Technical Bulletin

Model(s)	Year	Eng. Code	Trans. Code	VIN Range From	VIN Range To
All	2000 - 2010	All	All	All	All

Condition

27 07 11 October 2, 2007 **2016076**, Supersedes Technical Bulletin Group 27 number 07-10 dated September 18, 2007 due to clarification

Battery, Discharged, Diagnosis for Excessive Static Current Draw

Technical Background

One or more of the following symptoms is possible.

- Discharged battery
- Engine does not start because of low battery voltage
- Voltage display in the combination instrument displays too low
- "Low battery" fault codes in various control modules.

Production Solution

Battery/ Current draw procedure introduced in VAS 5051A/B scan tool with the release of software version 11.78.00.

Service

ⓘ **Tip:**

Refer to ElsaWeb for other Technical Bulletins that apply to specific vehicles with discharged batteries. These Technical Bulletins provide information about intermittent faults and correct battery testing /charging procedures.

Ⓘ **Note:**

Perform **ALL STEPS**, to systematically test for faults and to avoid repeat repairs.

Ⓘ **Note:**

The power supply to vehicle must not be cut off. **DO NOT** perform terminal 30 reset. **DO NOT** remove or disconnect battery, battery cables or fuses.

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Check the fault memory.

- Compare control units on the fault memory print-out with vehicle equipment (PR numbers). Are all necessary control units listed on the print-out? Any control units not listed may be faulty and could be indications for the further fault finding.

- Check which non-genuine parts are installed, e.g. tow bar, animal protection, radio, DVD, etc. If an increased closed-circuit current is found, check these components first.

Step 1: Verify Battery Condition

1. Connect Midtronics INC-940 to battery
2. Check and/or charge battery based on applicable Technical Bulletin
3. If INC-940 test fails battery, replace battery before continuing

Step 2: Verify Sleep State Current

1. Connect 50 amp current clamp to VAS 5051A/B
2. Calibrate the current clamp
3. Connect current clamp to negative battery cable with arrow pointing away from battery.

🛈 **Tip:**

Current flows out of the battery to the chassis of the vehicle

4. Close all doors, trunk, or hood latch so vehicle control units detect all doors closed
5. Arm vehicle anti-theft system with remote

🛈 **Tip:**

- If vehicle has easy entry handles then it is necessary to keep clear of all handles to avoid bus communication/wakeup message.

- On vehicles equipped with air suspension, after engine is turned off, the system will stay in standby for up to five minutes

6. Observe sleep state current draw after vehicle is left untouched for **TWO HOURS**.

Vehicle:	Phaeton	All other models
Nominal sleep current:	50 mA	40 mA

7. If after two hours the vehicle exceeds maximum sleep state current draw, proceed to **Step 3: Consuming Circuit Isolation**. If vehicle does not exceed maximum sleep state current draw, perform a long term (overnight) measurement test. Record the *long term measurement* using MIN/MAX setting of scan tool.

- Excessive current = Measured current > nominal sleep current

ℹ️ Tip:

Periodic spikes in current draw are normal

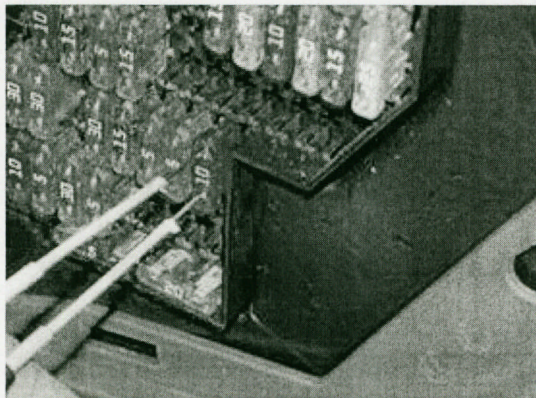### Step 3: Consuming Circuit Isolation

ℹ️ Tip:

Due to the state of the CAN Bus communications in the vehicle, it is no longer acceptable to pull each individual fuse one at a time to try and identify which circuit is consuming current. Removal/ reinsertion of a fuse while vehicle is in a sleep state may wake the bus of the vehicle, and invalidate the test. Identifying "consuming" circuits must be done by measuring a voltage drop across fuse and aligning with the value in matrix located at end of this document.

Starting at interior fuse boxes, perform the following tasks:

ℹ️ Tip:

Use VAS 5051A/B multimeter function, Fluke 83 multimeter, or equivalent.

- Use "mV" scale on meter
- Measure voltage drop across fuse by placing the positive lead on one side of the fuse and negative lead on other side.

- Take absolute value of reading of voltage drop (ignore negative signs) and then reference voltage drop chart to determine how much current the circuit is currently consuming. See **Identifying Current Consumption with Matrix** attachment.
- Check all fuses until fuse with approximate excessive current draw is identified

ℹ️ Tip:

Excessive current = Measured current > nominal sleep current

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Identification of component:

1. Once fused circuit is identified, use service repair and wiring diagram information in ElsaWeb to identify all components on circuit

2. Disconnect components from the circuit one by one and allow sleep current to stabilize after each elimination.

3. Measure vehicle current consumption and voltage drop across fuse once again. If within normal range, as specified in the table (see **Current Consumption Matrix** attachment), the component with excessive consumption is identified.

4. Repeat steps above until component is identified causing excessive current draw.

Warranty

Information only.

Required Parts and Tools

No Special Parts required.
No Special Tools required.

Additional Information

All part and service references provided in this Technical Bulletin are subject to change and/or removal. Always check with your Parts Dept. and Repair Manuals for the latest information.

Identifying Current Consumption with Matrix

- What is needed:
  - Measured voltage drop across fuse in mV
  - Fuse type
  - Fuse rating

Measurement	Mini	Mini	Mini	Standard	Standard	Standard	Standard	Standard	Standard
mV	5	7.5	10	5	10	15	20	25	30
0.1	6	10	14	7	13	23	30	47	62
0.2	12	20	28	13	27	45	61	94	123
0.3	18	30	43	20	40	68	91	141	185
0.4	24	40	57	26	54	91	122	188	246
0.5	30	50	71	33	67	113	152	235	308

← Fuse type

← Fuse rating

← 20 mA

Measured voltage drop across fuse

Example:
- Measured voltage drop = .3 mV
- Fuse type = Standard
- Fuse rating = 5 A

Current consumption through circuit = 20 mA

Current Consumption Matrix

Measurement	Mini	Mini	Mini	Standard	Standard	Standard	Standard	Standard	Standard
mV	5	7.5	10	5	10	15	20	25	30
0.1	6	10	14	7	13	23	30	47	62
0.2	12	20	28	13	27	45	61	94	123
0.3	18	30	43	20	40	68	91	141	185
0.4	24	40	57	26	54	91	122	188	246
0.5	30	50	71	33	67	113	152	235	308
0.6	36	60	85	40	80	136	183	281	370
0.7	42	70	99	46	94	158	213	328	431
0.8	48	80	114	53	107	181	244	375	493
0.9	54	90	128	59	120	204	274	422	554
1	60	100	142	66	134	226	305	469	616
1.1	66	110	156	73	147	249	335	516	677
1.2	72	120	171	79	161	272	366	563	739
1.3	78	130	185	86	174	294	396	610	801
1.4	84	140	199	92	187	317	427	657	862
1.5	90	150	213	99	201	340	457	704	924
1.6	96	160	227	106	214	362	487	751	985
1.7	102	169	242	112	228	385	518	797	1047
1.8	108	179	256	119	241	407	548	844	1109
1.9	114	189	270	125	254	430	579	891	1170
2	120	199	284	132	268	453	609	938	1232
2.1	126	209	298	139	281	475	640	985	1293
2.2	132	219	313	145	294	498	670	1032	1355
2.3	138	229	327	152	308	521	701	1079	1417
2.4	144	239	341	158	321	543	731	1126	1478
2.5	150	249	355	165	335	566	762	1173	1540
2.6	156	259	369	172	348	589	792	1220	1601
2.7	162	269	384	178	361	611	823	1267	1663
2.8	168	279	398	185	375	634	853	1313	1725
2.9	174	289	412	192	388	656	884	1360	1786
3	180	299	426	198	401	679	914	1407	1848
3.1	186	309	441	205	415	702	944	1454	1909
3.2	192	319	455	211	428	724	975	1501	1971
3.3	198	329	469	218	442	747	1005	1548	2032
3.4	204	339	483	225	455	770	1036	1595	2094
3.5	210	349	497	231	468	792	1066	1642	2156
3.6	216	359	512	238	482	815	1097	1689	2217
3.7	222	369	526	244	495	837	1127	1736	2279
3.8	228	379	540	251	509	860	1158	1782	2340
3.9	234	389	554	258	522	883	1188	1829	2402
4	240	399	568	264	535	905	1219	1876	2464
4.1	246	409	583	271	549	928	1249	1923	2525
4.2	252	419	597	277	562	951	1280	1970	2587
4.3	258	429	611	284	575	973	1310	2017	2648
4.4	264	439	625	291	589	996	1341	2064	2710
4.5	270	449	639	297	602	1019	1371	2111	2772
4.6	276	459	654	304	616	1041	1401	2158	2833
4.7	282	469	668	310	629	1064	1432	2205	2895
4.8	288	479	682	317	642	1086	1462	2252	2956
4.9	294	488	696	324	656	1109	1493	2298	3018

Measurement mV	Mini 5	Mini 7.5	Mini 10	Standard 5	Standard 10	Standard 15	Standard 20	Standard 25	Standard 30
5	300	498	711	330	669	1132	1523	2345	3080
5.1	306	508	725	337	683	1154	1554	2392	3141
5.2	312	518	739	343	696	1177	1584	2439	3203
5,3	318	528	753	350	709	1200	1615	2486	3264
5,4	324	538	767	357	723	1222	1645	2533	3326
5,5	330	548	782	363	736	1245	1676	2580	3387
5,6	336	558	796	370	749	1268	1706	2627	3449
5,7	342	568	810	376	763	1290	1737	2674	3511
5,8	348	578	824	383	776	1313	1767	2721	3572
5,9	354	588	838	390	790	1335	1798	2768	3634
6	360	598	853	396	803	1358	1828	2814	3695
6.1	366	608	867	403	816	1381	1858	2861	3757
6.2	372	618	881	409	830	1403	1889	2908	3819
6.3	378	628	895	416	843	1426	1919	2955	3880
6.4	384	638	909	423	857	1449	1950	3002	3942
6.5	390	648	924	429	870	1471	1980	3049	4003
6.6	396	658	938	436	883	1494	2011	3096	4065
6.7	402	668	952	442	897	1517	2041	3143	4127
6.8	408	678	966	449	910	1539	2072	3190	4188
6.9	414	688	981	456	923	1562	2102	3237	4250
7	420	698	995	462	937	1584	2133	3284	4311
7.1	426	708	1009	469	950	1607	2163	3330	4373
7.2	432	718	1023	475	964	1630	2194	3377	4434
7.3	438	728	1037	482	977	1652	2224	3424	4496
7.4	444	738	1052	489	990	1675	2255	3471	4558
7.5	450	748	1066	495	1004	1698	2285	3518	4619
7.6	456	758	1080	502	1017	1720	2315	3565	4681
7.7	462	768	1094	508	1030	1743	2346	3612	4742
7.8	468	778	1108	515	1044	1766	2376	3659	4804
7.9	474	788	1123	522	1057	1788	2407	3706	4866
8	480	798	1137	528	1071	1811	2437	3753	4927
8.1	486	807	1151	535	1084	1833	2468	3800	4989
8.2	492	817	1165	541	1097	1856	2498	3846	5050
8.3	498	827	1179	548	1111	1879	2529	3893	5112
8.4	504	837	1194	555	1124	1901	2559	3940	5174
8.5	510	847	1208	561	1138	1924	2590	3987	5235
8.6	516	857	1222	568	1151	1947	2620	4034	5297
8.7	522	867	1236	575	1164	1969	2651	4081	5358
8.8	528	877	1251	581	1178	1992	2681	4128	5420
8.9	534	887	1265	588	1191	2015	2712	4175	5482
9	540	897	1279	594	1204	2037	2742	4222	5543
9.1	546	907	1293	601	1218	2060	2772	4269	5605
9.2	552	917	1307	608	1231	2082	2803	4316	5666
9.3	558	927	1322	614	1245	2105	2833	4362	5728
9.4	564	937	1336	621	1258	2128	2864	4409	5789
9.5	570	947	1350	627	1271	2150	2894	4456	5851
9.6	576	957	1364	634	1285	2173	2925	4503	5913
9.7	582	967	1378	641	1298	2196	2955	4550	5974
9.8	588	977	1393	647	1312	2218	2986	4597	6036
9.9	594	987	1407	654	1325	2241	3016	4644	6097
10	600	997	1421	660	1338	2263	3047	4691	6159