

Woodward PMG and Speed Switches

Support Services and Spare Parts

Services Available

- **Overhauls performed at our facility:** Unit down for maintenance? Ship us the PMG and we can perform routine maintenance in our shop.
- **Short turn-around times are supported.**
- **On-site inspection and overhaul:** As part of our field service, we can perform an overhaul along with gate shaft and mechanical cabinet maintenance.

Overhaul Guidelines

Speed Switches:

- Every 6 Months: Lubricate and inspect for wear.
- Every 12 Months: Verify proper operating range of all switches.
- Every 24 Months: Overhaul all speed switches. Change components as required.
- Every 60 Months: Change all speed switch bearings.

Emerson offers a complete line of standard replacement parts for PMGs and speed switches. In addition, we have access to hard to find castings and other components.



Reference Number	Description	Part Number
Woodward Combination Speed Switch		
09023-39	Bearing assembly	8936-018
09023-39A	Bearing – Special and Lubricated	180229
09023-39B	Bearing shield washer (plain)	1013-278
09023-39C	Bearing shield washer (stepped)	111290
09023-40	Snap ring	190612
09023-43	Drive gear – steel or micarta	Call – special
09023-44	Locking washer	190199
09023-45	Retaining nut	190427
09023-46	Pinion gear – speed switch drive	See gear list
09023-47	4/0 – 1 5/16" taper pin (obsolete)	1005-752
09023-47	1/8" x 1 1/8" Roll Pin	1005-752
09023-52	Bearing lockwasher	188011
09023-53	Bearing locknut	188523
09023-58	Speed switch bracket	3404-036
09023-63	Flyweight head – special before 1987	110817
09023-63	Flyweight head – double spring before 1987	110989
09023-63	Flyweight head – special double spring before 1987	4508-021
09023-63	Flyweight head – standard after 1987	4508-088
09023-63	Flyweight head – standard before 1987	4508-089
09023-63	Flyweight head – double spring after 1987	4508-090
09023-64	Flyweight arm pin	1004-486
09023-65	Oilite bushing	3002-526
09023-66	Flyweight arm (overspeed)	196049
09023-67	Flyweight arm (underspeed)	4500-002
09023-67	Flyweight arm (underspeed) – double spring	4500-003
09023-69	Rocker arm pin	184466
09023-70	Spring clip	3013-520
09023-71	Thrust bearing assembly	111006
09023-71A	Thrust cup	111005
09023-71B	Thrust bearing	180179
09023-72	Lower speeder rod	111207
09023-73	Lower speeder rod pin	184912
09023-74	Speed switch spring	Call – special

Reference Number	Description	Part Number
09023-75	Speed setting plug	110160
09023-76	Upper speeder rod	111208
09023-77	Upper speeder rod pin	184913
09023-78	Spring clip	3013-520
09023-79	Mercury switch	201079
09023-80	Rocker arm	111206
Woodward Permanent Magnet Generator		
11002-17	Mercury switch	201079
11002-43	Bearing locknut	188523
11002-44	Bearing lockwasher	188011
11002-45	Snap ring	218828
11002-46	Bearing – special and lubricated	180229
11002-51	4/0 - 1 5/16" taper pin (obsolete)	1005-752
11002-51	1/8" x 1 1/8" roll pin	1005-752
11002-52	Pinion gear – speed switch drive	See gear list
11002-54	Flyball arm (underspeed)	4500-002
11002-54	Flyball arm (underspeed) – double spring	4500-003
11002-57	Speed switch bracket	110164
11002-62	Ballarm pin	1004-486
11002-63	Ballhead	4508-089
11002-64	Ballarm (high speed)	196049
11002-65	Oilite bushing	3002-526
11002-66	Rocker arm pin	184466
11002-67	Spring clip	3013-520
11002-69	Thrust bearing assembly	111006
11002-69A	Thrust cup	111005
11002-69B	Thrust bearing	180179
11002-70	Lower speeder rod	111207
11002-71	Lower speeder rod pin	184912
11002-72	Speed switch spring	Call – special
11002-73	Speed setting plug	110160
11002-74	Upper speeder rod	111208
11002-75	Upper speeder rod pin	184913
11002-76	Spring clip	3013-520
11002-77	Rocker arm	111206

Reference Number	Description	Part Number
11002-80	Bearing shield washer (plain)	1013-278
11002-81	Bearing shield washer (stepped)	111290
Woodward Permanent Magnet Generator		
11004-28	Mercury switch	201079
11004-42	Bearing – special and lubricated	180229
11004-43	Bearing shield washer (plain)	1013-278
11004-44	Snap ring	190612
11004-46	Bearing lockwasher	188011
11004-47	Bearing locknut	188523
11004-55	4/0 - 1 5/16" taper pin (obsolete)	1005-752
11004-55	1/8" x 1 1/8" roll pin	1005-752
11004-56	Pinion gear – speed switch drive	See gear list
11004-57	Bearing shield washer	111290
11004-58	Speed switch bracket	4304-036
11004-62	Ballarm pin	1004-486
11004-63	Ballhead – standard after 1987	4508-088
11004-63	Ballhead – standard before 1987	4508-089
11004-63	Ballhead – double spring after 1987	4508-090
11004-63	Ballhead – double spring before 1987	110989
11004-64	Ballarm (high speed)	196049
11004-65	Oilite bushing	3002-526
11004-66	Rocker arm pin	184466
11004-67	Thrust bearing cup	111005
11004-67A	Thrust bearing	180179
11004-68	Low speed ballarm	4500-002
11004-68	Low speed ballarm – double spring	4500-003
11004-69	Thrust bearing assembly	111006
11004-72	Lower speeder rod	111207
11004-73	Lower speeder rod pin	184912
11004-74	Speed switch spring	Call – special
11004-75	Speed setting plug	110160
11004-76	Upper speeder rod	111208
11004-77	Upper speeder rod pin	184913
11004-78	Spring clip	3013-520
11004-79	Rocker arm	111206

Reference Number	Description	Part Number
Woodward Speed Signal Generator		
11006-1	Pinion gear – speed switch drive	1447-850
11006-2	4/0 – 1 5/16" taper pin (obsolete)	1005-752
11006-2	1/8" x 1 1/8" roll pin	1005-752
11006-3	Bearing locknut	188523
11006-4	Bearing lock washer	188011
11006-5	Snap ring	190612
11006-6	Bearing – special and lubricated	180229
11006-7	Bearing shield washer (plain)	1013-278
11006-8	Bearing shield washer	111290
11006-10	Speed switch bracket – standard	3404-036
11006-10	Speed switch bracket – special	3404-054
11006-12	Ballarm pin	1004-486
11006-13	Ballhead – standard after 1987	4508-088
11006-13	Ballhead – standard before 1987	4508-089
11006-13	Ballhead – double spring after 1987	4508-090
11006-13	Ballhead – double spring before 1987	110989
11006-14	Ballarm (high speed)	196049
11006-15	Low speed ballarm	4500-002
11006-15	Low speed ballarm – double spring	4500-003
11006-16	Oilite bushing	3002-526
11006-19	Rocker arm pin	184466
11006-20	Spring clip	3013-520
11006-21	Thrust bearing assembly	111006
11006-21A	Thrust bearing cup	111005
11006-21B	Thrust bearing	180179
11006-24	Lower speeder rod	111207
11006-25	Lower speeder rod pin	184912
11006-26	Speed switch spring	Call – special
11006-27	Speed setting plug	110160
11006-28	Upper speeder rod	111208
11006-29	Upper speeder rod pin	184913
11006-30	Spring clip	3013-520
11006-31	Rocker arm	111206
11006-102	Mercury switch	201079

Reference Number	Description	Part Number
Woodward Speed Signal Generator		
11007-130	Pinion gear – speed switch drive	See gear list
11007-131	1/8" x 1 1/8" roll pin	1005-752
11007-132	Bearing locknut	188523
11007-133	Bearing lockwasher	188011
11007-134	Snap ring	190612
11007-135	Bearing – special and lubricated	180229
11007-136	Bearing shield washer (plain)	1013-278
11007-137	Bearing shield washer	111290
11007-138	Speed switch bracket – standard	3404-036
11007-138	Speed switch bracket – special	3404-054
11007-142	Ballarm pin	1004-486
11007-143	Ballhead – standard after 1987	4508-088
11007-143	Ballhead – standard before 1987	4508-089
11007-143	Ballhead – double spring after 1987	4508-090
11007-143	Ballhead – double spring before 1987	110989
11007-144	Ballarm (high speed)	196049
11007-145	Oilite bushing	3002-526
11007-148	Rocker arm pin	184466
11007-149	Spring clip	3013-520
11007-150	Thrust bearing assembly	111006
11007-150A	Thrust bearing cup	111005
11007-150B	Thrust bearing	180179
11007-154	Lower speeder rod	111207
11007-155	Lower speeder rod pin	184912
11007-156	Speed switch spring	Call – special
11007-157	Speed setting plug	110160
11007-158	Upper speeder rod	111208
11007-159	Upper speeder rod pin	184913
11007-161	Rocker arm	111206
11007-169	Mercury switch	201079
11007-170	Low speed ballarm	4500-002
11007-170	Low speed ballarm – double spring	4500-003

Speed Switch Driver Gear List					
P/N	Teeth	Approx. Diameter	Face Height	Series	Material
224023	8	0.537	21/32	Wide	Steel
1445-220	8	0.537	5/8	Narrow	Steel
204882	10	0.656	21/32	Wide	Steel
1445-222	10	0.656	5/8	Narrow	Steel
1447-626	12	0.75	15/16	Wide	Delrin
224057	12	0.75	3/4	Narrow	Delrin
204365	12	0.75	3/4	Narrow	Delrin
1447-832	12	1	21/32	Wide	Delrin
1447-814	12	1	7/16	Narrow	Delrin
1447-628	16	1	15/16	Wide	Delrin
204750	16	1	3/4	Narrow	Delrin
1447-642	18	1.125	21/32	Wide	Delrin
204817	18	1.125	7/16	Narrow	Delrin
1447-834	18	1.5	21/32	Wide	Delrin
204332	18	1.5	7/16	Narrow	Delrin
1447-630	20	1.25	21/32	Wide	Delrin
1447-617	20	1.25	7/16	Narrow	Delrin
1447-844	22	1.8	21/32	Wide	Delrin
1447-816	22	1.8	7/16	Narrow	Delrin
1447-632	24	1.5	21/32	Wide	Delrin
224110	24	1.5	7/16	Narrow	Delrin
1447-842	26	3.25	21/32	Wide	Delrin
1447-810	26	3.25	7/16	Narrow	Delrin
1447-652	28	1.75	21/32	Wide	Delrin
1447-846	28	2.3	21/32	Wide	Delrin
224155	28	2.3	7/16	Narrow	Delrin
1447-848	30	2.5	21/32	Wide	Delrin
204333	30	2.5	7/16	Narrow	Delrin
1447-634	32	2	21/32	Wide	Delrin
224010	32	2	7/16	Narrow	Delrin
1447-636	36	2.25	21/32	Wide	Delrin
204739	36	2.25	7/16	Narrow	Delrin
1447-836	36	3	21/32	Wide	Delrin
204758	36	3	7/16	Narrow	Delrin

1447-850	38	3.2	21/32	Wide	Delrin
224156	38	3.2	7/16	Narrow	Delrin
1447-638	40	2.5	21/32	Wide	Delrin
1447-624	40	2.5	7/16	Narrow	Delrin
1447-838	40	3.33	21/32	Wide	Delrin
204336	40	3.33	7/16	Narrow	Delrin
1447-640	56	3.5	21/32	Wide	Delrin
1447-618	56	3.5	7/16	Narrow	Delrin

Note: *This table should assist the selection process*

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