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30522-1 & 30522-8

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FUEL INJECTOR CHARACTERIZATION
GM INJECTOR DATA 30522-1 & 30522-8
Fuel Injector Offset vs Battery Voltage vs VAC

LS1	MANIFOLD VACUUM (kPa)																
Voltage	0*	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80
4.5	2.593	2.604	2.615	2.627	2.638	2.649	2.661	2.672	2.683	2.695	2.706	2.717	2.729	2.740	2.751	2.763	2.774
5.0	2.423	2.434	2.445	2.455	2.466	2.476	2.487	2.498	2.508	2.519	2.529	2.540	2.550	2.561	2.572	2.582	2.593
5.5	2.265	2.275	2.285	2.295	2.305	2.314	2.324	2.334	2.344	2.354	2.364	2.374	2.384	2.394	2.404	2.413	2.423
6.0	2.117	2.126	2.135	2.145	2.154	2.163	2.172	2.182	2.191	2.200	2.209	2.219	2.228	2.237	2.246	2.256	2.265
6.5	1.979	1.987	1.996	2.005	2.013	2.022	2.030	2.039	2.048	2.056	2.065	2.074	2.082	2.091	2.100	2.108	2.117
7.0	1.849	1.857	1.865	1.874	1.882	1.890	1.898	1.906	1.914	1.922	1.930	1.938	1.946	1.954	1.962	1.971	1.979
7.5	1.728	1.736	1.744	1.751	1.759	1.766	1.774	1.781	1.789	1.796	1.804	1.812	1.819	1.827	1.834	1.842	1.849
8.0	1.615	1.623	1.630	1.637	1.644	1.651	1.658	1.665	1.672	1.679	1.686	1.693	1.700	1.707	1.714	1.721	1.728
8.5	1.510	1.516	1.523	1.530	1.536	1.543	1.549	1.556	1.563	1.569	1.576	1.582	1.589	1.596	1.602	1.609	1.615
9.0	1.411	1.417	1.424	1.430	1.436	1.442	1.448	1.454	1.461	1.467	1.473	1.479	1.485	1.491	1.498	1.504	1.510
9.5	1.319	1.325	1.330	1.336	1.342	1.348	1.354	1.359	1.365	1.371	1.377	1.382	1.388	1.394	1.400	1.405	1.411
10.0	1.233	1.238	1.244	1.249	1.254	1.260	1.265	1.270	1.276	1.281	1.287	1.292	1.297	1.303	1.308	1.314	1.319
10.5	1.152	1.157	1.162	1.167	1.172	1.177	1.182	1.187	1.192	1.198	1.203	1.208	1.213	1.218	1.223	1.228	1.233
11.0	1.077	1.082	1.086	1.091	1.096	1.100	1.105	1.110	1.115	1.119	1.124	1.129	1.133	1.138	1.143	1.147	1.152
11.5	1.007	1.011	1.015	1.020	1.024	1.029	1.033	1.037	1.042	1.046	1.050	1.055	1.059	1.064	1.068	1.072	1.077
12.0	0.941	0.945	0.949	0.953	0.957	0.961	0.965	0.970	0.974	0.978	0.982	0.986	0.990	0.994	0.998	1.002	1.007
12.5	0.879	0.883	0.887	0.891	0.895	0.898	0.902	0.906	0.910	0.914	0.918	0.922	0.925	0.929	0.933	0.937	0.941
13.0	0.822	0.825	0.829	0.833	0.836	0.840	0.843	0.847	0.851	0.854	0.858	0.861	0.865	0.868	0.872	0.876	0.879
13.5	0.768	0.771	0.775	0.778	0.781	0.785	0.788	0.792	0.795	0.798	0.802	0.805	0.808	0.812	0.815	0.818	0.822
14.0	0.718	0.721	0.724	0.727	0.730	0.734	0.737	0.740	0.743	0.746	0.749	0.752	0.756	0.759	0.762	0.765	0.768
14.5	0.671	0.674	0.677	0.680	0.683	0.686	0.689	0.691	0.694	0.697	0.700	0.703	0.706	0.709	0.712	0.715	0.718
15.0	0.627	0.630	0.633	0.635	0.638	0.641	0.644	0.646	0.649	0.652	0.655	0.657	0.660	0.663	0.665	0.668	0.671
15.5	0.586	0.589	0.591	0.594	0.596	0.599	0.601	0.604	0.607	0.609	0.612	0.614	0.617	0.619	0.622	0.625	0.627
16.0	0.548	0.550	0.553	0.555	0.557	0.560	0.562	0.565	0.567	0.569	0.572	0.574	0.577	0.579	0.581	0.584	0.586
16.5	0.512	0.514	0.516	0.519	0.521	0.523	0.525	0.528	0.530	0.532	0.534	0.537	0.539	0.541	0.543	0.546	0.548
17.0	0.479	0.481	0.483	0.485	0.487	0.489	0.491	0.493	0.495	0.497	0.499	0.502	0.504	0.506	0.508	0.510	0.512
17.5	0.447	0.449	0.451	0.453	0.455	0.457	0.459	0.461	0.463	0.465	0.467	0.469	0.471	0.473	0.475	0.477	0.479
18.0	0.418	0.420	0.422	0.424	0.425	0.427	0.429	0.431	0.433	0.434	0.436	0.438	0.440	0.442	0.444	0.445	0.447

*Pick which table that best fits in your ECU



FUEL INJECTOR CHARACTERIZATION
GM INJECTOR DATA 30522-1 & 30522-8
Fuel Injector Offset vs Battery Voltage vs VAC (continued)

LS2	MANIFOLD VACUUM (kPa)																
Voltage	-80	-70	-60	-50	-40	-30	-20	-10	0*	10	20	30	40	50	60	70	80
4.5	2.423	2.445	2.466	2.487	2.508	2.529	2.550	2.572	2.593	2.615	2.638	2.661	2.683	2.706	2.729	2.751	2.774
5.0	2.265	2.285	2.305	2.324	2.344	2.364	2.384	2.404	2.423	2.445	2.466	2.487	2.508	2.529	2.550	2.572	2.593
5.5	2.117	2.135	2.154	2.172	2.191	2.209	2.228	2.246	2.265	2.285	2.305	2.324	2.344	2.364	2.384	2.404	2.423
6.0	1.979	1.996	2.013	2.030	2.048	2.065	2.082	2.100	2.117	2.135	2.154	2.172	2.191	2.209	2.228	2.246	2.265
6.5	1.849	1.865	1.882	1.898	1.914	1.930	1.946	1.962	1.979	1.996	2.013	2.030	2.048	2.065	2.082	2.100	2.117
7.0	1.728	1.744	1.759	1.774	1.789	1.804	1.819	1.834	1.849	1.865	1.882	1.898	1.914	1.930	1.946	1.962	1.979
7.5	1.615	1.630	1.644	1.658	1.672	1.686	1.700	1.714	1.728	1.744	1.759	1.774	1.789	1.804	1.819	1.834	1.849
8.0	1.510	1.523	1.536	1.549	1.563	1.576	1.589	1.602	1.615	1.630	1.644	1.658	1.672	1.686	1.700	1.714	1.728
8.5	1.411	1.424	1.436	1.448	1.461	1.473	1.485	1.498	1.510	1.523	1.536	1.549	1.563	1.576	1.589	1.602	1.615
9.0	1.319	1.330	1.342	1.354	1.365	1.377	1.388	1.400	1.411	1.424	1.436	1.448	1.461	1.473	1.485	1.498	1.510
9.5	1.233	1.244	1.254	1.265	1.276	1.287	1.297	1.308	1.319	1.330	1.342	1.354	1.365	1.377	1.388	1.400	1.411
10.0	1.152	1.162	1.172	1.182	1.192	1.203	1.213	1.223	1.233	1.244	1.254	1.265	1.276	1.287	1.297	1.308	1.319
10.5	1.077	1.086	1.096	1.105	1.115	1.124	1.133	1.143	1.152	1.162	1.172	1.182	1.192	1.203	1.213	1.223	1.233
11.0	1.007	1.015	1.024	1.033	1.042	1.050	1.059	1.068	1.077	1.086	1.096	1.105	1.115	1.124	1.133	1.143	1.152
11.5	0.941	0.949	0.957	0.965	0.974	0.982	0.990	0.998	1.007	1.015	1.024	1.033	1.042	1.050	1.059	1.068	1.077
12.0	0.879	0.887	0.895	0.902	0.910	0.918	0.925	0.933	0.941	0.949	0.957	0.965	0.974	0.982	0.990	0.998	1.007
12.5	0.822	0.829	0.836	0.843	0.851	0.858	0.865	0.872	0.879	0.887	0.895	0.902	0.910	0.918	0.925	0.933	0.941
13.0	0.768	0.775	0.781	0.788	0.795	0.802	0.808	0.815	0.822	0.829	0.836	0.843	0.851	0.858	0.865	0.872	0.879
13.5	0.718	0.724	0.730	0.737	0.743	0.749	0.756	0.762	0.768	0.775	0.781	0.788	0.795	0.802	0.808	0.815	0.822
14.0	0.671	0.677	0.683	0.689	0.694	0.700	0.706	0.712	0.718	0.724	0.730	0.737	0.743	0.749	0.756	0.762	0.768
14.5	0.627	0.633	0.638	0.644	0.649	0.655	0.660	0.665	0.671	0.677	0.683	0.689	0.694	0.700	0.706	0.712	0.718
15.0	0.586	0.591	0.596	0.601	0.607	0.612	0.617	0.622	0.627	0.633	0.638	0.644	0.649	0.655	0.660	0.665	0.671
15.5	0.548	0.553	0.557	0.562	0.567	0.572	0.577	0.581	0.586	0.591	0.596	0.601	0.607	0.612	0.617	0.622	0.627
16.0	0.512	0.516	0.521	0.525	0.530	0.534	0.539	0.543	0.548	0.553	0.557	0.562	0.567	0.572	0.577	0.581	0.586
16.5	0.479	0.483	0.487	0.491	0.495	0.499	0.504	0.508	0.512	0.516	0.521	0.525	0.530	0.534	0.539	0.543	0.548
17.0	0.447	0.451	0.455	0.459	0.463	0.467	0.471	0.475	0.479	0.483	0.487	0.491	0.495	0.499	0.504	0.508	0.512
17.5	0.418	0.422	0.425	0.429	0.433	0.436	0.440	0.444	0.447	0.451	0.455	0.459	0.463	0.467	0.471	0.475	0.479
18.0	0.391	0.394	0.398	0.401	0.404	0.408	0.411	0.415	0.418	0.422	0.425	0.429	0.433	0.436	0.440	0.444	0.447
18.5	0.365	0.368	0.372	0.375	0.378	0.381	0.384	0.388	0.391	0.394	0.398	0.401	0.404	0.408	0.411	0.415	0.418
19.0	0.341	0.344	0.347	0.350	0.353	0.356	0.359	0.362	0.365	0.368	0.372	0.375	0.378	0.381	0.384	0.388	0.391
19.5	0.319	0.322	0.325	0.327	0.330	0.333	0.336	0.339	0.341	0.344	0.347	0.350	0.353	0.356	0.359	0.362	0.365
20.0	0.298	0.301	0.303	0.306	0.309	0.311	0.314	0.316	0.319	0.322	0.325	0.327	0.330	0.333	0.336	0.339	0.341
20.5	0.279	0.281	0.284	0.286	0.288	0.291	0.293	0.296	0.298	0.301	0.303	0.306	0.309	0.311	0.314	0.316	0.319

*Pick which table that best fits in your ECU



FUEL INJECTOR CHARACTERIZATION
GM INJECTOR DATA 30522-1 & 30522-8
Fuel Injector Offset vs Battery Voltage vs VAC (continued)

COBALT	MANIFOLD VACUUM (kPa)																																
Voltage	-120	-114	-108	-101	-95	-89	-83	-76	-70	-64	-58	-51	-45	-39	-33	-26	-20	-14	-8	-1	5	11	18	24	30	36	43	49	55	61	68	74	80
4.5	2.101	2.113	2.125	2.139	2.150	2.162	2.174	2.188	2.200	2.212	2.223	2.237	2.249	2.261	2.273	2.287	2.298	2.310	2.322	2.336	2.348	2.360	2.373	2.385	2.397	2.409	2.423	2.434	2.446	2.458	2.472	2.484	2.496
5.0	1.996	2.008	2.019	2.032	2.043	2.055	2.066	2.079	2.090	2.101	2.113	2.126	2.137	2.148	2.160	2.173	2.184	2.195	2.206	2.220	2.231	2.242	2.255	2.266	2.278	2.289	2.302	2.313	2.325	2.336	2.349	2.360	2.371
5.5	1.895	1.906	1.916	1.929	1.939	1.950	1.961	1.973	1.984	1.995	2.005	2.018	2.028	2.039	2.050	2.062	2.073	2.084	2.094	2.107	2.117	2.128	2.140	2.151	2.162	2.172	2.185	2.196	2.206	2.217	2.229	2.240	2.251
6.0	1.797	1.807	1.817	1.829	1.839	1.849	1.859	1.871	1.881	1.891	1.901	1.913	1.923	1.933	1.943	1.955	1.965	1.975	1.985	1.997	2.007	2.018	2.029	2.039	2.050	2.060	2.071	2.082	2.092	2.102	2.114	2.124	2.134
6.5	1.701	1.711	1.720	1.732	1.741	1.751	1.760	1.772	1.781	1.791	1.800	1.811	1.821	1.831	1.840	1.851	1.861	1.871	1.880	1.891	1.901	1.910	1.922	1.931	1.941	1.950	1.962	1.971	1.981	1.990	2.002	2.011	2.021
7.0	1.609	1.618	1.627	1.638	1.647	1.656	1.665	1.676	1.685	1.694	1.703	1.713	1.722	1.731	1.741	1.751	1.760	1.769	1.778	1.789	1.798	1.807	1.818	1.827	1.836	1.845	1.855	1.864	1.873	1.883	1.893	1.902	1.911
7.5	1.520	1.529	1.537	1.547	1.556	1.564	1.573	1.583	1.591	1.600	1.608	1.618	1.627	1.636	1.644	1.654	1.663	1.671	1.680	1.690	1.698	1.707	1.717	1.726	1.734	1.743	1.753	1.761	1.770	1.778	1.788	1.797	1.805
8.0	1.434	1.442	1.450	1.460	1.468	1.476	1.484	1.493	1.501	1.509	1.518	1.527	1.535	1.543	1.551	1.561	1.569	1.577	1.585	1.594	1.602	1.610	1.620	1.628	1.636	1.644	1.654	1.662	1.670	1.678	1.687	1.695	1.703
8.5	1.351	1.359	1.366	1.375	1.383	1.391	1.398	1.407	1.415	1.422	1.430	1.439	1.446	1.454	1.462	1.470	1.478	1.486	1.493	1.502	1.510	1.517	1.526	1.534	1.542	1.549	1.558	1.566	1.573	1.581	1.590	1.597	1.605
9.0	1.271	1.279	1.286	1.294	1.301	1.308	1.316	1.324	1.331	1.338	1.346	1.354	1.361	1.368	1.375	1.384	1.391	1.398	1.405	1.414	1.421	1.428	1.436	1.443	1.451	1.458	1.466	1.473	1.480	1.488	1.496	1.503	1.510
9.5	1.195	1.202	1.208	1.216	1.223	1.230	1.236	1.244	1.251	1.258	1.264	1.272	1.279	1.286	1.292	1.300	1.307	1.314	1.321	1.328	1.335	1.342	1.350	1.356	1.363	1.370	1.378	1.384	1.391	1.398	1.406	1.413	1.419
10.0	1.121	1.128	1.134	1.141	1.148	1.154	1.160	1.168	1.174	1.180	1.187	1.194	1.200	1.207	1.213	1.220	1.227	1.233	1.239	1.247	1.253	1.259	1.267	1.273	1.279	1.286	1.293	1.299	1.306	1.312	1.319	1.326	1.332
10.5	1.051	1.057	1.063	1.070	1.076	1.082	1.087	1.094	1.100	1.106	1.112	1.119	1.125	1.131	1.137	1.144	1.150	1.156	1.162	1.168	1.174	1.180	1.187	1.193	1.199	1.205	1.212	1.218	1.224	1.230	1.237	1.242	1.248
11.0	0.984	0.989	0.995	1.001	1.007	1.012	1.018	1.024	1.030	1.035	1.041	1.047	1.053	1.059	1.064	1.071	1.076	1.082	1.087	1.094	1.099	1.105	1.111	1.117	1.122	1.128	1.134	1.140	1.145	1.151	1.157	1.163	1.168
11.5	0.920	0.925	0.930	0.936	0.941	0.946	0.951	0.958	0.963	0.968	0.973	0.979	0.984	0.989	0.995	1.001	1.006	1.011	1.016	1.022	1.027	1.033	1.039	1.044	1.049	1.054	1.060	1.065	1.071	1.076	1.082	1.087	1.092
12.0	0.858	0.863	0.868	0.874	0.879	0.883	0.888	0.894	0.899	0.904	0.908	0.914	0.919	0.924	0.929	0.934	0.939	0.944	0.949	0.954	0.959	0.964	0.970	0.975	0.979	0.984	0.990	0.995	1.000	1.004	1.010	1.015	1.020
12.5	0.801	0.805	0.810	0.815	0.819	0.824	0.828	0.834	0.838	0.843	0.847	0.852	0.857	0.861	0.866	0.871	0.876	0.880	0.885	0.890	0.895	0.899	0.904	0.909	0.913	0.918	0.923	0.928	0.932	0.937	0.942	0.946	0.951
13.0	0.746	0.750	0.754	0.759	0.763	0.767	0.772	0.777	0.781	0.785	0.789	0.794	0.798	0.802	0.807	0.812	0.816	0.820	0.824	0.829	0.833	0.837	0.842	0.847	0.851	0.855	0.860	0.864	0.868	0.872	0.877	0.882	0.886
13.5	0.694	0.698	0.702	0.706	0.710	0.714	0.718	0.723	0.727	0.731	0.734	0.739	0.743	0.747	0.751	0.755	0.759	0.763	0.767	0.772	0.775	0.779	0.784	0.788	0.792	0.796	0.800	0.804	0.808	0.812	0.817	0.820	0.824
14.0	0.645	0.649	0.653	0.657	0.661	0.664	0.668	0.672	0.676	0.679	0.683	0.687	0.691	0.695	0.698	0.702	0.706	0.710	0.713	0.718	0.721	0.725	0.729	0.733	0.736	0.740	0.744	0.748	0.751	0.755	0.759	0.763	0.767
14.5	0.600	0.603	0.607	0.611	0.614	0.617	0.621	0.625	0.628	0.631	0.635	0.639	0.642	0.646	0.649	0.653	0.656	0.660	0.663	0.667	0.670	0.674	0.678	0.681	0.684	0.688	0.692	0.695	0.699	0.702	0.706	0.709	0.713
15.0	0.558	0.561	0.564	0.568	0.571	0.574	0.577	0.581	0.584	0.587	0.590	0.594	0.597	0.600	0.603	0.607	0.610	0.613	0.616	0.620	0.623	0.626	0.630	0.633	0.636	0.639	0.643	0.646	0.649	0.652	0.656	0.659	0.662
15.5	0.518	0.521	0.524	0.528	0.530	0.533	0.536	0.540	0.543	0.546	0.548	0.552	0.555	0.558	0.561	0.564	0.567	0.570	0.573	0.576	0.579	0.582	0.585	0.588	0.591	0.594	0.598	0.601	0.603	0.606	0.610	0.613	0.616
16.0	0.482	0.485	0.488	0.491	0.493	0.496	0.499	0.502	0.505	0.508	0.510	0.513	0.516	0.519	0.522	0.525	0.527	0.530	0.533	0.536	0.539	0.541	0.545	0.547	0.550	0.553	0.556	0.559	0.561	0.564	0.567	0.570	0.573
16.5	0.449	0.452	0.454	0.457	0.460	0.462	0.465	0.468	0.470	0.473	0.475	0.478	0.481	0.483	0.486	0.489	0.491	0.494	0.496	0.499	0.502	0.504	0.507	0.510	0.512	0.515	0.518	0.520	0.523	0.525	0.528	0.531	0.533
17.0	0.419	0.422	0.424	0.427	0.429	0.431	0.434	0.437	0.439	0.441	0.444	0.446	0.449	0.451	0.453	0.456	0.459	0.461	0.463	0.466	0.468	0.471	0.474	0.476	0.478	0.481	0.483	0.486	0.488	0.490	0.493	0.496	



FUEL INJECTOR CHARACTERIZATION
GM INJECTOR DATA 30522-1 & 30522-8
Fuel Injector Offset vs Battery Voltage vs VAC (continued)

LS3	MANIFOLD VACUUM (kPa)																																
Voltage	128	148	168	188	208	228	248	268	288	308	328	348	368	388	408	428	448	468	488	508	528	548	568	588	608	628	648	668	688	708	728	748	768
4.0	2.117	2.168	2.219	2.270	2.321	2.372	2.423	2.467	2.511	2.555	2.599	2.643	2.686	2.730	2.774	2.824	2.875	2.925	2.975	3.025	3.075	3.125	3.176	3.233	3.291	3.348	3.406	3.463	3.520	3.578	3.635	3.635	3.635
5.0	1.849	1.894	1.939	1.983	2.028	2.072	2.117	2.155	2.194	2.232	2.270	2.308	2.347	2.385	2.423	2.467	2.511	2.555	2.599	2.643	2.686	2.730	2.774	2.824	2.875	2.925	2.975	3.025	3.075	3.125	3.176	3.176	3.176
6.0	1.615	1.654	1.693	1.732	1.771	1.810	1.849	1.883	1.916	1.950	1.983	2.017	2.050	2.083	2.117	2.155	2.194	2.232	2.270	2.308	2.347	2.385	2.423	2.467	2.511	2.555	2.599	2.643	2.686	2.730	2.774	2.774	2.774
7.0	1.411	1.445	1.479	1.513	1.547	1.581	1.615	1.645	1.674	1.703	1.732	1.762	1.791	1.820	1.849	1.883	1.916	1.950	1.983	2.017	2.050	2.083	2.117	2.155	2.194	2.232	2.270	2.308	2.347	2.385	2.423	2.423	2.423
8.0	1.233	1.263	1.292	1.322	1.352	1.381	1.411	1.437	1.462	1.488	1.513	1.539	1.564	1.590	1.615	1.645	1.674	1.703	1.732	1.762	1.791	1.820	1.849	1.883	1.916	1.950	1.983	2.017	2.050	2.083	2.117	2.117	2.117
9.0	1.077	1.103	1.129	1.155	1.181	1.207	1.233	1.255	1.277	1.300	1.322	1.344	1.367	1.389	1.411	1.437	1.462	1.488	1.513	1.539	1.564	1.590	1.615	1.645	1.674	1.703	1.732	1.762	1.791	1.820	1.849	1.849	1.849
10.0	0.941	0.963	0.986	1.009	1.032	1.054	1.077	1.096	1.116	1.135	1.155	1.174	1.194	1.213	1.233	1.255	1.277	1.300	1.322	1.344	1.367	1.389	1.411	1.437	1.462	1.488	1.513	1.539	1.564	1.590	1.615	1.615	1.615
11.0	0.822	0.842	0.861	0.881	0.901	0.921	0.941	0.958	0.975	0.992	1.009	1.026	1.043	1.060	1.077	1.096	1.116	1.135	1.155	1.174	1.194	1.213	1.233	1.255	1.277	1.300	1.322	1.344	1.367	1.389	1.411	1.411	1.411
12.0	0.718	0.735	0.753	0.770	0.787	0.804	0.822	0.837	0.852	0.866	0.881	0.896	0.911	0.926	0.941	0.958	0.975	0.992	1.009	1.026	1.043	1.060	1.077	1.096	1.116	1.135	1.155	1.174	1.194	1.213	1.233	1.233	1.233
13.0	0.627	0.642	0.657	0.672	0.688	0.703	0.718	0.731	0.744	0.757	0.770	0.783	0.796	0.809	0.822	0.837	0.852	0.866	0.881	0.896	0.911	0.926	0.941	0.958	0.975	0.992	1.009	1.026	1.043	1.060	1.077	1.077	1.077
14.0	0.548	0.561	0.574	0.587	0.601	0.614	0.627	0.638	0.650	0.661	0.672	0.684	0.695	0.707	0.718	0.731	0.744	0.757	0.770	0.783	0.796	0.809	0.822	0.837	0.852	0.866	0.881	0.896	0.911	0.926	0.941	0.941	0.941
15.0	0.479	0.490	0.502	0.513	0.525	0.536	0.548	0.558	0.568	0.578	0.587	0.597	0.607	0.617	0.627	0.638	0.650	0.661	0.672	0.684	0.695	0.707	0.718	0.731	0.744	0.757	0.770	0.783	0.796	0.809	0.822	0.822	0.822
16.0	0.418	0.428	0.438	0.448	0.458	0.468	0.479	0.487	0.496	0.505	0.513	0.522	0.530	0.539	0.548	0.558	0.568	0.578	0.587	0.597	0.607	0.617	0.627	0.638	0.650	0.661	0.672	0.684	0.695	0.707	0.718	0.718	0.718
17.0	0.365	0.374	0.383	0.392	0.400	0.409	0.418	0.426	0.433	0.441	0.448	0.456	0.463	0.471	0.479	0.487	0.496	0.505	0.513	0.522	0.530	0.539	0.548	0.558	0.568	0.578	0.587	0.597	0.607	0.617	0.627	0.627	0.627
18.0	0.319	0.327	0.334	0.342	0.350	0.357	0.365	0.372	0.378	0.385	0.392	0.398	0.405	0.411	0.418	0.426	0.433	0.441	0.448	0.456	0.463	0.471	0.479	0.487	0.496	0.505	0.513	0.522	0.530	0.539	0.548	0.548	0.548
19.0	0.279	0.285	0.292	0.299	0.306	0.312	0.319	0.325	0.331	0.336	0.342	0.348	0.354	0.359	0.365	0.372	0.378	0.385	0.392	0.398	0.405	0.411	0.418	0.426	0.433	0.441	0.448	0.456	0.463	0.471	0.479	0.479	0.479
20.0	0.243	0.249	0.255	0.261	0.267	0.273	0.279	0.284	0.289	0.294	0.299	0.304	0.309	0.314	0.319	0.325	0.331	0.336	0.342	0.348	0.354	0.359	0.365	0.372	0.378	0.385	0.392	0.398	0.405	0.411	0.418	0.418	0.418

LS7	MANIFOLD VACUUM (kPa)																																
Voltage	128	144	160	176	192	208	224	240	256	272	288	304	320	336	352	368	384	400*	416	432	448	464	480	496	512	528	544	560	576	592	608	624	640
4.0	2.117	2.162	2.206	2.251	2.296	2.340	2.385	2.423	2.457	2.491	2.524	2.558	2.591	2.625	2.659	2.697	2.736	2.774	2.812	2.849	2.886	2.924	2.961	3.004	3.047	3.090	3.133	3.176	3.329	3.482	3.635	3.635	3.635
5.0	1.849	1.888	1.927	1.966	2.005	2.044	2.083	2.117	2.146	2.176	2.205	2.234	2.264	2.293	2.323	2.356	2.390	2.423	2.456	2.489	2.521	2.554	2.587	2.624	2.662	2.699	2.737	2.774	2.908	3.042	3.176	3.176	3.176
6.0	1.615	1.650	1.684	1.718	1.752	1.786	1.820	1.849	1.875	1.901	1.926	1.952	1.978	2.003	2.029	2.058	2.088	2.117	2.146	2.174	2.203	2.231	2.260	2.293	2.325	2.358	2.391	2.423	2.540	2.657	2.774	2.774	2.774
7.0	1.411	1.441	1.471	1.501	1.530	1.560	1.590	1.615	1.638	1.660	1.683	1.705	1.728	1.750	1.772	1.798	1.824	1.849	1.874	1.899	1.924	1.949	1.974	2.003	2.031	2.060	2.088	2.117	2.219	2.321	2.423	2.423	2.423
8.0	1.233	1.259	1.285	1.311	1.337	1.363	1.389	1.411	1.431	1.450	1.470	1.490	1.509	1.529	1.548	1.571	1.593	1.615	1.637	1.659	1.681	1.703	1.724	1.749	1.774	1.799	1.824	1.849	1.939	2.028	2.117	2.117	2.117
9.0	1.077	1.100	1.122	1.145	1.168	1.191	1.213	1.233	1.250	1.267	1.284	1.301	1.318	1.335	1.352	1.372	1.392	1.411	1.430	1.449	1.468	1.487	1.506	1.528	1.550	1.572	1.594	1.615	1.693	1.771	1.849	1.849	1.849
10.0	0.941	0.961	0.980	1.000	1.020	1.040																											



FUEL INJECTOR CHARACTERIZATION

GM INJECTOR DATA 30522-1 & 30522-8

Fuel Injector Offset vs Battery Voltage vs VAC (continued)

GM FLOW

LS1																	
Manifold Vacuum (kPa)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80
Flow Rate (lb/hr)	51.5	51.8	52.1	52.4	52.7	53.0	53.4	53.7	54.0	54.3	54.6	54.9	55.2	55.5	55.8	56.1	56.4
Scaled Flow Rate (lb/hr)	25.7	25.9	26.1	26.2	26.4	26.5	26.7	26.8	27.0	27.1	27.3	27.4	27.6	27.7	27.9	28.0	28.2

LS2																	
Manifold Vacuum (kPa)	-80	-70	-60	-50	-40	-30	-20	-10	0	10	20	30	40	50	60	70	80
Flow Rate (lb/hr)	46.0	46.7	47.4	48.1	48.8	49.5	50.2	50.8	51.5	52.1	52.7	53.4	54.0	54.6	55.2	55.8	56.4
Scaled Flow Rate (lb/hr)	23.0	23.4	23.7	24.1	24.4	24.7	25.1	25.4	25.7	26.1	26.4	26.7	27.0	27.3	27.6	27.9	28.2

COBALT																															
Manifold Vacuum (kPa)	-120	-114	-108	-101	-95	-89	-83	-76	-70	-64	-58	-45	-39	-33	-29	-20	-14	-8	-1	5	11	18	24	30	36	43	49	55	61	68	74
Flow Rate (lb/hr)	43.7	44.1	44.4	44.9	45.3	45.6	46.0	46.5	46.9	47.2	47.6	48.1	48.4	48.8	49.2	50.0	50.4	50.8	51.2	51.6	52.0	52.4	52.8	53.2	53.6	54.0	54.4	54.8	55.2	55.6	56.0

LS3																																	
Differential Pressure (kPa)	128	148	168	188	208	228	248	268	288	308	328	348	368	388	408	428	448	468	488	508	528	548	568	588	608	628	648	668	688	708	728	748	768
Flow Rate (lb/hr)	29.1	31.3	33.4	35.3	37.1	38.9	40.5	42.1	43.7	45.2	46.6	48.0	49.4	50.7	52.0	53.2	54.5	55.7	56.8	58.0	59.1	60.2	61.3	62.4	63.4	64.5	65.5	66.5	67.5	68.5	69.4	70.4	71.3
Scaled Flow Rate (lb/hr)	14.6	15.7	16.7	17.6	18.6	19.4	20.3	21.1	21.8	22.6	23.3	24.0	24.7	25.3	26.0	26.6	27.2	27.8	28.4	29.0	29.6	30.1	30.7	31.2	31.7	32.2	32.8	33.3	33.7	34.2	34.7	35.2	35.7

LS7																																	
Differential Pressure (kPa)	128	144	160	176	192	208	224	240	256	272	288	304	320	336	352	368	384	400	416	432	448	464	480	496	512	528	544	560	576	592	608	624	640
Flow Rate (lb/hr)	29.1	30.9	32.5	34.1	35.7	37.1	38.5	39.9	41.2	42.4	43.7	44.9	46.0	47.2	48.3	49.4	50.4	51.5	52.5	53.5	54.5	55.4	56.4	57.3	58.2	59.1	60.0	60.9	61.8	62.6	63.4	64.3	65.1
Scaled Flow Rate (lb/hr)	14.6	15.4	16.3	17.1	17.8	18.6	19.3	19.9	20.6	21.2	21.8	22.4	23.0	23.6	24.1	24.7	25.2	25.7	26.2	26.7	27.2	27.7	28.2	28.7	29.1	29.6	30.0	30.4	30.9	31.3	31.7	32.1	32.5

note: If you are using a regulator with a return set at 58 psi., Populate the table with the value in the grey cells

Input Scale value IF needed	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
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*Pick which table that best fits in your ECU

GM SHORT PULSE ADDER

PW ms	0.0000	0.0608	0.1216	0.1824	0.2432	0.3040	0.3648	0.4256	0.4864	0.5472	0.6080	0.6688	0.7296	0.7904	0.8512	0.9120	0.9728	1.0336	1.0944	1.1552	1.2160	1.2768	1.3376	1.3984	1.4592	1.5200	1.5808	1.6416	1.7024	1.7632	1.8240	1.8848	1.9456	2.0064
PW Adder	0.000	0.251	0.218	0.185	0.153	0.120	0.087	0.054	0.037	0.022	0.008	-0.007	-0.019	-0.029	-0.039	-0.049	-0.052	-0.051	-0.049	-0.048	-0.048	-0.048	-0.047	-0.045	-0.043	-0.040	-0.042	-0.044	-0.046	-0.048	-0.050	-0.053	-0.054	-0.038

PW ms	2.0672	2.1280	2.1888	2.2496	2.3104	2.3712	2.4320	2.4928	2.5536	2.6144	2.6752	2.7360	2.7968	2.8576	2.9184	2.9792	3.0400	3.1008	3.1616	3.2224	3.2832	3.3440	3.4048	3.4656	3.5264	3.5872	3.6480	3.7088	3.7696	3.8304	3.8912	3.9520	4.0128
PW Adder	-0.031	-0.028	-0.025	-0.023	-0.021	-0.020	-0.018	-0.017	-0.016	-0.014	-0.013	-0.011	-0.010	-0.008	-0.007	-0.006	-0.004	-0.003	-0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

PW ms	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875	1.000	1.125	1.250	1.375	1.500	1.625	1.750	1.875	2.000	2.125	2.250	2.375	2.500	2.625	2.750	2.875	3.000	3.125	3.250	3.375	3.500	3.625	3.750	3.875	4.000
PW Adder	0.000	0.217	0.149	0.081	0.033	0.004	-0.022	-0.043	-0.052	-0.049	-0.048	-0.046	-0.041	-0.044	-0.048	-0.052	-0.047	-0.031	-0.025	-0.021	-0.018	-0.015	-0.012	-0.010	-0.007	-0.004	-0.001	0.000	0.000	0.000	0.000	0.000	0.000

*Most V8's

PW ms	0.000	0.100	0.300	0.400	0.500	0.600	0.800	0.900	1.000	1.100	1.300	1.400	1.500	1.600	1.800	1.900	2.000	2.100	2.300	2.400	2.500	2.600	2.800	2.900	3.000	3.100	3.300	3.400	3.500	3.600	3.800	3.900	4.000
PW Adder	0.000	0.230	0.122	0.068	0.033	0.010	-0.030	-0.047	-0.052	-0.049	-0.048	-0.045	-0.041	-0.043	-0.050	-0.053	-0.047	-0.033	-0.023	-0.021	-0.016	-0.014	-0.004	-0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

*Cobalt Specific

SHORT PULSE LIMIT (ms)

4.000

DEFAULT PULSEWIDTH

0.482

*Pick which table that best fits in your ECU

GM MINIMUM PULSE

RPM	0	400	800	1200	1600	2000	2400	2800	3200	3600	4000	4400	4800	5200	5600	6000	6400	6800	7200	7600	8000
Minimum Inj. PW	0.4821	0.4821	0.4821	0.4821	0.4821	0.4821	0.4821	0.4821	0.4821	0.4821	0.4821	0.4821	0.4821	0.4821	0.4821	0.4821	0.4821	0.4821	0.4821	0.4821	0.4821

RPM	0	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000
Minimum Inj. PW	0.4821	0.4821	0.4821	0.4821	0.4821	0.4821	0.4821	0.4821	0.4821	0.4821	0.4821	0.4821	0.4821	0.4821	0.4821	0.4821	0.4821

*Pick which table that best fits in your ECU

*If you are only needing a single Minimum pulse use the grey values



FUEL INJECTOR CHARACTERIZATION
FORD INJECTOR DATA 30522-1 & 30522-8
For 2011+ applications, for older applications scroll down.

FLOW RATE	
Fuel Injector Breakpoint (lb)	0.0000096
Fuel Injector Hi Slope (lb/sec)	0.0142941
Fuel Injector Low Slope (lb/sec)	0.0179368
Fuel Injector Minimum Pulse Width (sec)	0.0003500
LIMITS	PERCENTAGE
Max Allowed Inj Duty Cycle	1.999
Max Allowed Inj Duty Cycle on Alcohol	2.000

OFFSET VS. VOLTAGE	
Battery Voltage	PW (ms)
6.0	2.1170
7.0	1.8493
8.0	1.6155
9.0	1.4112
10.0	1.2328
11.0	1.0769
12.0	0.9407
13.0	0.8218
13.5	0.7681
14.0	0.7179
14.5	0.6710
15.0	0.6271

FLOW RATE LOW MULT VS. PRESSURE		
Fuel System Type DeltaP	Factory Multiplier	Return Multiplier
67	1.0232	1.0000
64	1.0000	1.0000
58	0.9520	1.0000
54	0.9186	1.0000
50	0.8838	1.0000
46	0.8478	1.0000

FLOW RATE HIGH MULT VS. PRESSURE		
Fuel System Type DeltaP	Factory Multiplier	Return Multiplier
67	1.0232	1.0000
64	1.0000	1.0000
58	0.9520	1.0000
54	0.9186	1.0000
50	0.8838	1.0000
46	0.8478	1.0000

BREAKPOINT MULT		
Fuel System Type DeltaP	Factory Multiplier	Return Multiplier
67	1.0232	1.0000
64	1.0000	1.0000
58	0.9520	1.0000
54	0.9186	1.0000
50	0.8838	1.0000
46	0.8478	1.0000

OFFSET MULT VS. PRESSURE		
Fuel System Type DeltaP	Factory Multiplier	Return Multiplier
67	1.0232	1.0000
64	1.0000	1.0000
58	0.9520	1.0000
54	0.9186	1.0000
50	0.8838	1.0000
46	0.8478	1.0000
42	0.8101	1.0000

If you are running the factory fuel system plumbing use the Factory Multipliers.
If you are running a reuglator with a return to the tank us the Return Multipliers. Base fuel pressure must be set to 58psi.

39 PSI Fuel Systems
For 2010 and older applications below

If you are running the factory fuel system plumbing use the Factory Multipliers. If you are running a regulator with a return to the tank us the Return Multipliers. Base pressure must be set to 39psi.

FLOW RATE	
Fuel Injector Breakpoint (lb)	0.0000085
Fuel Injector Hi Slope (lb/sec)	0.0119401
Fuel Injector Low Slope (lb/sec)	0.0149829
Fuel Injector Minimum Pulse Width (sec)	0.0003500
LIMITS	PERCENTAGE
Max Allowed Inj Duty Cycle	1.999
Max Allowed Inj Duty Cycle on Alcohol	2.000

OFFSET VS. VOLTAGE	
Battery Voltage	PW (ms)
6.0	1.7756
8.0	1.4174
10.0	1.1083
11.0	0.9723
12.0	0.8485
13.0	0.7371
14.0	0.6379
15.0	0.5511

FLOW RATE LOW MULT VS. PRESSURE		
Fuel System Type DeltaP	Factory Multiplier	Return Multiplier
60.03	1.1389	1.0000
54.96	1.1059	1.0000
50.03	1.0734	1.0000
39.15	1.0000	1.0000
30.02	0.9423	1.0000
20.01	0.8768	1.0000

FLOW RATE HIGH MULT VS. PRESSURE		
Fuel System Type DeltaP	Factory Multiplier	Return Multiplier
60.03	1.1389	1.0000
54.96	1.1059	1.0000
50.03	1.0734	1.0000
39.15	1.0000	1.0000
30.02	0.9423	1.0000
20.01	0.8768	1.0000

BREAKPOINT MULT		
Fuel System Type DeltaP	Factory Multiplier	Return Multiplier
60.03	1.1389	1.0000
54.96	1.1059	1.0000
50.03	1.0734	1.0000
39.15	1.0000	1.0000
30.02	0.9423	1.0000
20.01	0.8768	1.0000

OFFSET MULT VS. PRESSURE		
Fuel System Type DeltaP	Factory Multiplier	Return Multiplier
60.03	1.1389	1.0000
54.96	1.1059	1.0000
50.03	1.0734	1.0000
39.15	1.0000	1.0000
30.02	0.9423	1.0000
20.01	0.8768	1.0000



FUEL INJECTOR CHARACTERIZATION
DODGE/CHRYSLER/JEEP INJECTOR DATA 30522-1 & 30522-8

INJECTOR PULSE WIDTH (ms)	FUEL MASS (Grams)
0.000	0.00000
0.350	0.00282
0.550	0.00452
0.750	0.00608
0.950	0.00734
1.150	0.00863
1.350	0.00988
1.550	0.01123
1.750	0.01257
1.950	0.01372
2.150	0.01496
3.150	0.02131
9.150	0.06021
49.150	0.31956

INJECTOR MIN PW	0.350
-----------------	-------

START UP SCALER	6.484
-----------------	-------

IGNITION VOLTAGE (all in ms)									
KPa	6	7	8	10	12	14	15.8	15.8	15.8
0	2.251	1.987	1.752	1.368	1.077	0.854	0.703	0.703	0.703
20	2.287	2.018	1.780	1.389	1.093	0.866	0.713	0.713	0.713
40	2.324	2.050	1.808	1.410	1.110	0.878	0.722	0.722	0.722
80	2.399	2.116	1.865	1.454	1.143	0.904	0.743	0.743	0.743
100	2.438	2.150	1.894	1.477	1.160	0.917	0.753	0.753	0.753

IGNITION VOLTAGE (all in ms)									
KPa	8	9.5	11	12	12.8	13.5	14	14.7	15.5
-80	1.646	1.370	1.144	1.016	0.930	0.855	0.807	0.743	0.684
0	1.752	1.456	1.214	1.077	0.986	0.905	0.854	0.785	0.722
40	1.808	1.501	1.251	1.110	1.015	0.931	0.878	0.808	0.742
62	1.839	1.527	1.272	1.128	1.031	0.946	0.892	0.820	0.754
84	1.871	1.553	1.293	1.146	1.048	0.961	0.906	0.833	0.765

IGNITION VOLTAGE (all in ms)									
KPa	5	6	7	8	9	10.1	12.1	14.1	15.8
250	2.270	2.000	1.767	1.560	1.379	1.212	0.958	0.764	0.635
300	2.362	2.080	1.837	1.621	1.433	1.259	0.994	0.791	0.657
400	2.559	2.251	1.987	1.752	1.547	1.358	1.069	0.848	0.703
500	2.772	2.438	2.150	1.894	1.671	1.465	1.152	0.911	0.753
550	2.886	2.537	2.237	1.970	1.738	1.523	1.195	0.945	0.779

IGNITION VOLTAGE (all in ms)									
KPa	5	6	7	8	9	10.1	12.1	14.1	15.8
130	2.065	1.820	1.609	1.422	1.259	1.109	0.879	0.703	0.587
244	2.260	1.990	1.758	1.552	1.373	1.207	0.954	0.760	0.633
400	2.559	2.251	1.987	1.752	1.547	1.358	1.069	0.848	0.703
586	2.971	2.611	2.302	2.027	1.787	1.566	1.228	0.970	0.799
660	3.154	2.771	2.441	2.149	1.894	1.658	1.299	1.023	0.842

IGNITION VOLTAGE (all in ms)									
KPa	5	5.7	6.3	7	8	10	12	14	15.8
8	2.559	2.328	2.185	1.987	1.752	1.368	1.077	0.854	0.703
80	2.719	2.473	2.321	2.109	1.865	1.454	1.143	0.904	0.743
117	2.829	2.573	2.414	2.150	1.894	1.477	1.160	0.917	0.753
150	2.886	2.624	2.462	2.237	1.970	1.523	1.195	0.945	0.779
200	2.980	2.709	2.542	2.309	2.033	1.792	1.570	1.232	0.972

*Pick which table that best matches your ECU's pressure and voltage values



FUEL INJECTOR CHARACTERIZATION
HONDA/ACURA INJECTOR DATA 30522-1 & 30522-8

2002 AND NEWER		INJECTOR FLOW	
3.5 BAR, 350 kPa, 51 PSI. System		505	
BATTERY OFFSET			
Voltage		Offset	
0		2.029	
6		2.010	
8		1.549	
10		1.182	
12		0.902	
14		0.683	
16		0.520	
24		0.165	
AFM FUEL			
Air Mass (mg)		51 PSI System	
0		0.000	
70		1.472	
100		1.808	
120		2.032	
200		2.928	
300		4.048	
400		5.168	
750		9.088	
1000		11.888	
1250		14.688	
1500		17.488	
1750		20.287	
2000		23.087	
2250		25.887	
2500		28.687	
2750		31.487	
FUEL ECONOMY			
Inj. Flow for FE:		502	
Inj. Flow for Dash:		502	

2001 AND OLDER		INJECTOR FLOW	
3.0 BAR, 300 kPa, 43.5 PSI. System		470	
BATTERY OFFSET			
Voltage		Offset	
0		1.945	
6		1.927	
8		1.485	
10		1.133	
12		0.865	
14		0.654	
16		0.503	
24		0.158	
AFM FUEL			
Air Mass (mg)		43.5 PSI System	
0		0.000	
70		1.503	
100		1.865	
120		2.106	
200		3.070	
300		4.275	
400		5.480	
750		9.698	
1000		12.711	
1250		15.724	
1500		18.737	
1750		21.750	
2000		24.762	
2250		27.775	
2500		30.788	
2750		33.801	
FUEL ECONOMY			
Inj. Flow for FE:		504	
Inj. Flow for Dash:		504	



FUEL INJECTOR CHARACTERIZATION
MAZDA INJECTOR DATA 30522-1 & 30522-8

INJECTOR BASE PW

6.907

INJECTOR MINIMUM PW

0.482

INJECTOR FLOW RATE

483.7

INJECTOR SCALING GLOBAL

1.00

INJECTOR OPENING TIME

Pressure (kPa)		-15.86	-7.866	0	7.866	15.86	23.73	31.73	39.6	47.46	55.46	63.33	71.19	79.19	87.06	95.06	102.9
Voltage	6.5	1.952	1.965	1.979	1.992	2.005	2.019	2.032	2.046	2.060	2.074	2.087	2.101	2.116	2.130	2.144	2.158
	7.75	1.649	1.660	1.671	1.682	1.694	1.705	1.716	1.728	1.739	1.751	1.763	1.775	1.787	1.799	1.811	1.823
	9	1.392	1.402	1.411	1.421	1.430	1.440	1.450	1.459	1.469	1.479	1.489	1.499	1.509	1.519	1.529	1.539
	10.25	1.176	1.184	1.192	1.200	1.208	1.216	1.224	1.232	1.241	1.249	1.257	1.266	1.274	1.283	1.291	1.300
	11.5	0.993	1.000	1.007	1.013	1.020	1.027	1.034	1.041	1.048	1.055	1.062	1.069	1.076	1.083	1.091	1.098
	12.75	0.839	0.844	0.850	0.856	0.861	0.867	0.873	0.879	0.885	0.891	0.897	0.903	0.909	0.915	0.921	0.927
	14	0.708	0.713	0.718	0.723	0.728	0.732	0.737	0.742	0.747	0.752	0.757	0.762	0.768	0.773	0.778	0.783
	15.25	0.598	0.602	0.606	0.610	0.614	0.619	0.623	0.627	0.631	0.635	0.640	0.644	0.648	0.653	0.657	0.661
	16.5	0.505	0.509	0.512	0.515	0.519	0.522	0.526	0.529	0.533	0.537	0.540	0.544	0.547	0.551	0.555	0.559

VOLUMETRIC EFFICIENCY LOAD MULTIPLIER

RPM	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500
0	1.091	1.091	1.091	1.091	1.091	1.091	1.091	1.091	1.091	1.091	1.091	1.091	1.091	1.091	1.091
0.0625	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040
0.125	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
0.1875	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
0.25	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
0.3125	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
0.375	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
0.4375	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
0.5	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
0.5625	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
0.625	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
0.6875	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
0.75	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
0.8125	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
0.875	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
0.9375	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000



FUEL INJECTOR CHARACTERIZATION
MITSUBISHI INJECTOR DATA 30522-1 & 30522-8
43.5 PSI / 3 BAR / 300 KPa

INJECTOR SIZE (cc/min)	470
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BATTERY VOLTAGE LATENCY COMPENSATION							
Voltage	4.69	7.99	9.97	12.02	14.00	15.98	18.77
Latency	2.322	1.487	1.137	0.862	0.660	0.505	0.346



FUEL INJECTOR CHARACTERIZATION
MERCEDES/BOSCH INJECTOR DATA 30522-1 & 30522-8

INJECTOR CONSTANT	
MS/%	0.07022

OFFSET VS. VOLTAGE					
Volts	7.5	10.6	12.1	15.1	16.6
ms	1.720	1.130	0.933	0.621	0.507

INJECTOR FLOW RATE FACTOR										
250	300	350	400	450	500	550	600	650	700	750
1.265	1.155	1.069	1.000	0.943	0.894	0.853	0.816	0.784	0.756	0.730

INJECTOR PULSE MULT																
	1	1.3	1.6	1.9	2.2	2.5	3	3.5	4	5	6	8	10	12	14	16
520	0.9483	0.9634	0.9733	0.9720	0.9875	0.9927	0.9978	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
760	0.9483	0.9634	0.9733	0.9720	0.9875	0.9927	0.9978	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1000	0.9483	0.9634	0.9733	0.9720	0.9875	0.9927	0.9978	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1240	0.9483	0.9634	0.9733	0.9720	0.9875	0.9927	0.9978	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1520	0.9483	0.9634	0.9733	0.9720	0.9875	0.9927	0.9978	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
2000	0.9483	0.9634	0.9733	0.9720	0.9875	0.9927	0.9978	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
2520	0.9483	0.9634	0.9733	0.9720	0.9875	0.9927	0.9978	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
3000	0.9483	0.9634	0.9733	0.9720	0.9875	0.9927	0.9978	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
3520	0.9483	0.9634	0.9733	0.9720	0.9875	0.9927	0.9978	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
4000	0.9483	0.9634	0.9733	0.9720	0.9875	0.9927	0.9978	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
4520	0.9483	0.9634	0.9733	0.9720	0.9875	0.9927	0.9978	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
5000	0.9483	0.9634	0.9733	0.9720	0.9875	0.9927	0.9978	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
5520	0.9483	0.9634	0.9733	0.9720	0.9875	0.9927	0.9978	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6000	0.9483	0.9634	0.9733	0.9720	0.9875	0.9927	0.9978	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6520	0.9483	0.9634	0.9733	0.9720	0.9875	0.9927	0.9978	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
7000	0.9483	0.9634	0.9733	0.9720	0.9875	0.9927	0.9978	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000



FUEL INJECTOR CHARACTERIZATION
NISSAN/INFINITI INJECTOR DATA 30522-1 & 30522-8

INJECTOR LATENCY	
Injector Scalar	0.718
Injector Offset	-0.094
MIN. PULSEWIDTH	482 µs
INJECTOR SCALAR	
350 KPa (cc/min)	505.5
300 KPa (cc/min)	469.7
NON-LINEAR INJ. COMP. MAX IPW	
3.000 ms	

DIFFERENTIAL FUEL PRESSURE DELTA PERCENT (Cobb/EcuTek)								
*Note Use this table if using stock style fuel system								
MAP	-40	-30	-20	-10	0	10	20	30
Comp %	118	114	110	105	100	95	89	84
*Note If using a vacuum referenced regulator use this table								
MAP	-40	-30	-20	-10	0	10	20	30
Comp %	100	100	100	100	100	100	100	100

PRIMARY INJECTOR BATTERY OFFSET (Cobb/EcuTek)								
Battery voltage								
psi	9	10	11	12	13	14	15	16
20.0	1.131	0.988	0.863	0.754	0.659	0.575	0.503	0.439
25.2	1.166	1.018	0.890	0.777	0.679	0.593	0.518	0.453
31.6	1.210	1.057	0.923	0.807	0.705	0.616	0.538	0.470
39.9	1.270	1.109	0.969	0.846	0.739	0.646	0.564	0.493
50.2	1.348	1.178	1.029	0.899	0.785	0.686	0.599	0.523
63.1	1.454	1.270	1.109	0.969	0.846	0.739	0.646	0.564
79.5	1.599	1.397	1.220	1.066	0.931	0.813	0.711	0.621
100.0	1.801	1.574	1.375	1.201	1.049	0.916	0.801	0.699

INJECTOR LOW PW COMPENSATION (Cobb/EcuTek)																
Effective Pulse Width (ms)																
psi	0.08	0.27	0.47	0.66	0.86	1.05	1.25	1.44	1.64	1.83	2.03	2.22	2.42	2.61	2.81	3.00
20	108	100	96	95	96	96	97	97	97	98	99	99	99	99	100	100
25	108	100	96	95	96	96	97	97	97	98	99	99	99	99	100	100
32	108	100	96	95	96	96	97	97	97	98	99	99	99	99	100	100
40	108	100	96	95	96	96	97	97	97	98	99	99	99	99	100	100
50	108	100	96	95	96	96	97	97	97	98	99	99	99	99	100	100
63	108	100	96	95	96	96	97	97	97	98	99	99	99	99	100	100
79	108	100	96	95	96	96	97	97	97	98	99	99	99	99	100	100
100	108	100	96	95	96	96	97	97	97	98	99	99	99	99	100	100



FUEL INJECTOR CHARACTERIZATION
SUBARU INJECTOR DATA 30522-1 & 30522-8

INJECTOR CONSTANT
6146.2 μs

FLOW RATE
5.65 g/s

INJ. PULSEWIDTH LIMIT
0.540 ms

FUEL INJECTOR TRIM (Max Small IPW)
3.000 ms

FUEL INJECTOR TRIM (Max RPM, Small IPW)
10000 rpm

FUEL INJECTOR LATENCY						
Voltage		6.05	9	11.5	14	16.5
MAP (psi.)	-19.34	1.62	1.16	0.83	0.59	0.42
	0	1.82	1.30	0.92	0.66	0.47
	19.34	2.04	1.45	1.04	0.74	0.53

02-05 WRX SPECIFIC						
Voltage		6.05	9	11.5	14	16.5
MAP (psi.)	-19.34	1.33	1.01	0.77	0.59	0.45
	0	1.48	1.13	0.86	0.66	0.50
	19.34	1.66	1.27	0.97	0.74	0.56

FUEL INJECTOR TRIM (Small IPW) 05-05 WRX SPECIFIC						
PW	0.275	0.820	1.365	1.910	2.455	3.000
%	0.024	-0.051	-0.040	-0.044	-0.018	-0.007

FUEL INJECTOR TRIM (Small IPW)								
PW	0.275	0.665	1.054	1.443	1.832	2.222	2.611	3.000
%	4.40	-5.12	-3.85	-2.67	-2.76	-1.01	-0.56	-0.22

VEHICLES WITH GDI AND PORT INJECTION USE BELOW

Note* This is for vehicles like the FRS/BRZ/GT86/GR86

INJECTOR SCALING
539 cc/min

LOW PW INJ. COMP	
0.540	1.0440
0.892	0.9488
1.243	0.9615
1.594	0.9733
1.946	0.9724
2.297	0.9899
2.649	0.9944
3.000	0.9978

INJ. MIN. OPEN TIME
0.5403 ms

PFI MANIFOLD RELATIVE PRESSURE COMP.		
Manifold Relative Pres. (BAR)	-0.933	0.876
	-0.800	0.894
	-0.667	0.913
	-0.533	0.931
	-0.400	0.949
	-0.267	0.966
	-0.133	0.983
	0.000	1.000
	0.133	1.016
	0.267	1.033
	0.400	1.049
	0.533	1.065
	0.667	1.080
	0.800	1.095
	0.933	1.111
	1.067	1.125

LOW PW COMP MAX IPW
3.000 ms

LOW PW COMP MAX RPM
10000 rpm

INJECTOR OPENING TIME						
Voltage:		8	10	12	14	16
MAP (psi.)	-1000	1.615	1.233	0.941	0.718	0.548
	0	1.615	1.233	0.941	0.718	0.548
	1000	1.615	1.233	0.941	0.718	0.548



FUEL INJECTOR CHARACTERIZATION
AEM INJECTOR DATA 30522-1 & 30522-8

AEM INFINITY	Injector Flow Rate (cc/min)								
Pressure	20	30	40	50	60	70	80	90	100
Flow	317	390	450	504	552	597	632	672	709

INJECTOR OFFSET (ms)		Battery (Volts)			
		10.0	12.0	14.0	16.0
Inj Pressure (psig)	100.0	1.54	1.17	0.90	0.68
	90.0	1.47	1.12	0.85	0.65
	80.0	1.39	1.06	0.81	0.62
	70.0	1.32	1.01	0.77	0.59
	60.0	1.25	0.95	0.73	0.56
	50.0	1.18	0.90	0.69	0.52
	40.0	1.11	0.84	0.64	0.49
	30.0	1.03	0.79	0.60	0.46
	20.0	0.96	0.73	0.56	0.43

AEM EMS, SERIES 1 AND 2	Battery Offset Primary										
Battery Volts	6	7	8	9	10	11	12	13	14	15	16
Batt Offset	1.95	1.72	1.48	1.31	1.13	1.00	0.86	0.76	0.65	0.58	0.50

Inj Size (cc's/min)	470
Injector Min (uSec)	482
Injector Duty Max	95%

* EMS, Series 1 And 2 Data Formated At 3BAR (43.5 PSI)



FUEL INJECTOR CHARACTERIZATION
ECU MASTERS INJECTOR DATA 30522-1 & 30522-8

43.5 PSI / 3 BAR / 300 kPa

INJECTOR SIZE (cc/min)	470
------------------------	-----

FUELING INJECTORS CAL (Battery Offset)												
Volts	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
Modifier	1.833	1.641	1.463	1.297	1.144	1.003	0.876	0.761	0.658	0.569	0.492	0.428

58 PSI / 4 BAR / 400 kPa

INJECTOR SIZE (cc/min)	539
------------------------	-----

FUELING INJECTORS CAL (Battery Offset)												
Volts	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
Modifier	1.994	1.786	1.592	1.411	1.245	1.092	0.953	0.828	0.716	0.619	0.535	0.465



FUEL INJECTOR CHARACTERIZATION
FAST XFI 2.0 INJECTOR DATA 30522-1 & 30522-8

43.5 PSI / 3 BAR / 300 kPa

INJECTOR FLOW RATE (lbs/hr)								
44.5								
INJECTOR OPENING OFFSET VS BATTERY VOLTAGE								
Volts	8	9	10	11	12	13	14	16
Offset (ms)	1.46	1.3	1.14	1.00	0.88	0.76	0.66	0.49

58 PSI / 4 BAR / 400 kPa

INJECTOR FLOW RATE (lbs/hr)								
51.5								
INJECTOR OPENING OFFSET VS BATTERY VOLTAGE								
Volts	8	9	10	11	12	13	14	16
Offset (ms)	1.73	1.54	1.35	1.19	1.04	0.9	0.78	0.58

FAST XFI SPORTSMAN & STREET INJECTOR DATA

43.5 PSI / 3 BAR / 300 kPa	
Injector Flow Rate (lbs/hr)	45
Injector Opening Tims (ms)	0.7

58 PSI / 4 BAR / 400 kPa	
Injector Flow Rate (lbs/hr)	52
Injector Opening Tims (ms)	0.8



FUEL INJECTOR CHARACTERIZATION
HALTECH DATA 30522-1 & 30522-8

HALTECH ELITE AND NEXUS

DEAD TIME TABLE				
Volts\PSI	29.000	43.500	58.000	72.500
16.0	0.446	0.492	0.535	0.582
14.0	0.597	0.658	0.716	0.780
12.0	0.794	0.876	0.953	1.037
10.0	1.037	1.144	1.245	1.354
8.0	1.326	1.463	1.592	1.732
6.0	1.662	1.833	1.994	2.170

INJECTOR FLOW TABLE				
PSI	29.0	43.5	58.0	72.5
Flow(cc)	404	470	539	602

SHORT PULSE WIDTH ADDER (ms)																															
0.000	0.100	0.200	0.300	0.400	0.500	0.600	0.700	0.800	0.900	1.000	1.100	1.200	1.300	1.400	1.500	1.600	1.700	1.800	1.900	2.000	2.100	2.200	2.300	2.400	2.500	2.600	2.700	2.800	2.900	3.000	3.100
0.000	0.202	0.176	0.122	0.072	0.033	0.010	-0.012	-0.030	-0.045	-0.052	-0.049	-0.048	-0.047	-0.045	-0.041	-0.043	-0.044	-0.050	-0.051	-0.047	-0.034	-0.028	-0.024	-0.021	-0.018	-0.015	-0.014	-0.011	-0.009	-0.007	-0.004

HALTECH SPORT AND PLATINUM
43.5 PSI / 3 BAR / 300 kPa

INJ FLOW RATE (cc/min)	470
------------------------	-----

Voltage	8.300	8.500	8.800	9.000	9.300	9.500	9.800	10.000	10.300	10.500	10.800	11.000	11.300	11.500	11.800	12.000	12.300	12.500	12.800	13.000	13.300	13.500	13.800	14.000	14.300	14.500	14.800	15.000	15.300	15.500	15.800	16.000
Offset ms	1.438	1.391	1.344	1.297	1.256	1.215	1.174	1.133	1.097	1.061	1.025	0.990	0.958	0.927	0.896	0.865	0.837	0.810	0.783	0.755	0.731	0.707	0.684	0.660	0.639	0.618	0.597	0.576	0.558	0.540	0.522	0.503

58 PSI / 4 BAR / 400 kPa

INJ FLOW RATE (cc/min)	539
------------------------	-----

Voltage	8.300	8.500	8.800	9.000	9.300	9.500	9.800	10.000	10.300	10.500	10.800	11.000	11.300	11.500	11.800	12.000	12.300	12.500	12.800	13.000	13.300	13.500	13.800	14.000	14.300	14.500	14.800	15.000	15.300	15.500	15.800	16.000
Offset ms	1.564	1.513	1.462	1.411	1.367	1.322	1.277	1.233	1.194	1.155	1.116	1.077	1.043	1.009	0.975	0.941	0.911	0.881	0.852	0.822	0.796	0.770	0.744	0.718	0.695	0.672	0.650	0.627	0.607	0.587	0.568	0.548



FUEL INJECTOR CHARACTERIZATION

HOLLEY TERMINATOR/DOMINATOR INJECTOR DATA 30522-1 & 30522-8

43.5 PSI / 3 BAR / 300 kPa

RATED FLOW PER INJECTOR (lb/hr)				44.86		INJECTOR TYPE				High Impedance		MIN INJECTOR OPENING TIME				0.482	
INJECTOR OFF TIME																	
Voltage	8.0	8.8	9.6	10.4	11.2	12.0	12.8	13.6	14.4	15.2	16.0	16.8	17.6	18.4	19.2	20.0	
Off Time	1.48	1.33	1.20	1.07	0.96	0.86	0.78	0.70	0.62	0.56	0.50	0.45	0.41	0.36	0.33	0.29	

58 PSI / 4 BAR / 400 kPa

RATED FLOW PER INJECTOR (lb/hr)				51.46		INJECTOR TYPE				High Impedance		MIN INJECTOR OPENING TIME (ms)				0.482	
INJECTOR OFF TIME																	
Voltage	8.0	8.8	9.6	10.4	11.2	12.0	12.8	13.6	14.4	15.2	16.0	16.8	17.6	18.4	19.2	20.0	
Off Time	1.62	1.45	1.30	1.17	1.05	0.94	0.84	0.76	0.68	0.61	0.55	0.49	0.44	0.40	0.36	0.32	



FUEL INJECTOR CHARACTERIZATION
LINK ECU INJECTOR DATA 30522-1 & 30522-8

43.5 PSI / 3 BAR / 300 kPa

INJECTOR FLOW AT RATED PRESSURE (cc/min)										470		MINIMUM PULSE WIDTH (ms)										0.482											
INJECTOR DEAD TIME (ms)																																	
Voltage	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22																	
Dead Time	1.641	1.463	1.297	1.144	1.003	0.876	0.761	0.658	0.569	0.492	0.428	0.376	0.337	0.311	0.298	0.293																	
SHORT PULSE WIDTH ADDER (ms)																																	
PulseWidth	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875	1.000	1.125	1.250	1.375	1.500	1.625	1.750	1.875	2.000	2.125	2.250	2.375	2.500	2.625	2.750	2.875	3.000	3.125	3.250	3.375	3.500	3.625	3.750	3.875	4.000
Modifier	0.000	0.217	0.149	0.081	0.033	0.004	-0.022	-0.043	-0.052	-0.049	-0.048	-0.046	-0.041	-0.044	-0.048	-0.052	-0.047	-0.031	-0.025	-0.021	-0.018	-0.015	-0.012	-0.010	-0.007	-0.004	-0.001	0.000	0.000	0.000	0.000	0.000	0.000

58 PSI / 4 BAR / 400 kPa

INJECTOR FLOW AT RATED PRESSURE (cc/min)										539					MINIMUM PULSE WIDTH (ms)										0.482								
INJECTOR DEAD TIME (ms)																																	
Voltage	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22																	
Dead Time	1.786	1.592	1.411	1.245	1.092	0.953	0.828	0.716	0.619	0.535	0.465	0.409	0.367	0.339	0.324	0.319																	
SHORT PULSE WIDTH ADDER (ms)																																	
PulseWidth	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875	1.000	1.125	1.250	1.375	1.500	1.625	1.750	1.875	2.000	2.125	2.250	2.375	2.500	2.625	2.750	2.875	3.000	3.125	3.250	3.375	3.500	3.625	3.750	3.875	4.000
Modifier	0.000	0.217	0.149	0.081	0.033	0.004	-0.022	-0.043	-0.052	-0.049	-0.048	-0.046	-0.041	-0.044	-0.048	-0.052	-0.047	-0.031	-0.025	-0.021	-0.018	-0.015	-0.012	-0.010	-0.007	-0.004	-0.001	0.000	0.000	0.000	0.000	0.000	0.000



FUEL INJECTOR CHARACTERIZATION
MEGASQUIRT/TUNERSTUDIO INJECTOR DATA 30522-1 & 30522-8

You may input one or both curves, but only select the one that matches your base fuel system spressure.
Injector Parameters should be set to SAME

43.5 PSI / 3 BAR / 300 kPa

INJECTOR SIZE EACH (cc)		470
BATTERY OFFSET		
Curve 1		
7.2		165.4
9.6		119.6
12.0		86.5
14.4		62.5
16.8		45.2
19.2		32.7
BANK 1 Dead-Time @ 100%(ms)		1.000

58 PSI / 4 BAR / 400 kPa

INJECTOR SIZE EACH (cc)		539
BATTERY OFFSET		
Curve 2		
7.2		180.0
9.6		130.1
12.0		94.1
14.4		68.0
16.8		49.2
19.2		35.5
BANK 1 Dead-Time @ 100%(ms)		1.000

INJECTOR SMALL PULSEWIDTHS						
New (ms)	0.000	0.564	0.857	1.222	1.591	2.000
Original (ms)	0.000	0.540	0.905	1.270	1.635	2.000

USE BELOW IF USING A PNP ECU

43.5 PSI / 3 BAR / 300 kPa

BATTERY OFFSET	
Voltage	Offset (ms)
6.0	1.833
8.0	1.463
10.0	1.144
12.0	0.876
14.0	0.658
16.0	0.492

58 PSI / 4 BAR / 400 kPa

BATTERY OFFSET	
Voltage	Offset (ms)
6.0	1.994
8.0	1.592
10.0	1.245
12.0	0.953
14.0	0.716
16.0	0.535



FUEL INJECTOR CHARACTERIZATION
EMTRON INJECTOR DATA 30522-1 & 30522-8

REF INJECTOR SIZE (Primary)	
Ref injector size (300 kPa)	470 cc/min
Ref injector size (400 kPa)	539 cc/min
Ref injector size (500 kPa)	602 cc/min

INJECTOR DEADTIME TABLE (ms)							
Voltage		6.0	8.0	10.0	12.0	14.0	16.0
Fuel Pressure 1 Diff (kPa)	300.0	1.833	1.485	1.133	0.865	0.660	0.503
	310.2	1.847	1.497	1.142	0.872	0.665	0.508
	344.7	1.906	1.544	1.178	0.899	0.686	0.523
	379.2	1.964	1.591	1.214	0.926	0.707	0.539
	413.7	2.022	1.638	1.250	0.954	0.728	0.555
	448.2	2.080	1.685	1.286	0.981	0.749	0.571
	482.7	2.138	1.732	1.322	1.009	0.770	0.587
	517.2	2.197	1.779	1.358	1.036	0.791	0.603
	551.7	2.255	1.827	1.394	1.064	0.812	0.619
	587.2	2.315	1.875	1.431	1.092	0.833	0.636
	620.7	2.371	1.921	1.466	1.119	0.854	0.651

INJECTOR LINEARISATION TABLE (ms)															
0.000	0.125	0.250	0.375	0.500	0.750	1.000	1.250	1.500	1.750	2.000	2.250	2.500	2.750	3.000	3.250
0.000	0.217	0.149	0.081	0.033	-0.022	-0.052	-0.048	-0.041	-0.048	-0.047	-0.025	-0.018	-0.012	-0.007	-0.001



FUEL INJECTOR CHARACTERIZATION
MAXX ECU INJECTOR DATA 30522-1 & 30522-8

43.5 PSI / 3 BAR / 300 kPa

INJECTOR FLOW AT RATED PRESSURE (cc/min)	470
MINIMUM PULSE WIDTH (ms)	0.482

INJECTOR DEAD TIME (ms)						
Voltage	8	10	12	14	16	18
Dead Time	1.485	1.133	0.865	0.660	0.503	0.376

SHORT PULSE WIDTH ADDER (ms)																													
Modifier	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875	1.000	1.125	1.250	1.375	1.500	1.625	1.750	1.875	2	2.125	2.250	2.375	2.500	2.625	2.75	2.875	3.000	3.125	3.250	3.375	3.5
Pulse Width	0.000	0.217	0.149	0.081	0.033	0.004	-0.022	-0.043	-0.052	-0.049	-0.048	-0.046	-0.041	-0.044	-0.048	-0.052	-0.047	-0.031	-0.025	-0.021	-0.018	-0.015	-0.012	-0.010	-0.007	-0.004	-0.001	0.000	0.000

58 PSI / 4 BAR / 400 kPa

INJECTOR FLOW AT RATED PRESSURE (cc/min)	539
MINIMUM PULSE WIDTH (ms)	0.482

INJECTOR DEAD TIME (ms)						
Voltage	8	10	12	14	16	18
Dead Time	1.615	1.233	0.941	0.718	0.548	0.409

SHORT PULSE WIDTH ADDER (MS)																													
Modifier	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875	1.000	1.125	1.250	1.375	1.500	1.625	1.750	1.875	2	2.125	2.250	2.375	2.500	2.625	2.75	2.875	3.000	3.125	3.250	3.375	3.5
Pulse Width	0.000	0.217	0.149	0.081	0.033	0.004	-0.022	-0.043	-0.052	-0.049	-0.048	-0.046	-0.041	-0.044	-0.048	-0.052	-0.047	-0.031	-0.025	-0.021	-0.018	-0.015	-0.012	-0.010	-0.007	-0.004	-0.001	0.000	0.000



FUEL INJECTOR CHARACTERIZATION
MOTEC INJECTOR DATA 30522-1 & 30522-8

RESISTANCE (Ω)	12.20 Ohm
PEAK CURRENT	4.00 Amp
HOLD CURRENT	0.30 Amp
PEAK TIME	7.00 ms
OFF TIME	Not Available
PIN DRIVE	Saturated
MINIMUM VOLUME	1.00 µl
REF FLOW (300 kPa)	7.96 ml/s
REF FLOW (400 kPa)	9.37 ml/s
REF FLOW (500 kPa)	10.52 ml/s
REF FLOW (600 kPa)	11.43 ml/s

Pulse widths (ms), depended on voltage (V), fuel differential pressure (horizontal, kPa) and fuel volume (vertical, µl)

8 VOLT

M1	v2	Fuel Pressure Differential		
Body	ms	Fuel Cylinder 1 Output Pulse Volume		
Cols	dkPa	Fuel Cylinder 1 Output Pulse Volume		
Rows	ul	Fuel Cylinder 1 Output Pulse Volume		
	300	400	500	600
1.00	2.049	2.204	2.366	2.571
2.00	2.095	2.256	2.414	2.633
3.00	2.161	2.299	2.465	2.662
4.00	2.255	2.366	2.520	2.701
5.00	2.332	2.443	2.583	2.749
6.00	2.447	2.506	2.647	2.813
7.00	2.566	2.606	2.706	2.868
8.00	2.686	2.713	2.801	2.945
9.00	2.812	2.818	2.897	3.024
10.00	2.938	2.922	2.982	3.112
11.00	3.070	3.028	3.082	3.200
12.00	3.205	3.139	3.177	3.288
13.00	3.334	3.251	3.272	3.373
14.00	3.463	3.363	3.368	3.459
15.00	3.592	3.475	3.469	3.545
16.00	3.721	3.587	3.569	3.631
17.00	3.852	3.698	3.668	3.723
18.00	3.983	3.809	3.767	3.814
19.00	4.115	3.920	3.865	3.906
20.00	4.247	4.032	3.964	3.998

10 VOLT

M1	v2	Fuel Pressure Differential		
Body	ms	Fuel Cylinder 1 Output Pulse Volume		
Cols	dkPa	Fuel Cylinder 1 Output Pulse Volume		
Rows	ul	Fuel Cylinder 1 Output Pulse Volume		
	300	400	500	600
1.00	1.545	1.636	1.732	1.834
2.00	1.584	1.672	1.777	1.881
3.00	1.651	1.698	1.817	1.915
4.00	1.748	1.794	1.869	1.932
5.00	1.830	1.871	1.944	2.026
6.00	1.943	1.944	1.994	2.085
7.00	2.057	2.044	2.069	2.136
8.00	2.180	2.144	2.164	2.218
9.00	2.303	2.249	2.257	2.301
10.00	2.425	2.355	2.352	2.388
11.00	2.547	2.460	2.446	2.475
12.00	2.694	2.566	2.538	2.562
13.00	2.821	2.679	2.634	2.648
14.00	2.948	2.792	2.730	2.734
15.00	3.076	2.905	2.836	2.820
16.00	3.205	3.020	2.943	2.906
17.00	3.337	3.131	3.036	3.005
18.00	3.469	3.239	3.137	3.098
19.00	3.601	3.348	3.237	3.191
20.00	3.733	3.457	3.338	3.285

12 VOLT

M1	v2	Fuel Pressure Differential		
Body	ms	Fuel Cylinder 1 Output Pulse Volume		
Cols	dkPa	Fuel Cylinder 1 Output Pulse Volume		
Rows	ul	Fuel Cylinder 1 Output Pulse Volume		
	300	400	500	600
1.00	1.245	1.309	1.374	1.446
2.00	1.279	1.340	1.411	1.480
3.00	1.324	1.363	1.446	1.505
4.00	1.441	1.485	1.504	1.527
5.00	1.525	1.533	1.575	1.616
6.00	1.638	1.616	1.626	1.679
7.00	1.754	1.713	1.719	1.752
8.00	1.875	1.811	1.810	1.833
9.00	2.001	1.919	1.898	1.915
10.00	2.128	2.028	1.995	2.003
11.00	2.254	2.137	2.094	2.091
12.00	2.393	2.246	2.194	2.179
13.00	2.520	2.357	2.284	2.265
14.00	2.647	2.469	2.375	2.351
15.00	2.773	2.580	2.480	2.437
16.00	2.900	2.691	2.585	2.523
17.00	3.043	2.802	2.683	2.616
18.00	3.177	2.912	2.782	2.708
19.00	3.312	3.026	2.880	2.800
20.00	3.447	3.152	2.979	2.893



FUEL INJECTOR CHARACTERIZATION
MOTEC INJECTOR DATA 30522-1 & 30522-8
(continued)

14 VOLT

M1	v2			
Body	ms	Fuel Pressure Differential		
Cols	dkPa	Fuel Cylinder 1 Output Pulse Volume		
Rows	ul			
	300	400	500	600
1.00	1.046	1.096	1.146	1.202
2.00	1.076	1.123	1.186	1.231
3.00	1.127	1.145	1.226	1.256
4.00	1.232	1.266	1.278	1.305
5.00	1.324	1.317	1.346	1.369
6.00	1.433	1.400	1.403	1.427
7.00	1.542	1.497	1.480	1.496
8.00	1.665	1.594	1.572	1.578
9.00	1.792	1.701	1.663	1.660
10.00	1.919	1.808	1.761	1.748
11.00	2.046	1.914	1.857	1.835
12.00	2.190	2.022	1.954	1.922
13.00	2.318	2.136	2.050	2.010
14.00	2.446	2.250	2.147	2.098
15.00	2.574	2.364	2.249	2.185
16.00	2.703	2.479	2.351	2.273
17.00	2.837	2.590	2.450	2.365
18.00	2.972	2.700	2.549	2.457
19.00	3.108	2.811	2.648	2.548
20.00	3.243	2.920	2.747	2.639

16 VOLT

M1	v2			
Body	ms	Fuel Pressure Differential		
Cols	dkPa	Fuel Cylinder 1 Output Pulse Volume		
Rows	ul			
	300	400	500	600
1.00	0.916	0.944	0.980	1.020
2.00	0.932	0.987	1.020	1.078
3.00	1.016	0.998	1.100	1.090
4.00	1.087	1.101	1.156	1.112
5.00	1.163	1.150	1.254	1.225
6.00	1.277	1.237	1.260	1.247
7.00	1.384	1.331	1.300	1.309
8.00	1.510	1.430	1.400	1.386
9.00	1.641	1.537	1.500	1.467
10.00	1.761	1.645	1.565	1.545
11.00	1.887	1.754	1.682	1.641
12.00	2.024	1.847	1.780	1.727
13.00	2.165	1.968	1.870	1.817
14.00	2.297	2.084	1.963	1.907
15.00	2.423	2.206	2.069	1.988
16.00	2.551	2.321	2.174	2.082
17.00	2.677	2.426	2.275	2.175
18.00	2.802	2.533	2.369	2.270
19.00	2.934	2.640	2.467	2.369
20.00	3.064	2.749	2.564	2.460



FUEL INJECTOR CHARACTERIZATION
MOTEC INJECTOR DATA 30522-1 & 30522-8
(continued)

Pulse widths (ms), depended on voltage (V), fuel differential pressure (horizontal, kPa) and fuel volume (vertical, µl)

300 kPa

	8	10	12	14	15
1.00	2.049	1.545	1.245	1.046	0.916
2.00	2.095	1.584	1.279	1.076	0.932
3.00	2.161	1.651	1.324	1.127	1.016
4.00	2.255	1.748	1.441	1.232	1.087
5.00	2.332	1.830	1.525	1.324	1.163
6.00	2.447	1.943	1.638	1.433	1.277
7.00	2.566	2.057	1.754	1.542	1.384
8.00	2.686	2.180	1.875	1.665	1.510
9.00	2.812	2.303	2.001	1.792	1.641
10.00	2.938	2.425	2.128	1.919	1.761
11.00	3.070	2.547	2.254	2.046	1.887
12.00	3.205	2.694	2.393	2.190	2.024
13.00	3.334	2.821	2.520	2.318	2.165
14.00	3.463	2.948	2.647	2.446	2.297
15.00	3.592	3.076	2.773	2.574	2.423
16.00	3.721	3.205	2.900	2.703	2.551
17.00	3.852	3.337	3.043	2.837	2.677
18.00	3.983	3.469	3.177	2.972	2.802
19.00	4.115	3.601	3.312	3.108	2.934
20.00	4.247	3.733	3.447	3.243	3.064

400 kPa

	8	10	12	14	15
1.00	2.204	1.636	1.309	1.096	0.944
2.00	2.256	1.672	1.340	1.123	0.987
3.00	2.299	1.698	1.363	1.145	0.998
4.00	2.366	1.794	1.485	1.266	1.101
5.00	2.443	1.871	1.533	1.317	1.150
6.00	2.506	1.944	1.616	1.400	1.237
7.00	2.606	2.044	1.713	1.497	1.331
8.00	2.713	2.144	1.811	1.594	1.430
9.00	2.818	2.249	1.919	1.701	1.537
10.00	2.922	2.355	2.028	1.808	1.645
11.00	3.028	2.460	2.137	1.914	1.754
12.00	3.139	2.566	2.246	2.022	1.847
13.00	3.251	2.679	2.357	2.136	1.968
14.00	3.363	2.792	2.469	2.250	2.084
15.00	3.475	2.905	2.580	2.364	2.206
16.00	3.587	3.020	2.691	2.479	2.321
17.00	3.698	3.131	2.802	2.590	2.426
18.00	3.809	3.239	2.912	2.700	2.533
19.00	3.920	3.348	3.026	2.811	2.640
20.00	4.032	3.457	3.152	2.920	2.749



FUEL INJECTOR CHARACTERIZATION
MOTEC INJECTOR DATA 30522-1 & 30522-8
(continued)

500 kPa

	8	10	12	14	15
1.00	2.366	1.732	1.374	1.146	0.980
2.00	2.414	1.777	1.411	1.186	1.020
3.00	2.465	1.817	1.446	1.226	1.100
4.00	2.520	1.869	1.504	1.278	1.156
5.00	2.583	1.944	1.575	1.346	1.254
6.00	2.647	1.994	1.626	1.403	1.260
7.00	2.706	2.069	1.719	1.480	1.300
8.00	2.801	2.164	1.810	1.572	1.400
9.00	2.897	2.257	1.898	1.663	1.500
10.00	2.982	2.352	1.995	1.761	1.565
11.00	3.082	2.446	2.094	1.857	1.682
12.00	3.177	2.538	2.194	1.954	1.780
13.00	3.272	2.634	2.284	2.050	1.870
14.00	3.368	2.730	2.375	2.147	1.963
15.00	3.469	2.836	2.480	2.249	2.069
16.00	3.569	2.943	2.585	2.351	2.174
17.00	3.668	3.036	2.683	2.450	2.275
18.00	3.767	3.137	2.782	2.549	2.369
19.00	3.865	3.237	2.880	2.648	2.467
20.00	3.964	3.338	2.979	2.747	2.564

600 kPa

	8	10	12	14	15
1.00	2.571	1.834	1.446	1.202	1.020
2.00	2.633	1.881	1.480	1.231	1.078
3.00	2.662	1.915	1.505	1.256	1.090
4.00	2.701	1.932	1.527	1.305	1.112
5.00	2.749	2.026	1.616	1.369	1.225
6.00	2.813	2.085	1.679	1.427	1.247
7.00	2.868	2.136	1.752	1.496	1.309
8.00	2.945	2.218	1.833	1.578	1.386
9.00	3.024	2.301	1.915	1.660	1.467
10.00	3.112	2.388	2.003	1.748	1.545
11.00	3.200	2.475	2.091	1.835	1.641
12.00	3.288	2.562	2.179	1.922	1.727
13.00	3.373	2.648	2.265	2.010	1.817
14.00	3.459	2.734	2.351	2.098	1.907
15.00	3.545	2.820	2.437	2.185	1.988
16.00	3.631	2.906	2.523	2.273	2.082
17.00	3.723	3.005	2.616	2.365	2.175
18.00	3.814	3.098	2.708	2.457	2.270
19.00	3.906	3.191	2.800	2.548	2.369
20.00	3.998	3.285	2.893	2.639	2.460

All MoTec data supplied is provided via from MoTec from their in-house testing.



FUEL INJECTOR CHARACTERIZATION
FUELTECH INJECTOR DATA 30522-1 & 30522-8

43.5 PSI / 3 BAR / 300 kPa

INPUT AMOUNT OF CYLINDERS/ROTORS	4.00 Cyl/Rotors
PRIMARY/SECONDARY TOTAL FLOW	179.45 lb.hr
SINGLE INJECTOR FLOW	44.86 lb/hr

INJECTOR OFF TIME									
Voltage	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0
Off Time	1.485	1.297	1.133	0.990	0.865	0.755	0.660	0.576	0.503

58 PSI / 4 BAR / 400 kPa

INPUT AMOUNT OF CYLINDERS/ROTORS	4.00 Cyl/Rotors
PRIMARY/SECONDARY TOTAL FLOW	205.85 lb.hr
SINGLE INJECTOR FLOW	51.46 lb/hr

INJECTOR OFF TIME									
Voltage	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0
Off Time	1.615	1.411	1.233	1.077	0.941	0.822	0.718	0.627	0.548



FUEL INJECTOR CHARACTERIZATION
ACES INJECTOR DATA 30522-1 & 30522-8

43.5 PSI / 3 BAR / 300 kPa

RATED FLOW PER INJECTOR (mg/s): 5652.45

INJECTOR MINIMUM PULSEWIDTH (Min Fuel PW)								
Voltage	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0
Time(μs)	482.13	482.13	482.13	482.13	482.13	482.13	482.13	482.13

INJECTOR OFF TIME								
Voltage	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0
Time(μs)	1832.64	1735.44	1641.41	1550.55	1462.87	1378.37	1297.04	1218.89



FUEL INJECTOR CHARACTERIZATION
UNIVERSAL INJECTOR DATA 30522-1 & 30522-8

INJECTOR FLOW RATE VS. PRESSURE

Pressure Bar	1	2	3	3.5	4	5	6	7	8
Pressure kPa	100	200	300	350	400	500	600	700	800
Pressure psi	14.5	29	43.5	58	58	72.5	87	101.5	116
Flowrate cc/min	338	404	470	504	539	602	670	736	802
Flowrate lb/hr	32.3	38.6	44.9	48.2	51.5	57.5	64.0	70.3	76.6
Flowrate g/s	4.07	4.87	5.65	6.07	6.48	7.25	8.06	8.86	9.66

BATTERY OFFSET VS. VOLTAGE VS PRESSURE

Pressure Bar		1	2	3	3.5	4	5	6	7	8
Pressure kPa		100	200	300	350	400	500	600	700	800
Pressure psi		14.5	29	43.5	43.5	58	72.5	87	101.5	116
Voltage	4.0	1.836	2.043	2.253	2.452	2.668	2.872	3.080	3.287	3.495
	4.5	1.746	1.943	2.143	2.332	2.538	2.732	2.930	3.127	3.324
	5.0	1.659	1.846	2.037	2.216	2.411	2.596	2.784	2.971	3.159
	5.5	1.575	1.753	1.933	2.103	2.289	2.464	2.642	2.820	2.998
	6.0	1.493	1.662	1.833	1.994	2.170	2.336	2.505	2.674	2.842
	6.5	1.414	1.573	1.735	1.888	2.055	2.212	2.372	2.532	2.692
	7.0	1.337	1.488	1.641	1.786	1.944	2.093	2.244	2.395	2.546
	7.5	1.263	1.406	1.551	1.687	1.836	1.977	2.119	2.262	2.405
	8.0	1.192	1.326	1.463	1.592	1.732	1.865	2.000	2.134	2.269
	8.5	1.123	1.250	1.378	1.500	1.632	1.757	1.884	2.011	2.138
	9.0	1.057	1.176	1.297	1.411	1.536	1.654	1.773	1.892	2.012
	9.5	0.993	1.105	1.219	1.326	1.443	1.554	1.666	1.778	1.890
	10.0	0.932	1.037	1.144	1.245	1.354	1.458	1.564	1.669	1.774
	10.5	0.873	0.972	1.072	1.167	1.269	1.367	1.465	1.564	1.663
	11.0	0.817	0.910	1.003	1.092	1.188	1.279	1.372	1.464	1.556
	11.5	0.764	0.850	0.938	1.021	1.111	1.196	1.282	1.369	1.455
	12.0	0.713	0.794	0.876	0.953	1.037	1.116	1.197	1.278	1.358
	12.5	0.665	0.740	0.817	0.889	0.967	1.041	1.116	1.191	1.267
	13.0	0.620	0.690	0.761	0.828	0.901	0.970	1.040	1.110	1.180
	13.5	0.577	0.642	0.708	0.770	0.838	0.903	0.968	1.033	1.098
	14.0	0.536	0.597	0.658	0.716	0.780	0.839	0.900	0.961	1.021
	14.5	0.499	0.555	0.612	0.666	0.725	0.780	0.837	0.893	0.949
	15.0	0.463	0.516	0.569	0.619	0.673	0.725	0.777	0.830	0.882
	15.5	0.431	0.479	0.529	0.575	0.626	0.674	0.723	0.771	0.820
	16.0	0.401	0.446	0.492	0.535	0.582	0.627	0.672	0.718	0.763
	16.5	0.373	0.415	0.458	0.499	0.543	0.584	0.626	0.668	0.711
	17.0	0.348	0.388	0.428	0.465	0.506	0.545	0.585	0.624	0.663
	17.5	0.326	0.363	0.400	0.436	0.474	0.510	0.547	0.584	0.621
	18.0	0.306	0.341	0.376	0.409	0.445	0.480	0.514	0.549	0.583
	18.5	0.289	0.322	0.355	0.386	0.421	0.453	0.485	0.518	0.551
	19.0	0.275	0.306	0.337	0.367	0.399	0.430	0.461	0.492	0.523
	19.5	0.263	0.293	0.323	0.351	0.382	0.411	0.441	0.471	0.500
	20.0	0.247	0.275	0.303	0.330	0.359	0.386	0.414	0.442	0.470