

### The PIN or SKC in the VW and Audi Immobilizer

For the sake of simplicity, we'll refer this 5 digit code as the PIN. The best example is the debit or credit card. A PIN (Personal Identification Number) is assigned by the user or by the banking institution. In this discussion, the PIN is assigned by the manufacturer. The theory is that no two PIN's will ever be assigned to more than one Immobilizer serial number. Refer to figure 1.

| <u>File D</u> asl  | n <u>I</u> m     | mo | Box | Opti | on <u>t</u> | <u>H</u> elp |      |     |    |     |    |     |     |    |    |    |    |                     |
|--|------------------|----|-----|------|-------------|--------------|------|-----|----|-----|----|-----|-----|----|----|----|----|---------------------|
| Offse  | t Ø              | 0  | 01  | 02   | 03          | 04           | 05   | 06  | 07 | 08  | 09 | ØA  | ØB  | 0C | ØD | 0E | ØF | ASCII               |
| 00000  | 0 0              | 9  | 00  | 00   | 00          | 00           | 00   | 00  | 00 | 00  | 00 | 00  | 00  | 00 | 00 | 00 | 00 |                     |
| 00001  | 00               | 9  | 00  | 00   | 00          | 00           | 00   | 00  | 00 | 00  | 00 | 00  | 00  | 00 | 00 | 00 | FF | ÿ                   |
| 00002  | 0 3              | E  | 80  | EA   | BE          | 3E           | 8E   | C 1 | 48 | 3E  | 8E | 64  | 69  | FF | FF | FF | FF | >∎ê¾>∎ÁJ>∎diÿÿÿÿ    |
| 00003  | 0 F              | F  | FF  | FF   | FF          | FF           | FF   | FF  | FF | FF  | FF | FF  | FF  | FF | FF | FF | FF | กักกกกักกกักกกกกกก  |
| 00004  | 0 <mark>C</mark> | 1  | 7F  | 15   | 41          | C 1          | 71   | 3E  | B5 | C 1 | 71 | 9 B | 96  | FF | FF | FF | FF | Á∎.AÁq>µÁq∎∎ÿÿÿÿ    |
| 00005  | 0 F              | F  | FF  | FF   | FF          | FF           | FF   | FF  | FF | FF  | FF | FF  | FF  | FF | FF | FF | FF | <u> </u>            |
| 00006  | 0 F              | F  | FF  | FF   | FF          | 08           | 80   | FF  | FF | FF  | FF | FF  | FF  | FF | FF | FF | FF | ŊŊŊŇ∙∎ŊŊŊŊŊŇŇŊŊŊ    |
| 00007  | 0 F              | F  | FF  | 70   | C 9         | DE           | 3B   | 74  | 03 | ЕÓ  | FF | 70  | C 9 | DE | 3B | 74 | 03 | ÿÿpÉÞ;t.æÿpÉÞ;t.    |
| 00008  | 0 E              | 6  | FF  | 70   | C 9         | DE           | 3B   | 74  | 03 | ЕÓ  | FF | 33  | 33  | 33 | 06 | 06 | 06 | æÿpEÞ;t.æÿ333       |
| 00009  | 0 1              | E  | 14  | 41   | 00          | 02           | 00   | 20  | 20 | 20  | 00 | 14  | FF  | FF | 00 | FF | FF | Ayy.yy              |
| 0000A  | 0 F              | F  | FF  | 56   | 57          | 5A           | 37   | 5A  | 30 | 43  | 37 | 31  | 35  | 37 | 37 | 38 | 32 | ijijVWZ7Z0C7157782  |
| 0000B  | 0 5              | 6  | 57  | 5A   | 37          | 5A           | 30   | 43  | 37 | 31  | 35 | 37  | 37  | 38 | 32 | 56 | 57 | UW2720C7157782UW    |
| 00000  | 0 5              | A  | 37  | 5A   | 30          | 43           | 37   | 31  | 35 | 37  | 37 | 38  | 32  | DC | 01 | DC | 01 | 2720071577820.0.    |
| 0000D  | 0 D              | C  | 01  | 33   | 56          | 57           | 53   | 45  | 36 | 39  | 4D | 39  | 33  | 4D | 31 | 38 | 39 | U.3UWSE69M93M189    |
| 0000E  | 0 3              | 3  | 34  | 35   | FF          | 58           | 58   | 58  | 58 | 58  | 58 | 58  | 58  | 58 | 58 | 58 | 58 | 345ÿXXXXXXXXXXX     |
| 0000F  | 0 5              | 8  | 58  | 58   | 58          | 58           | 4B   | 97  | 18 | BF  | 4B | 85  | C 4 | 68 | E2 | 68 | E2 | XXXXXKE.;KEAhâhâ 👻  |
|  |                  |    |     |      |             |              |      |     |    |     |    |     |     |    |    |    |    | - Mileage           |
| Model: Golf IV / Bora Model: IMMD3   |                  |    |     |      |             |              |      |     |    |     |    |     |     |    |    |    |    | 121199              |
| Model: Golf IV / Bora Model: IMMU3<br>Part nr.: 1J0 920 906 J ID: VWZ7Z0C7157782 |                  |    |     |      |             |              |      |     |    |     |    |     |     |    |    |    |    |                     |
|  |                  |    |     |      | L           | .ogin:       | 0476 |     |    |     |    |     |     |    |    |    |    | <u>S</u> et Mileage |
|  |                  | _  |     |      |             |              |      |     |    |     |    |     |     |    |    |    |    |                     |

#### figure 1

There is more than one way to capture a PIN. In this example the software found the information we needed via the DLC. This 2003 Jetta, with others were donated for the Advanced Data Blocks class in the Toronto Ontario area. Thank you Sam Nessan at Cross Avenue Auto in Oakville.

As mentioned, there is more than one way to acquire the elusive PIN. We had issues with the 2002 and up A4 Immobilizer and the first groups that caused most of the grief were in College Station, and McAllen, Texas. Pay attention to the next scan.

Scan from McAllen Texas: 2002 A4 ECM and Instrument cluster scan, the customer keys were lost.

#### Address 01: Engine

Part No SW: 8E0 909 559 D HW: 8E0 909 059 Component: 3.0L V6/5V G 0002 Coding: 0016751 Shop #: WSC 63351 1 Fault Found: 17978 - Engine Start Blocked by Immobilizer P1570 - 008 - Implausible Signal **Address 17: Instruments** Part No: 8E0 920 950 H Component: KOMBI+WEGFAHRS. **RB4** D21 Coding: 03200 Shop #: WSC 22129 WAULT68E82AXXXXX AUZ6Z0A0164933 1 Fault Found: 01176 – Key 65-10 - Unauthorized – Intermittent

This is the Bosch cluster and it's indicated by the number RB4. This type of cluster has encryption built in and was difficult to acquire the PIN. We tried various software/hardware combinations similar to the ones tried in College Station Texas with no luck.

Here's the solution for this software level on this cluster on figure 2 and 3.

| F | ile Dasł  | n Imr        | noBox  | ECU | l Air | rbag   | Optio   | n H   | elp  |     |    |    |    |    |    |    |    |   |
|---|-----------|--------------|--------|-----|-------|--------|---------|-------|------|-----|----|----|----|----|----|----|----|---|
| Γ | Offset    | 00           | 01     | 02  | 03    | 04     | 05      | 06    | 07   | 08  | 09 | ØA | ØB | 0C | ØD | ØE | ØF | ASCII                                   |
| L | 00000     | 3 41         | - 55   | 5A  | 36    | 5A     | 30      | 41    | 30   | 31  | 36 | 34 | 39 | 33 | 33 | 11 | 0B | AUZ6Z0A0164933 🚽                        |
| L | 00001     | 3 E 9        | F 0    | 7B  | 54    | A4     | 15      | C 9   | 49   | 77  | E9 | 8E | 4D | FF | FF | FF | FF | éð{T×.ÉIwé∎Mÿÿÿÿ                        |
| L | 00002     | ) FF         | FF     | FF  | FF    | FF     | FF      | FF    | FF   | FF  | FF | FF | FF | FF | FF | FF | FF | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, |
| L | 00003     | 03           | 1D     | 3E  | 97    | 10     | 8 C     | F 3   | A 0  | A 0 | 70 | 1E | 00 | 80 | 0C | 00 | 00 | >∎.∎ó p∎                                |
| L | 00004     | 3 <u>8 8</u> | 00     | 00  | 00    | 00     | 00      | 00    | 00   | 00  | 00 | 00 | 00 | 00 | 00 | 00 | 00 |   |
| L | 00005     | 9 0 0        | 00     | 03  | ØA    | 00     | 00      | 08    | 00   | 00  | 00 | 03 | 03 | 14 | 00 | 00 | 00 |   |
| L | 00006     | 3 74         | 16     | 74  | 16    | 74     | 16      | 74    | 16   | 74  | 16 | 74 | 16 | 74 | 16 | 73 | 16 | t.t.t.t.t.t.t.s.                        |
| L | 00007     | 3 0 C        | 40     | 67  | 01    | 00     | 00      | 00    | 00   | 44  | 00 | 00 | 00 | 00 | 00 | 00 | 00 | .LgD                                    |
| L | 00008     | 9 00         | 00     | 00  | 00    | 00     | 00      | 00    | 00   | 00  | 00 | 00 | 00 | 00 | 00 | 00 | 00 |   |
| L | 00009     | 9 OC         | 00     | 32  | 00    | 00     | 32      | 00    | 00   | 32  | 00 | 00 | 00 | 00 | 00 | 32 | 00 | 222                                     |
| L | 0000A     | 9 00         | 00     | 00  | 00    | 00     | 00      | 00    | 00   | 00  | 00 | 00 | 00 | 00 | 00 | 00 | 00 |   |
| L | 0000B     | 9 00         | 32     | 00  | 00    | 00     | 00      | 00    | 00   | 00  | 00 | 00 | 00 | 00 | 00 | 00 | 00 | .2                                      |
| L | 0000C     | 0 FF         | FF     | FF  | FF    | FF     | FF      | FF    | FF   | FF  | FF | FF | FF | FF | FF | FF | FF | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, |
| L | 0000D     | 0 FF         | FF     | FF  | FF    | FF     | FF      | FF    | FF   | FF  | FF | FF | FF | FF | FF | FF | 00 | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, |
| L | 0000E     | <b>0</b> 7   | 04     | 03  | ØD    | 11     | 00      | 64    | 03   | 1E  | 00 | 80 | 00 | 00 | 00 | 00 | 80 | d                                       |
| L | 0000F     | 9 8 6        | 02     | FF  | FF    | FF     | F 8     | 2 A   | 57   | 41  | 55 | 40 | 54 | 36 | 38 | 45 | 38 | ■.ÿÿÿø*WAULT68E8 -                      |
|   | - Info    |              |        |     |       | Immol  | hilizer |       |      |     |    |    |    |    |    |    |    | - Mileage                               |
|   | Model:    | Audi A       | 4 (8E) |     | 1     | vlodel | : IMM   | 103   |      |     |    |    |    |    |    |    |    | 91980                                   |
|   | Part nr.: | 8E 0 9:      | 20 950 | н   | 11    | D: AU  | 126ZQ   | A0164 | 4933 |     |    |    |    |    |    |    |    |   |
|   |           |              |        |     | l     | _ogin: | 2833    |       |      |     |    |    |    |    |    |    |    | <u>S</u> et Mileage                     |
|   |           |              |        |     |       | _      |         |       | _    |     |    |    |    |    |    |    |    |   |



Sometimes the technician would need to verify the acquired PIN before adapting any key, Instrument cluster or Engine controller. The next figure (3) indicates a match. This match is possible because a bin file was saved. The bin file is the data from this cluster. In figure 2, the hex values are run through a mathematical equation and the output is the data seen at the bottom of figure 2 and figure 3.

| Decode via OBD Decode via File  | Hex editor Picture help   |                |
|---|---|----------------|
| C: [aw_abox1]         C: \         Documents and Settings         Administrator         Desktop         7 to 4 pin         Airbag | <ul> <li>ECU Select you car</li> <li>DASH</li> <li>KEYB Select you car</li> <li>BOX Select you car</li> </ul> | \$<br>\$<br>\$ |
| 600909605A 06 AIRBAG VW5 Clear Dati<br>BE0920950H KOMBI+WEGFAHRS. RB4   | Key1     Store key's       Key2     Info       Key3     Info       Key4     Info                              |                |

#### figure 3

For the sake of speed and simplicity, Vag-Com is used to "adapt" the new components if the correct PIN is known and to display the data in this document. Figure 4 indicates that Immobilizer is ready and that the technician isn't locked out. Any Vag style scan tool like a Vedis or iScan can complete the adaptation.

| VAG-COM: Measuring Blocks / Ba                       | asic Settings     |                          |                   | ×                 |
|--|-------------------|--------------------------|-------------------|-------------------|
| Sample Rate: 1.5  <br>Label File: None               | V.<br>Mea         | AG-COM<br>asuring Blocks | T                 |                   |
| Group<br>022 Up<br>Dn Go!                            | 0                 | 0                        | 0                 | 0                 |
| Group<br>023 Up<br>Dn Go!                            | 0                 | 0                        | 0                 | 6                 |
| Group<br>024 Up<br>Dn Gol                            | 0.0<br>(no units) | 0.0<br>(no units)        | 0.0<br>(no units) | 0.0<br>(no units) |
| Refer to Service Manual!<br>Switch To Basic Settings |                   | Done, Go <u>B</u> ack    | VAG-Sco           | pe Log            |

This instrument cluster in question could not be interrogated in the manner as described in the Jetta. This cluster required removal and attached directly to the scan tool with Immobilizer software. There are three tested and verified methods to acquire the PIN of this model.

- 1. Direct connection to RS232
- 2. Direct connection to the cluster main board
- 3. Direct connection to the IC

These next figures are on an identical cluster that is reconditioned from the Audi parts sources. Methods 1 and 3 were used.

| * 🔁 🛓              |               |                    |
|--------------------|---------------|--------------------|
| Standart Functions | OM Read/Write |                    |
| Part Number:       | Type:         |                    |
| Coding:            | SW:           |                    |
|                    |               | ,                  |
| VIN                | Save          | Read Fault Memory  |
| s/N                | PIN 3596 Open | Clear Fault Memory |
|                    |               | Read Immo          |
|                    |               | Write Immo         |
|                    |               | Add Key            |
|                    |               | Change KM          |

#### method 1

This would involve the cluster to be removed and connected to the RS232 line for encrypted communications. This PIN is now acquired as 3596. This cluster is described as reconditioned. That is because the last digit in the part number indicates an "X".

The first cluster indicated 8E0 920 950 H

The second cluster indicates 8E0 920 950 HX

Remember, the PIN will be exposed as a 4 digit PIN but it is input as a 5 digit PIN

See the next Instrument cluster scan.

| IC=1 TE=0 RE<br>Protocol: KW12   | =0 <b>VAC</b><br>81   Open       | S-COIVI<br>Controller |                           |                              |  |  |  |  |  |  |  |  |  |
|----------------------------------|----------------------------------|-----------------------|---------------------------|------------------------------|--|--|--|--|--|--|--|--|--|
| -Controller Info-<br>VAG Number: | 8E0 920 950 HX                   | _<br>Component:       | KOMBI+WE                  | GFAHRS. RB4 D27              |  |  |  |  |  |  |  |  |  |
| Soft. Coding:                    | 03201                            | <br>Shop #            | WSC 02132                 |                              |  |  |  |  |  |  |  |  |  |
| Extra:                           | WAULT68E22A131092 AUZ6Z0A0255971 |                       |                           |                              |  |  |  |  |  |  |  |  |  |
| Extra:                           |                                  |                       |                           |                              |  |  |  |  |  |  |  |  |  |
| Basic Function                   | s<br>These are "Safe"            | Advanced              | Functions —<br>Refer to S | ervice Manual !              |  |  |  |  |  |  |  |  |  |
| <u>F</u> ault Code               | s - 02 <u>R</u> eadiness - 15    | Lo                    | gin - 11                  | Re <u>c</u> ode - 07         |  |  |  |  |  |  |  |  |  |
| <u>M</u> eas. Block              | <b>(s - 08</b> Advanced [D - 1A  | <u>B</u> asic S       | Settings - 04             | Adaptation - 10              |  |  |  |  |  |  |  |  |  |
|                                  | ng - 09 Euture Evn               | Output                | t Tests - 03              | <u>S</u> ecurity Access - 16 |  |  |  |  |  |  |  |  |  |

This is where the scans become important. It is the version and software level that will indicate if the cluster will produce the PIN at the repair facility as a field repair or if it needs to be sent to ESAT Inc to acquire the encrypted PIN for the facility.

Either way, the PIN can be found and have the keys or new ECM adapted to the this A4 with ease and does not require dealer intervention. The repair facility can do this in house, in most cases on any VW or Audi.

The rules change when a used ECM needs to be adapted to the original cluster. More on that later.

The next illustration is the encrypted data for the same cluster.

| ₹¥    | e E      | 2     | 6        | 6    | 9     |      | à    | Ģ   | 600 | Ş   | 0000 |     |     |     |     |            |     |                                 |     |
|-------|----------|-------|----------|------|-------|------|------|-----|-----|-----|------|-----|-----|-----|-----|------------|-----|---------------------------------|-----|
| Stand | art Func | tions | EE       | PRO  | 4 Rea | ad/W | rite |     |     |     |      |     |     |     |     |            |     |                                 |     |
|       |          | 00    | 01       | 02   | 03    | 04   | 05   | 06  | 07  | 08  | 09   | 0 A | 0B  | 0C  | 0D  | 0E         | 0F  | 0123456789ABCDEF                | 1   |
|       | 0×000    | 9D    | 8E       | 92   | C9    | EB   | 96   | 16  | 51  | 9E  | D3   | 21  | D3  | 92  | C5  | 88         | D4  | Q!                              | 1   |
|       | 0x010    | 00    | 9E       | 16   | 01    | 00   | 00   | 00  | 00  | 00  | 00   | 00  | 00  | 00  | 00  | 00         | 00  |                                 | 1   |
|       | 0x020    | C4    | 5E       | BE   | 98    | 45   | 36   | 54  | CE  | 5F  | 41   | ЗC  | 8B  | 05  | F5  | 50         | F6  | . ^ E6TA< P.                    |     |
|       | 0x030    | 9B    | 45       | 2F   | AA    | 81   | 59   | D5  | 81  | BF  | E 1  | 43  | 59  | 60  | 86  | BE         | C4  | . E/ Y CY`                      | H   |
|       | 0x040    | 03    | 78       | 84   | 76    | FE   | D4   | 77  | AE  | 87  | 31   | 66  | 70  | CC  | SC  | 38         | E8  | .x.vw1fp.\8.                    |     |
|       | 0×050    | 41    | 55       | 5 A  | 36    | 5 A  | 30   | 41  | 30  | 32  | 35   | 35  | 39  | 37  | 31  | 70         | 00  | AUZ6Z0A0255971p.                |     |
|       | 0×060    | 81    | 0 C      | 00   | 00    | 00   | 00   | 00  | 00  | 00  | 00   | 00  | 00  | 00  | 00  | 00         | 00  |                                 |     |
|       | 0×070    | 01    | 00       | 03   | 00    | 00   | 00   | 00  | 00  | 00  | 14   | 00  | 00  | 00  | 00  | 00         | 00  | · · · · · · · · · ¶ · · · · · · |     |
|       | 0×080    | 00    | 00       | 00   | 00    | 00   | 00   | 00  | 00  | 00  | 00   | 00  | 00  | 00  | 00  | 00         | 00  |                                 |     |
|       | 0×090    | 00    | 00       | 00   | 00    | 00   | 00   | 00  | 00  | 32  | 00   | 00  | 00  | 00  | 00  | 00         | 00  |                                 |     |
|       | 0×0A0    | 00    | 00       | 32   | 00    | 00   | 00   | 00  | 00  | 00  | 00   | 00  | 00  | 00  | 00  | 00         | 00  | 2                               |     |
|       | 0×080    | 00    | 32       | 00   | 00    | 00   | 00   | 00  | 00  | 00  | 00   | 00  | 00  | 00  | 00  | 00         | 00  | . 2                             |     |
|       | 0x0C0    | 01    | FF       | FF   | FF    | 02   | 08   | 54  | FF  | FF  | FF   | FF  | FF  | FF  | FF  | FF         | FF  | · · · · · · T · · · · · · · ·   |     |
|       | 0x0D0    | FF    | FF       | FF   | FF    | FF   | FF   | FF  | FF  | FF  | FF   | FF  | FF  | FF  | FF  | FF         | 00  |                                 |     |
|       | 0x0E0    | 07    | 04       | 03   | OD    | 11   | 00   | 64  | 03  | 1 E | 00   | 80  | 00  | 00  | 00  | 00         | 80  | d                               |     |
|       | UXUFU    | 80    | 02       | FF   | FF    | FF   | 19   | 79  | 57  | 41  | 55   | 4 C | 54  | 36  | 38  | 45         | 32  |                                 |     |
|       | 0×100    | 03    | DI       | 90   | 32    | 20   | 05   | 40  | 94  | CE  | AA   | AB  | E4  | 78  | C4  | 99         | 14  | ····2,·L·····{··1               |     |
|       | 0x110    | 19    | UZ<br>DE | DB   | 48    | 00   | AB   | AC  | 30  | EI  | 09   | 24  | 94  | 52  | 75  | <b>F</b> 5 | 31  | H=\$.R~.1                       |     |
|       | 0×120    | 4.1   | DF<br>EE | DE D | 24    | E A  | 20   | 40  | 20  | 20  | 26   | 25  | 20  | 20  | 21  | 20         | 01  | AU7670A02550715                 |     |
|       | 0×130    | 01    | 35       | 00   | 30    | 00   | 30   | 0.0 | 30  | 00  | 35   | 00  | 00  | 37  | 00  | 00         | 00  | AU2020AU2559/10.                |     |
|       | 0×140    | 22    | 41       | 21   | 22    | 21   | 20   | 20  | 22  | 57  | 41   | 55  | 40  | 54  | 26  | 20         | 45  | 20121002WAULT69E                |     |
|       | 0×160    | 32    | 32       | 41   | 31    | 33   | 31   | 30  | 30  | 32  | 00   | 0.0 | 00  | 00  | 60  | 01         | 0.1 | 220131092 m                     |     |
|       | 0×100    | 34    | 00       | 0.8  | 00    | 28   | 00   | 00  | 00  | 10  | 10   | 34  | 38  | 38  | 0.0 | 0.4        | 00  | . (                             |     |
|       | 0×180    | 44    | 98       | EE.  | EE.   | 14   | 38   | 0.0 | 0.0 | 00  | 00   | 32  | 46  | 50  | 73  | 78         | 82  | 1¶                              |     |
|       | 0x190    | 00    | 16       | 20   | 20    | 46   | 54   | 74  | 73  | 78  | 73   | 05  | 00  | 00  | 52  | 42         | 34  | E725X5 RB4                      |     |
|       | 0x1A0    | 44    | 32       | 37   | 93    | 63   | 0F   | 1.E | 00  | 00  | 00   | 00  | 00  | 00  | 9B  | FF         | FF  | D27.cx                          |     |
|       | 0×1B0    | зċ    | 04       | 80   | 9A    | 0F   | FF   | 06  | FF  | 04  | 0F   | FF  | 1 F | FF  | 30  | 30         | 87  | <××00.                          |     |
|       | 0x1C0    | 00    | 02       | 55   | FF    | FF   | FF   | 10  | 10  | FF  | FF   | FF  | FF  | 00  | FF  | 00         | 1 A | U                               |     |
|       | 0×1D0    | 00    | 07       | 2E   | FF    | FF   | FF   | 10  | 10  | FF  | FF   | FF  | FF  | 00  | FF  | 00         | FF  |                                 |     |
|       | 0×1E0    | 00    | 0F       | 28   | FF    | FF   | FF   | 08  | 08  | 32  | FF   | FF  | FF  | D8  | 50  | зc         | 14  | .×(2P<¶                         |     |
|       | 0×1F0    | F6    | 19       | 64   | 00    | 28   | 55   | 64  | 46  | 10  | 12   | 17  | ЗВ  | D8  | ЕC  | 00         | 50  | d.(UdF;P                        |     |
|       | 0x200    | E3    | 39       | C5   | 11    | 10   | 72   | EA  | 13  | 76  | 59   | 10  | 09  | FC  | 0F  | 26         | B2  | . 9 r v Y ×&.                   |     |
|       | 0x210    | 50    | 06       | 24   | A1    | Ε8   | ЗE   | 48  | BC  | 0 A | 23   | 07  | Ε3  | DA  | 9E  | 34         | F2  | P.\$>H#4.                       |     |
|       | 0x220    | 03    | 03       | 4 B  | D7    | FF   | D0   | A1  | 79  | Ε6  | 60   | 78  | 54  | 71  | 88  | BB         | 18  | Ky.`xTq                         |     |
|       | 0x230    | 41    | 55       | 5 A  | 36    | 5 A  | 30   | 41  | 30  | 32  | 35   | 35  | 39  | 37  | 31  | 70         | 00  | AUZ6Z0A0255971p.                |     |
|       | 0×240    | 81    | 0 C      | 00   | 00    | 0.0  | 00   | 00  | 00  | 00  | 00   | 00  | 00  | 00  | 00  | 00         | 00  |                                 |     |
|       | 0×250    | 20    | 00       | 00   | 02    | 20   | CC   | 06  | 00  | 80  | Ε2   | 41  | F0  | 39  | FC  | EA         | 06  | A.9                             |     |
|       | 0x260    | B4    | 10       | DA   | 19    | 88   | 22   | DD  | 2 A | ED  | 32   | CB  | ЗA  | 8C  | 42  | A8         | 2F  | ".*.2.:.B./                     |     |
| L     | 0,270    | OF.   | 22       | 0.0  | 0.2   | 0.0  | 0.0  | 26  | 2.0 | 1.5 | 2.2  | 0.4 | 22  | 1.5 | 1   | 0.0        | 0.0 | # 0. 7 #                        | 200 |

Now imagine taking the data out of one defective cluster and rewriting the data into the USED cluster for any VW or Audi. No adaptation required. That's where ESAT Inc and the supporting repair facilities are headed.

## Use the KISS factor (Keep It Simple Stupid)

### and "Think outside the box"

Thank you to Bill Marden at Autoworks in College Station, Texas with Umberto Zingg at German Cars Auto Shop in McAllen, Texas for providing the donors and ongoing research.

Thank you to Steve Bartock in California for providing data proving "just because it says so, doesn't make it so".

# **ECM** Adaptation

New ECM's can be adapted with relative ease if the PIN is known. Depending on the systems used, most PINs can be acquired and the new ECM can be installed, adapted and the readiness set as the final check.

The problem is the used ECMs. In order to adapt the used ECM, the original pin from the Immobilizer must be known. We know that and it's been solved. The problem lies with the used ECM. Data from another vehicle has been written to the IC. One way or another, that data must be accessed and the PIN acquired.

The ESAT Inc solution is a direct connection to the ECM and viewing the HEX data. In most cases, the PIN is found. Once both PINs are known, adaptation can take place easily.

The next step is to rewrite the data into the replacement ECM directly from the original ECM. Once again.

### Use the KISS factor (Keep It Simple Stupid)

### and "Think outside the box"

I have a Jetta TDi ECM and it only took 4 screws to open it. See this next figure.



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Notice the wires, that's because there is no RS232 communication. It is ALL ON CAN. The next illustration is of the data from this ECM.

| × (   | 2   | 6   | F     | 9  |    | and . | C. | POUP | E Aller | 20000 | Å     | 00000 | 2   | K ↔ J | (   |     |                                       |
|-------|-----|-----|-------|----|----|-------|----|------|---------|-------|-------|-------|-----|-------|-----|-----|---------------------------------------|
|       | 00  | 01  | 02    | 03 | 04 | 05    | 06 | 07   | 08      | 09    | 0 A   | OВ    | 0 C | 0D    | 0E  | 0F  | 0123456789ABCDEF                      |
| 0x000 | 01  | 46  | 4 C   | 48 | AA | FF    | FF | 32   | 38      | 34    | 2E    | 30    | 33  | FF    | FF  | FF  | ĴFLH284.03                            |
| 0×010 | FF  | FF  | 32    | 38 | 34 | 2E    | 30 | 33   | A2      | Β7    | FF    | FF    | FF  | FF    | FF  | FF  |                                       |
| 0×020 | FF  | FF  | FF    | FF | FF | FF    | FF | FF   | FF      | FF    | FF    | FF    | FF  | FF    | FF  | FF  |                                       |
| 0×030 | FF  | FF  | 2F    | 2F | FF | ЗF    | FC | 57   | FF      | FF    | FF    | FF    | DO  | 1 F   | A2  | Β7  | //.?.W                                |
| 0×040 | 02  | 00  | A2    | Β7 | 00 | 00    | 00 | 00   | 00      | 00    | 00    | 00    | 00  | 00    | 8 A | 00  |                                       |
| 0×050 | 02  | 00  | A2    | B7 | 00 | 04    | 00 | 42   | 00      | 00    | 42    | 00    | 84  | 87    | 84  | 85  | BB                                    |
| 0×060 | 02  | 00  | 00    | 00 | BE | BF    | BC | 83   | 00      | 83    | 00    | 00    | 00  | 00    | 84  | 85  |                                       |
| 0x070 | 00  | 00  | 88    | UB | 96 | 07    | E3 | CE   | 01      | 00    | FF OO | 00    | 00  | UE    | 92  | 18  |                                       |
| 0×080 | 00  | 00  | 00    | 00 | 00 | 00    | 00 | 00   | 00      | 00    | 00    | 00    | 00  | 00    | 00  | 00  |                                       |
| 0×090 | 00  | 00  | 50    |    | 50 |       | 55 |      | 50      |       | 50    | 30    | - C | 57    | 00  | 00  | · · · · · · · · · · · · · · · · · · · |
| 0x0A0 | 00  | 00  | 00    | 00 | 00 | 00    | 00 | 00   | 00      | 00    | 00    | 00    | 00  | 00    | 00  | 00  |                                       |
| 0,000 | 00  | 00  | 00    | 00 | 00 | 00    | 00 | 1.0  | 00      | 00    | EE    | CE    | 0.3 | 20    | 40  | 00  | M                                     |
| 0×000 | 10  | 00  | 04    | 28 | 02 | 61    | 60 | EC   | 47      | 6B    | 23    | 45    | 88  | 04    | 00  | 04  | ( a` k#F                              |
| 0×0E0 | 28  | 01  | 00    | 00 | 00 | E3    | 90 | 49   | 45      | 20    | 20    | 00    | 04  | 28    | 01  | 00  | (                                     |
| 0×0E0 | ED. | 00  | ED    | 71 | 45 | 45    | 02 | 02   | 00      | 0.4   | 28    | 01    | 00  | 90    | 60  | ED. | σΕΕ(m.                                |
| 0×100 | ED  | 34  | 45    | 02 | 02 | 00    | 14 | 28   | 01      | 00    | 00    | 90    | 6D  | A4    | 49  | 20  | . 4E ¶(m. I                           |
| 0×110 | 7E  | FD  | A4    | 00 | 00 | 80    | FD | 00   | 00      | 00    | 00    | 00    | 00  | 00    | 00  | 00  | E                                     |
| 0×120 | 00  | 00  | 00    | 00 | FF | 80    | 18 | 74   | 48      | A8    | C2    | 90    | F6  | 82    | 63  | 0D  | tHc.                                  |
| 0×130 | 38  | 56  | 57    | 5A | 37 | 5A    | 30 | 42   | 34      | 39    | 35    | 33    | 37  | 35    | 31  | C6  | ;VWZ7Z0B4953751.                      |
| 0×140 | 33  | 56  | 57    | 53 | 50 | 32    | 39 | 4D   | 31      | 32    | 4 D   | 31    | 37  | 39    | 34  | 39  | 3VW5P29M12M17949                      |
| 0×150 | 31  | 94  | 00    | 00 | 10 | B5    | FF | 80   | 18      | 74    | 48    | A8    | C2  | 90    | F6  | 82  | 1tH                                   |
| 0×160 | 63  | 0 D | ЗВ    | 56 | 57 | 5A    | 37 | 5 A  | 30      | 42    | 34    | 39    | 35  | 33    | 37  | 35  | c.;VWZ7Z0B495375                      |
| 0×170 | 31  | C6  | 33    | 56 | 57 | 53    | 50 | 32   | 39      | 4 D   | 31    | 32    | 4 D | 31    | 37  | 39  | 1.3VW5P29M12M179                      |
| 0×180 | 34  | 39  | 31    | 94 | 00 | 00    | 10 | B5   | 18      | 74    | 48    | A8    | C2  | 90    | F6  | 82  | 491tH                                 |
| 0×190 | 01  | 00  | 00    | 00 | 03 | 58    | 00 | 00   | 00      | 00    | 00    | 05    | 2D  | 92    | 1 A | 00  | X                                     |
| 0×1A0 | 17  | 00  | 0 A 0 | 00 | 00 | 00    | 00 | 00   | 00      | 00    | 6E    | D3    | 04  | 00    | 2B  | 11  | n+.                                   |
| 0×1B0 | 73  | 00  | 71    | 00 | 92 | 1 A   | 00 | 00   | 00      | 00    | BB    | 04    | 00  | 00    | 00  | 7F  | s.q                                   |
| 0×1C0 | FC  | 85  | 00    | 00 | 00 | FD    | 18 | 15   | 00      | 00    | 2D    | 92    | 1 A | 00    | 17  | 00  | ····§··-                              |
| 0×1D0 | OA. | 00  | 00    | 00 | 00 | 00    | 00 | 00   | 3F      | CF    | 04    | 00    | 28  | 11    | 73  | 00  | ·····?···+·s·                         |
| UX1EU | 11  | 00  | 92    | 14 | 00 | 00    | 00 | 00   | BB      | 04    | 00    | 00    | 00  | 15    | FC  | 85  | qL.                                   |
| UX1FU | 00  | 00  | 00    | FD | 18 | 15    | 00 | 00   | 00      | 00    | 55    | 1 A   | 18  | 1 A   | 84  | 00  | §U                                    |
|       |     |     |       |    |    |       |    |      |         |       |       |       |     |       |     |     |                                       |
|       |     |     |       |    |    |       |    |      |         |       |       |       |     |       |     |     |                                       |
|       |     |     |       |    |    |       |    |      |         |       |       |       |     |       |     |     |                                       |
|       |     |     |       |    |    |       |    |      |         |       |       |       |     |       |     |     |                                       |
|       |     |     |       |    |    |       |    |      |         |       |       |       |     |       |     |     |                                       |
|       |     |     |       |    |    |       |    |      |         |       |       |       |     |       |     |     |                                       |
|       |     |     |       |    |    |       |    |      |         |       |       |       |     |       |     |     |                                       |
|       |     |     |       |    |    |       |    |      |         |       |       |       |     |       |     |     |                                       |

In some very special circumstances the Immobilizer can be turned OFF for test purposes. We've tried it and it works for these EDC15 and EDC16 ECMs.

The next illustration indicates the PIN for this TDi ECM. Now that we know that, we were able to adapt a used 2002 A4 Bosch RB4 instrument cluster to a 2002 Jetta TDi used ECM. All that was required is recoding of the cluster to indicate the correct transmission. There's always someone saying it can't be done. I had to prove otherwise.

| Decode via OBD Decode via File  | Hex editor Picture help   |  |
|---|---|--|
| Image: c: [aw_abox1]         Image: C: \         Image: Desktop         Ima | <ul> <li>ECU</li> <li>DASH Select you car</li> <li>KEYB Select you car</li> <li>BOX Select you car</li> </ul> |  |
| 6Q0909605A 06 AIRBAG VW5 Clear Dati<br>8E0920950H KOMBI+WEGFAHRS. RB4 I<br>Immo VIN 495375.bin  | Key1     Store key's       Key2     Info       Key3     Info       Key4     Info                              |  |

Euro Systems Automotive Training offers this service including advanced training to its partners in Canada and the US.

- 1. Direct hardware and software lending service for PIN acquisition
- 2. ESAT Inc will "walk" you through the process
- 3. On site PIN acquisition for the encrypted models
- 4. Immobilizer with VW and Audi technical support

We are very close to completing our own version of PIN acquisition tools far beyond the so called "pass through" technology. The plan is to marry more than one piece of software to one tool. We're just about there. When completed, the field technician will be able to acquire the needed data on site and with our help, get the job done and didn't need to visit the dealer.

This is not some HACK job. This requires detailed training, patience with record keeping. Partners must keep detailed records in order to rely on various Immobilizer system adaptations and PIN code reading because of their differences and behaviors.

NOTE: The only facilities that can partner with ESAT Inc. will be the ones that sign a non disclosure form.

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