0053/2.0048			51748
	0.020 OS	19920C	2.0112/2.0107	2.0153/2.0148			51749
	0.030 OS	19907B	2.0212/2.0207	2.0253/2.0248			51750
33	Standard	52379	1.7475/1.7470	1.7495/1.7490	52224	1.7535/1.7525	52046
33B 35	0.010 OS	52380	1.7575/1.7570	1.7595/1.7590			52047
MAC35	0.020 OS	52382	1.7675/1.7670	1.7695/1.7690			52048
MAC35A		52384	1.7775/1.7770	1.7795/1.7790			52049
S-33	Standard	36616C	1.7475/1.7470	1.7495/1.7490	52328	1.7535/1.7525	52046
	0.010 OS	36663C	1.7575/1.7570	1.7595/1.7590			52047
	0.020 OS	36664C	1.7675/1.7670	1.7695/1.7690			52048
	0.030 OS	36665C	1.7775/1.7770	1.7795/1.7790			52049

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Model	Size and Oversize	Piston Assembly Number	Piston Top Dimension	Piston Skirt Dimension	Cylinder Assembly Number	Cylinder Interior Dimension	Ring Set
4-30	Standard	28353A	2.1220/2.1215	2.1240/2.1235	28260	2.1285/2.1275	28886
4-30A	0.010 OS	28244C	2.1320/2.1315	2.1340/2.1335			28887
49	0.020 OS	28247C	2.1420/2.1415	2.1440/2.1435			28888
	0.030 OS	28250C	2.1520/2.1515	2.1540/2.1535			28889
39	Standard	52045	1.7475/1.7470	1.7495/1.7490	52328	1.7535/1.7525	52046
	0.010 OS	52051	1.7575/1.7570	1.7595/1.7590			52047
	0.020 OS	52052	1.7675/1.7670	1.7695/1.7690			52048
	0.030 OS	52053	1.7775/1.7770	1.7795/1.7790			52049
D-44	Standard	51210B	1.9955/1.9950	1.9975/1.9970	55443	2.001/2.000	51747
55	0.010 OS	51451B	2.0055/2.0050	2.0075/2.0070			51748
	0.020 OS	51452B	2.0155/2.0150	2.0175/2.0170			51749
	0.030 OS	51453B	2.0255/2.0250	2.0275/2.0270			51750
S-44	Standard	55007A	2.1200/2.1195	2.1220/2.1215	55441	2.1260/2.1250	55123
S-55	0.010 OS	55057A	2.1300/2.1295	2.1320/2.1315			55124
	0.020 OS	55058A	2.1400/2.1395	2.1420/2.1415			55125
	0.030 OS	55059A	2.1500/2.1495	2.1520/2.1515			55126
5-49	Standard	38037	2.2425/2.2415	2.2455/2.2445	18405A	2.2450/2.2440	38043
	.010	obsolete	-	-			-
	.020	38039	2.2625/2.2615	2.2655/2.2645			38045
	.030	38040	2.2725/2.2715	2.2755/2.2745			38046
7-55	Standard	24775	2.4925/2.4920	2.4970/2.4965	24023A	2.5035/2.5025	28809
	.010	24776	2.5025/2.5020	2.5070/2.5065			28810
	.020	24777A	2.5125/2.5120	2.5170/2.5165			28811
	.030	24778A	2.5225/2.5220	2.5270/2.5265			28812
S-44A	Standard	55310A	2.1190/2.1184	2.1220/2.1213	55438A	2.1260/2.1250	55123
S-55A	0.010 OS	55322A	2.1290/2.1284	2.1320/2.1313			55124
1-70	0.020 OS	55323A	2.1390/2.1384	2.1420/2.1413			55125
1-80	0.030 OS	55324A	2.1490/2.1484	2.1520/2.1513			55126

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Model	Size and Oversize	Piston Assembly Number	Piston Top Dimension	Piston Skirt Dimension	Cylinder Assembly Number	Cylinder Interior Dimension	Ring Set
1-40	Standard	50206	2.1200/2.1195	2.1220/2.1215	50737	2.1260/2.1250	55123
D-30	0.010 OS	-	-	-			
	0.020 OS	50134	2.1400/2.1395	2.1420/2.1415			55125
	0.030 OS	-	-	-			
1-50	Standard	55007A	2.1200/2.1195	2.1220/2.1215	50737	2.1260/2.1250	55123
1-60	.010	55057A	2.1300/2.1295	2.1320/2.1315			55124
D-36	.020	55058A	2.1400/2.1395	2.1420/2.1415			55125
	.030	55059A	2.1500/2.1495	2.1520/2.1515			55126
73	Standard	47580	2.4950/2.4945	2.4975/2.4970	28779	2.5035/2.5025	28809
77	.010	47589	2.5050/2.5045	2.5075/2.5070			28810
	.020	47590	2.5150/2.5145	2.5175/2.5170			28811
	.030	47591	2.5250/2.5245	2.5275/2.5270			28812
99	Standard	24754B	2.4924/2.4919	2.4970/2.4965	24023A	2.5035/2.5025	24796A
	.010	24681B	2.5024/2.5019	2.5070/2.5065			24797A
	.020	24684B	2.5124/2.5119	2.5170/2.5165			24798A
	.030	24687B	2.5224/2.5219	2.5270/2.5265			24799A
1-41	Standard	50206	2.1200/2.1195	2.1220/2.1215	57409A	2.1260/2.1250	55123
1-42	.010						55124
1-43	.020	50134	2.1400/2.1395	2.1420/2.1415			55125
	.030						55126
1-51	Standard	55007A	2.1200/2.1195	2.1220/2.1215	53528	2.1260/2.1250	55123
1-61	.010	55057A	2.1300/2.1295	2.1320/2.1315			55124
1-62	.020	55058A	2.1400/2.1395	2.1420/2.1415			55125
	.030	55059A	2.1500/2.1495	2.1520/2.1515			55126
1-71	Standard	55310A	2.1190/2.1184	2.1220/2.1213	55557	2.1260/2.1250	55123
1-81	.010	55322A	2.1290/2.1184	2.1320/2.1313			55124
	.020	55323A	2.1390/2.1384	2.1420/2.1413			55125
	.030	55324A	2.1490/2.1484	2.1520/2.1513			55126

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Model	Size and Oversize	Piston Assembly Number	Piston Top Dimension	Piston Skirt Dimension	Cylinder Assembly Number	Cylinder Interior Dimension	Ring Set
1-81HD (Thin Rings)	Standard	48695	2.1190/2.1184	2.1220/2.1214	55557	2.1260/2.1250	48691
	.010	48684	2.1290/2.1284	2.1320/2.1314			48692
	.020	48685	2.1390/2.1384	2.1420/2.1414			48693
	.030	48686	2.1490/2.1484	2.1520/2.1514			48694
1-52	Standard	55310A	2.1190/2.1184	2.1220/2.1213	57965	2.1260/2.1250	55123
1-53	.010	55322A	2.1290/2.1284	2.1320/2.1313			55124
	.020	55323A	2.1390/2.1384	2.1420/2.1413			55125
	.030	55324A	2.1490/2.1484	2.1520/2.1513			55126
1-72	Standard	48695	2.1190/2.1184	2.1220/2.1214	57894	2.1260/2.1250	48691
1-82	.010	48684	2.1290/2.1284	2.1320/2.1314			48692
	.020	48685	2.1390/2.1384	2.1420/2.1414			48693
	.030	48686	2.1490/2.1484	2.1520/2.1514			48694
1-92	Standard	58356	2.2115/2.2109	2.2145/2.2139	58162A	2.2190/2.2180	58353
	.010	58390	2.2215/2.2209	2.2245/2.2239			58394
	.020	58355	2.2315/2.2309	2.2345/2.2339			58354
	.030	58391	2.2415/2.2409	2.2445/2.2439			58395
1-45	Standard	48695	2.1190/2.1184	2.1220/2.1214	57409A	2.1260/2.1250	48691
1-46	.010	48684	2.1290/2.1284	2.1320/2.1314			48692
	.020	48685	2.1390/2.1384	2.1420/2.1414			48693
	.030	48686	2.1490/2.1484	2.1520/2.1514			48694
1-75	Standard	48904A	2.1170/2.1164	2.1200/2.1194	57962	2.1260/2.1250	48691
1-85	.010	48927	2.1270/2.1264	2.1300/2.1294			48692
	.020	48928	2.1370/2.1364	2.1400/2.1394			48693
	.030	48929	2.1470/2.1464	2.1500/2.1494			48694
1-76	Standard	59582	2.1570/2.1564	2.1600/2.1594	59564	2.1640/2.1630	48978
1-86	.010	59583	2.1670/2.1664	2.1700/2.1694			48934
	.020	59584	2.1770/2.1764	2.1800/2.1794			59587
	.030	59585	2.1870/2.1864	2.1900/2.1894			59586

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Model	Size and Oversize	Piston Assembly Number	Piston Top Dimension	Piston Skirt Dimension	Cylinder Assembly Number	Cylinder Interior Dimension	Ring Set
1-63	Standard	55007A	2.1200/2.1195	2.1220/2.1215	53528	2.1260/2.1250	55123
	.010	55057A	2.1300/2.1295	2.1320/2.1315			55124
	.020	55058A	2.1400/2.1395	2.1420/2.1415			55125
	.030	55059A	2.1500/2.1495	2.1520/2.1515			55126
1-93	Standard	58356	2.2115/2.2109	2.2145/2.2139	58551	2.2190/2.2180	58553
	.010	58390	2.2215/2.2209	2.2245/2.2239			58394
	.020	58355	2.2315/2.2309	2.2345/2.2339			58354
	.030	58391	2.2415/2.2409	2.2445/2.2439			58395
BP-1 (Power Piston)	Standard	59501A	1.7440/1.7435	1.7470/1.7465	59608	1.7510/1.7500	59294
	.010	59086A	1.7540/1.7535	1.7570/1.7565	(Two parts)		59295
	.020	59087A	1.7640/1.7635	1.7670/1.7665			59296
	.030	59088A	1.7740/1.7735	1.7770/1.7765			59297
BP-1 (Balance Piston)	No oversize	59043	1.1435/1.1430		59029 (Removable Sleeve)	1.1250/1.1150	No Rings
MC-1	Standard	48980	2.1190/2.1185	2.1220/2.1215	48946	2.1260/2.1250	48691
							48692
							48693
							48694
MC-2	Standard	48518	2.1570/2.1564	2.1600/2.1594	47661	2.1660/2.1650	48978
	.010	48931	2.1670/2.1664	2.1700/2.1694			48934
MC-5 (Wide Ring)	Standard	55007A	2.1200/2.1195	2.1220/2.1215	48701	2.1260/2.1250	55123
	.010	55057A	2.1300/2.1295	2.1320/2.1315			55124
	.020	55058A	2.1400/2.1395	2.1420/2.1415			55125
	.030	55059A	2.1500/2.1495	2.1520/2.1515			55126
MC-5	Standard	48844	2.1170/2.1165	2.1200/2.1195	48701	2.1260/2.1250	48691
MC-6 (Thin Ring)	.010	48845	2.1270/2.1265	2.1300/2.1295			48692
	.020	48846	2.1370/2.1365	2.1400/2.1395			48693
	.030	48847	2.1470/2.1465	2.1500/2.1495			48694

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Model	Size and Oversize	Piston Assembly Number	Piston Top Dimension	Piston Skirt Dimension	Cylinder Assembly Number	Cylinder Interior Dimension	Ring Set
MC-7	Standard	48518	2.1570/2.1564	2.1600/2.1594	48993	2.1660/2.1650	48978
	.010	48931	2.1670/2.1664	2.1700/2.1694			48934
MC-10 (Wide Ring)	Standard	55310A	2.1190/2.1184	2.1220/2.1213	48612A	2.1260/2.1250	55123
	.010	55322A	2.1290/2.1284	2.1320/2.1313			55124
	.020	55323A	2.1390/2.1384	2.1420/2.1413			55125
	.030	55324A	2.1490/2.1484	2.1520/2.1513			55126
MC-10 (Thin Ring)	Standard	48844	2.1170/2.1165	2.1200/2.1195	48612A	2.1260/2.1250	48691
	.010	48845	2.1270/2.1265	2.1300/2.1295			48692
	.020	48846	2.1370/2.1365	2.1400/2.1395			48693
	.030	48847	2.1470/2.1465	2.1500/2.1495			48694
MC-10 Power Kit (Thin Ring)	Standard	48832	2.1170/2.1165	2.1200/2.1195	48612A	2.1260/2.1250	48691
	.010	48833	2.1270/2.1265	2.1300/2.1295			48692
	.020	48834	2.1370/2.1365	2.1400/2.1395			48693
	.030	48835	2.1470/2.1465	2.1500/2.1495			48694
MC-20	Standard	48904A	2.1170/2.1164	2.1200/2.1194	48871	2.1260/2.1250	48691
	.010	48927	2.1270/2.1264	2.1300/2.1294			48692
	.020	48928	2.1370/2.1364	2.1400/2.1394			48693
	.030	48929	2.1470/2.1464	2.1500/2.1494			48694
	.040	48518	2.1570/2.1564	2.1600/2.1594			48978
	.050	48931	2.1670/2.1664	2.1700/2.1694			48934
MC-30	Standard	48518	2.1570/2.1564	2.1600/2.1594	48992	2.1660/2.1650	48978
	.010	48931	2.1670/2.1664	2.1700/2.1694			48934