

ABY / ADU Engine Wiring

A demystifying guide to schematics & cabling

Rev02 - Paul Nugent, 3rd August 2009



Introduction

- The purpose of this document is to itemise and describe the ABY / ADU engine wiring loom
- Refer to my 'Schematics & Wiring Primer' in the first instance for any background information
- This document identifies all of the locations used to correctly integrate the ABY/ADU wiring into an Audi B3/B4 vehicle (or adapt to other vehicles)
- This information is as correct as I can make it but the reader is well advised to double check that everything is to their own satisfaction at installation.

For all S2/RS2 schematics across the years and B3/B4 variants →
http://www.s2central.net/S2_Schematics/

ABY/ADU looms over the years

LHD

ABY	Notes	Part Number
1992-1994	-	8A1 971 072 BM
1992-1994	With anti-theft & IMMO-A	8A1 971 072 GL
1995 >>	With IMMO-1	8A1 971 072 JB

RHD

ABY	Notes	Part Number
1992-1994	-	8A2 971 072 AG
1992-1994	With anti-theft & IMMO-A	8A2 971 072 DA
1995 >>	With IMMO-1	8A2 971 072 EH *

* Used in this document

ADU	Notes	Part Number
1994	With anti-theft & IMMO-A	8A1 971 072 GT
1995,1996	With IMMO-1	8A1 971 072 JF

ADU	Notes	Part Number
1994-1996	With IMMO-1 ?	8A2 971 072 EN

NOTE -

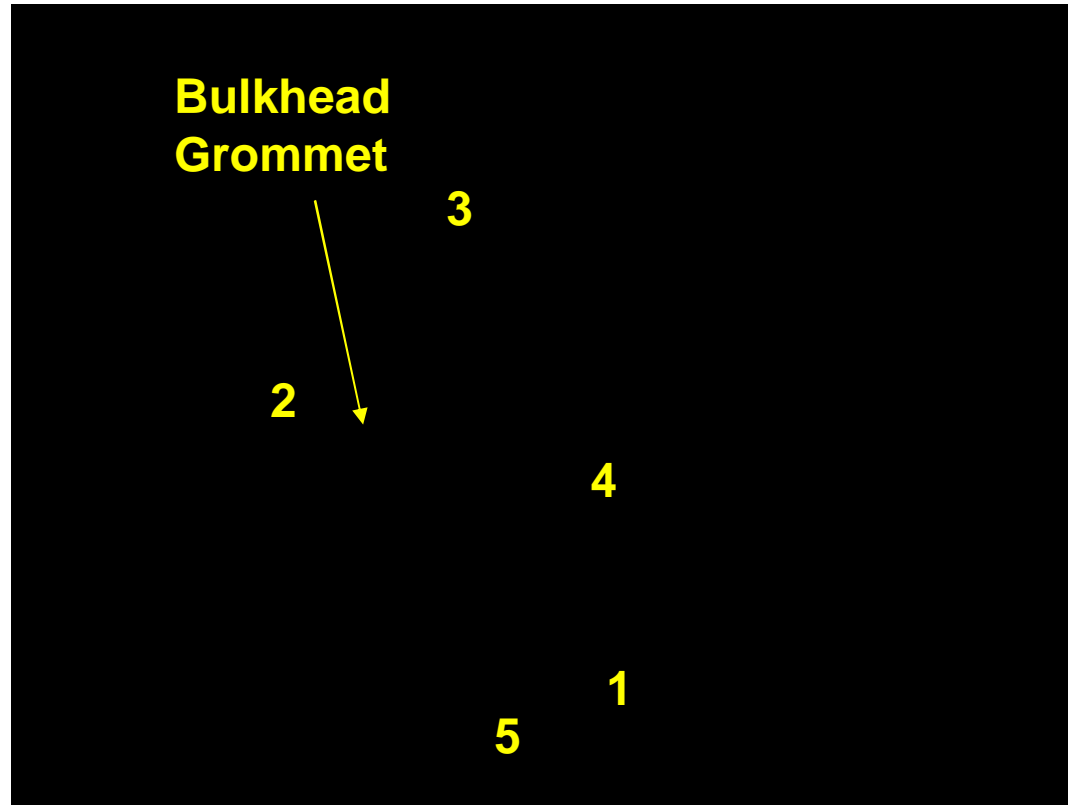
IMMO-1 uses key transponders and ECU comms
IMMO-A predates that with an alternative system

The ABY Wiring Loom (Late RHD shown)



Main ABY Wiring Loom

Note – This loom is RHD MY95



Consider the loom to be composed of five sections :

Bundle 1 - To the ECU - wrapped in yellow tape

Bundle 2 - The heavy insulated section into the engine bay

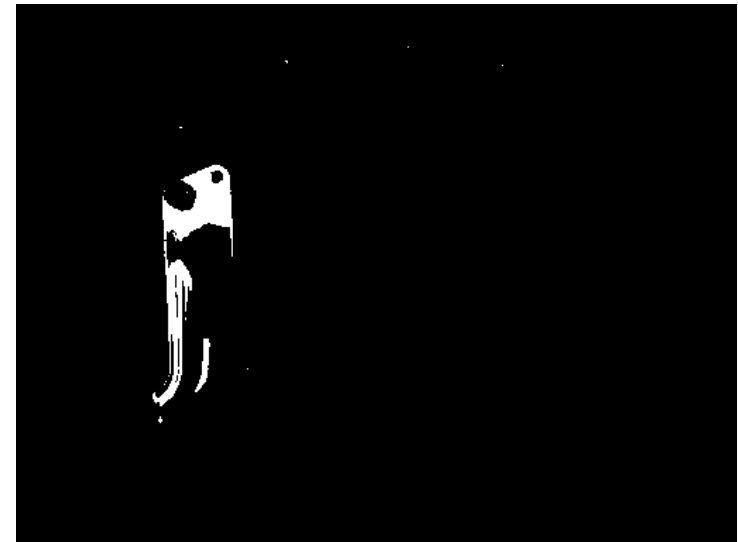
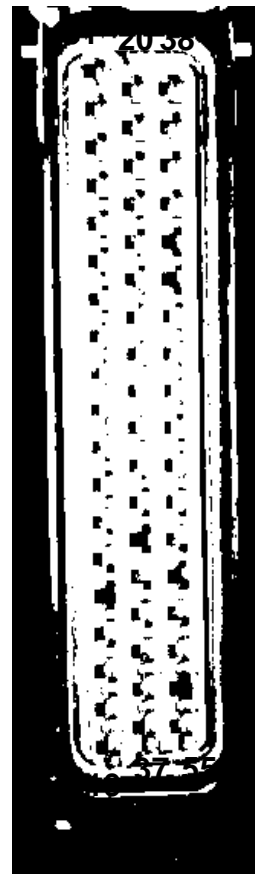
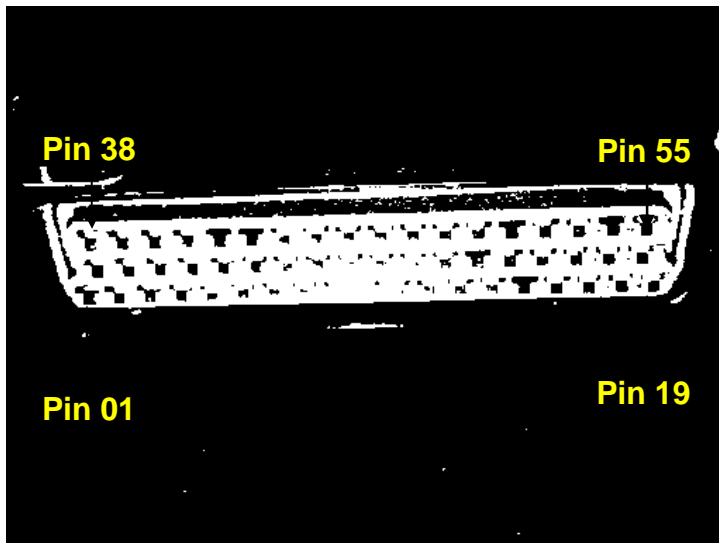
Bundle 3 - A very skinny bundle that connects to a single 2-pin plug

Bundle 4 - Another skinny bundle, yellow wrapped, with two connectors at the end

Bundle 5 - Big yellow bundle to the fusebox & relay blocks with a mass of spaghetti at the end

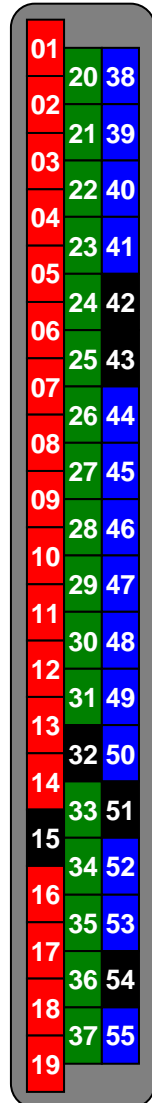
Bundle 1 – ECU (J220)

- Bundle 1 connects directly to ECU by way of huge 55-pin Bosch Motronic connector



ECU Pin Out

JPT-55



Pin	Colour	To
01	gn/ws	N122 / 4
02	li	N122 / 3
03	br/gn	J17 / 47
04	gn/sw	N71 / 2
05	ws	N80 / 2
06	gn/sw	HVAC I/O
07	sw/ws	G70 / 3
08	gn	G40 / 2
09	gr	F96 / 1
10	br/ge	0V
11	ws	G61 / 1
12	ro/sw	+5V
13	gn/gr ws/ro	OBD-L
14	br/ro	0V
15	-	-
16	br/ro	INJ #5
17	br/bl	INJ #2
18	ro/ws	+12V (S27)
19	br/ge	0V

Pin	Colour	To
20	ro/sw	N127 / 4
21	gn	N127 / 3
22	gr/br	MIL
23	sw/bl	N122 / 1
24	br/ro	0V
25	bl/li	G70 / 4
26	ws/gn	G70 / 2
27	sw	+12V (S32)
28	gn	G39 / T1a
29	gn	G66 / 1
30	sw/li	0V ref
31	br/sw bl bl/sw	OBC
32	-	-
33	gn/ge	N75 / 2
34	br/gn	INJ #3
35	br/ws	INJ #4
36	br/sw	INJ #1
37	bl/sw	J17 / 59 (S28)

Pin	Colour	To
38	br/bl	Code Plug
39	ws/sw	Code Plug
40	li	RPM
41	sw/ge	J155 / 3
42	-	-
43	-	-
44	sw/ge	G42
45	ro/gn	G62
46	bl/ws	F76 / R
47	ro	G4 / 2
48	li + gr	0V ref
49	bl	G28 / 2
50	ws/bl	VSS
51	-	-
52	gn/li	F60 / 6
53	gn/bl	G69 / 3
54	-	-
55	gn/ro gn	OBD-K



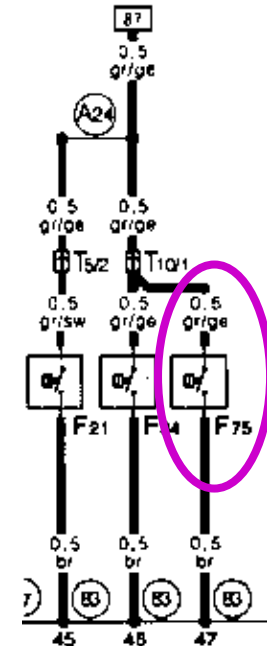
Bundle 2 – Engine Room

- Let's break this one down into smaller cable bundles, starting from the bulkhead grommet :
 - 2.1 Two circular multi-pin plugs and one 2-pin plug
 - 2.2 Hefty mass of multi-pin plugs
 - 2.3 Plugs for lambda probe
 - 2.4 Two spades and a 2-pin plug
 - 2.5 A 6-pin plug on its own
 - 2.6 A grey circular plug with 2 pins
 - 2.7 A red/black wire with single spade
 - 2.8 A black wire with hooded eyelet connector

Bundle 2.1 – Engine Loom

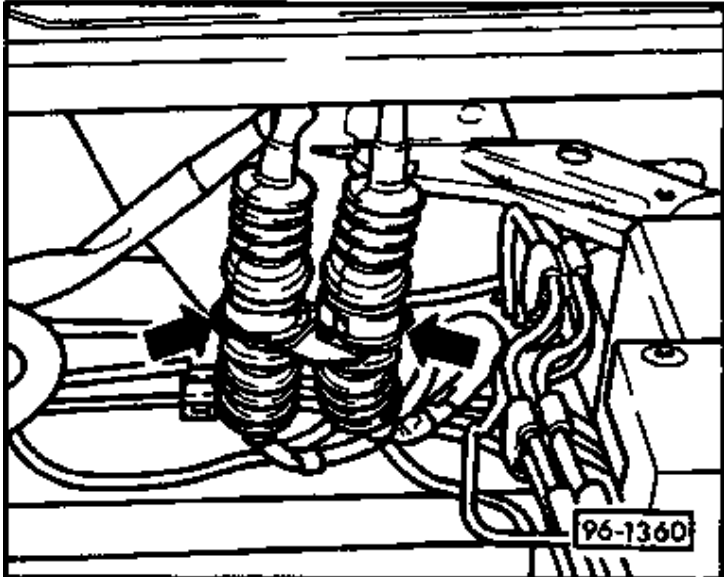


TIP - Test connectivity
from **F75** to **T10/1** and **0V**
See Bundle 5.

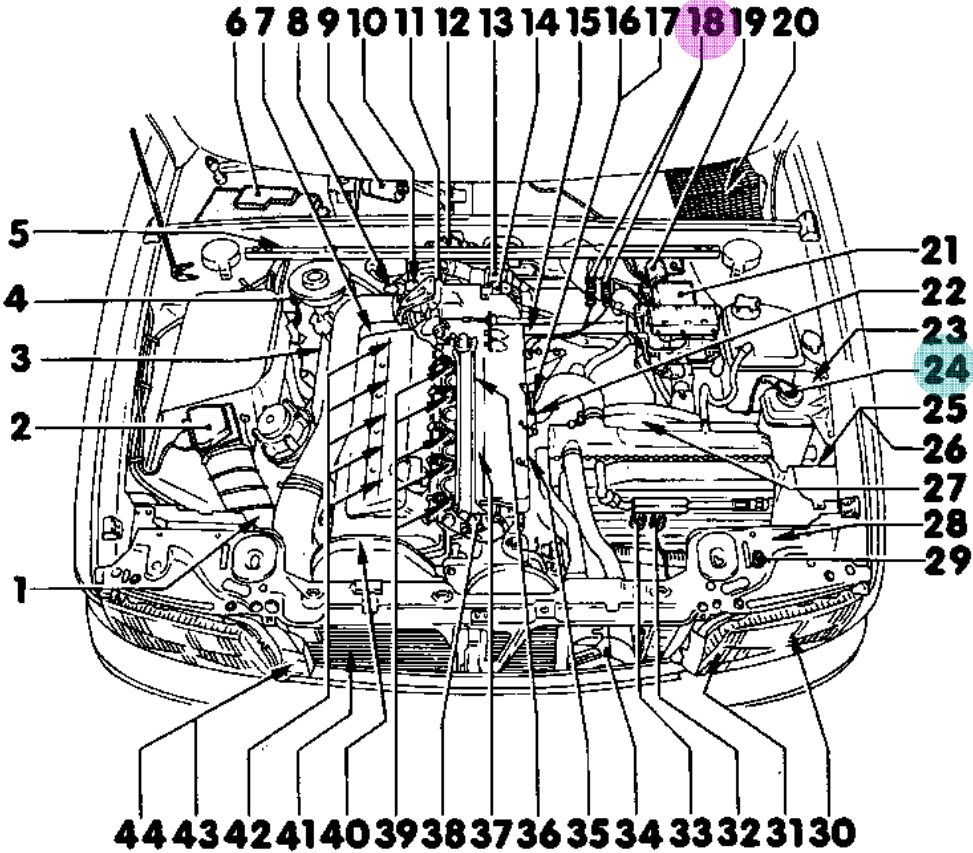


- **F75** – 2 pin connector for hydraulic oil level switch
- **T8f** is marked with a '1' label – this side is male
- **T8e** is marked with a '2' label – this side is male

Locations : T8e, T8f & F75

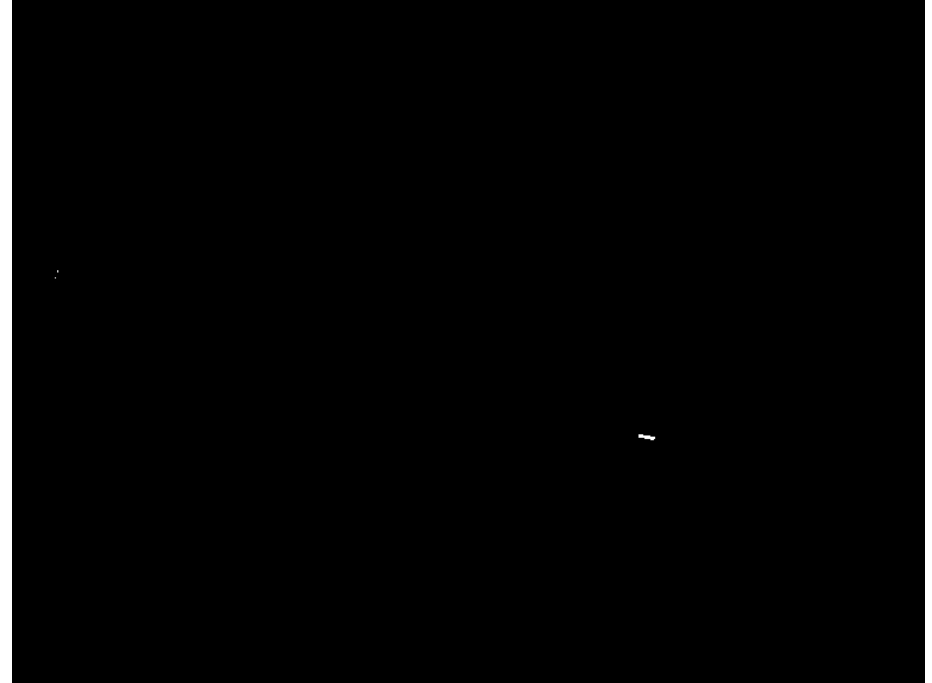


T8e & T8f
Bulkhead – Location 18



F75 on Hydraulic Reservoir
Location 24

Bundle 2.2 – So many connectors !



- **Bundle 2.2.A**

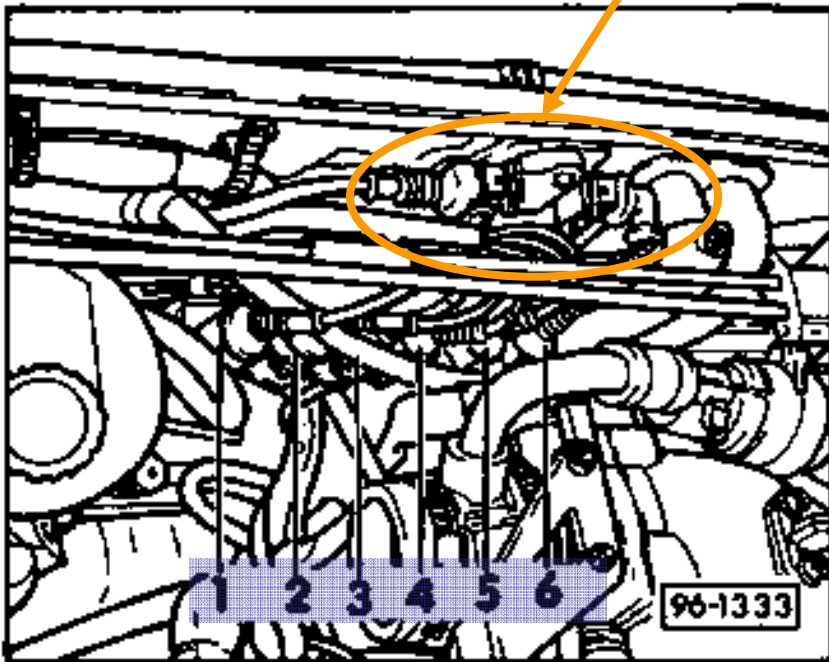
- Total of 9 multi-pin plugs here
- 6 of them extend to various sensors by way of the bulkhead connector panel (BCP) shown on next page

- **Bundle 2.2.B**

- A fatter branch carries these to fuel injectors, inlet manifold and head

Bulkhead Connector Panel (BCP)

2 x Power Output Stages (POS) – **N122 & N127**

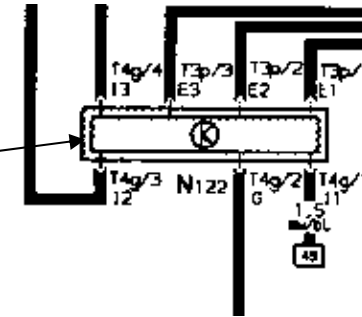
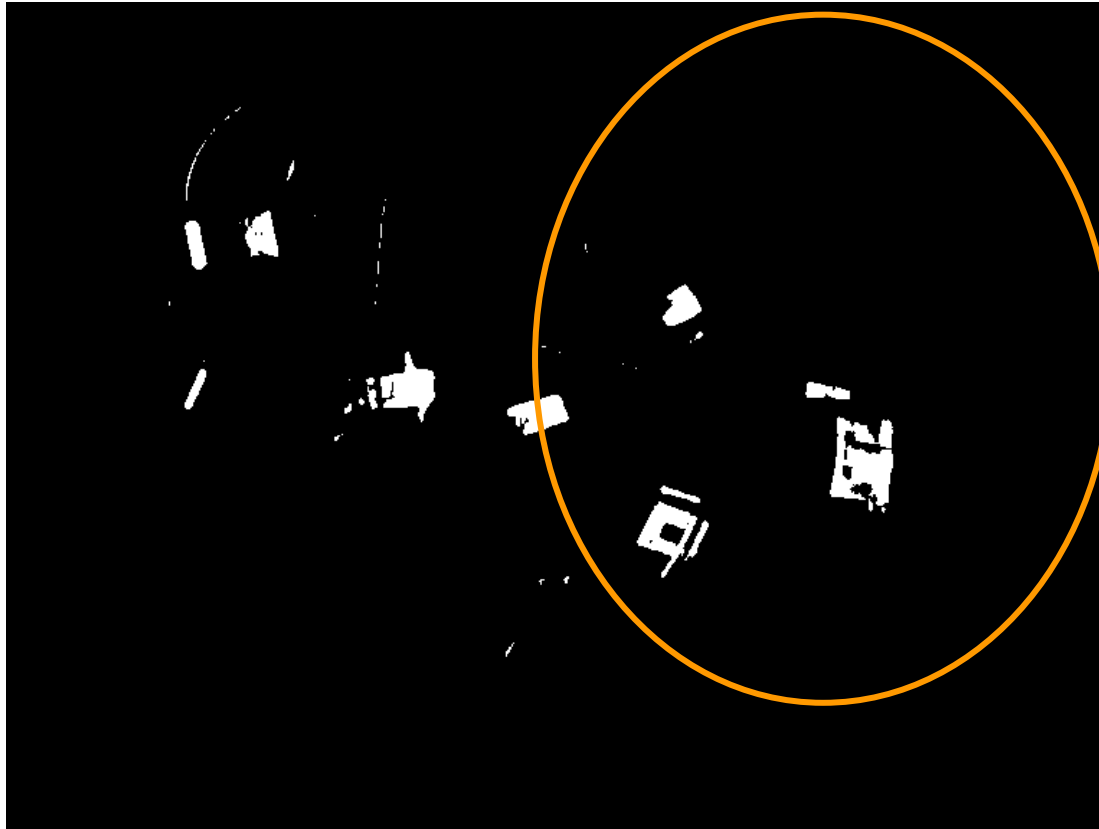


Location – Rear of cylinder head

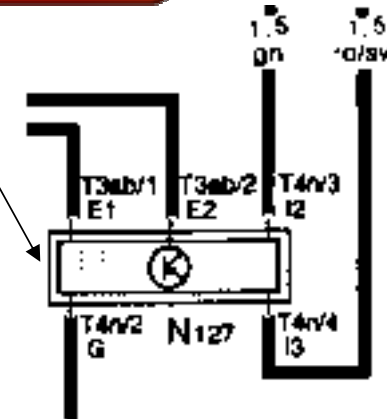
1. White, Coils 4 & 5 (**T3aa**)
2. White, Coils 1-2-3 (**T3k**)
3. Green: Knock-1 (**G61**)
4. Blue: Knock-2 (**G66**)
5. Grey: Crank Speed (**G28**)
6. Black: Crank Position (**G4**)

Note – Other colours of knock sensor exist.

Bundle 2.2.A.1 – POS & Coils

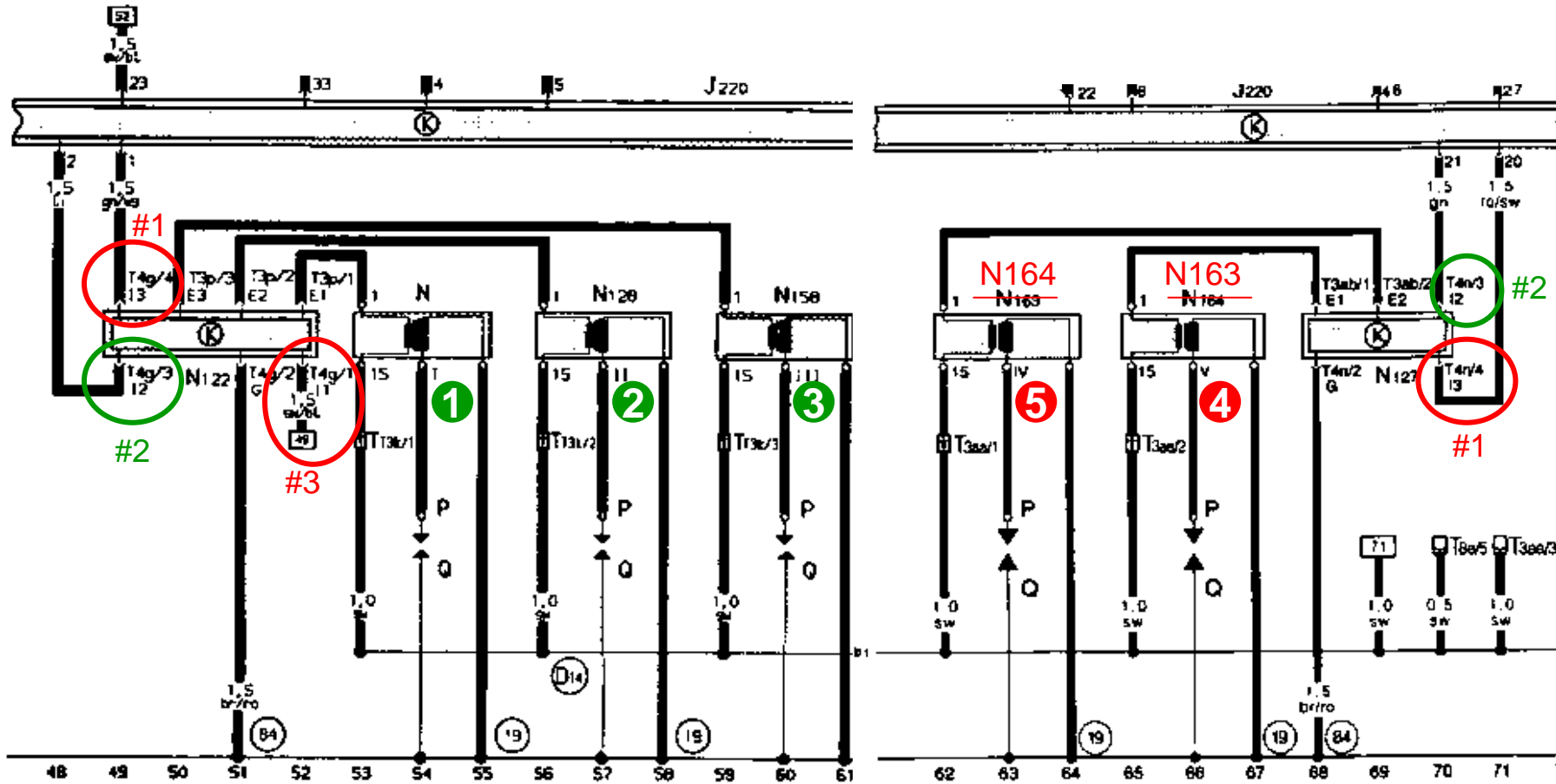


**Warning -
Schematic Errors
Ahead**



- **T4g** – Brown, Input to POS for cyls 1-2-3 (**N122**)
- **T4n** – Black, Input to POS for cyls 4 & 5 (**N127**)
- **T3k** and **T3aa** – White, +12V supply to coils, fused by S32

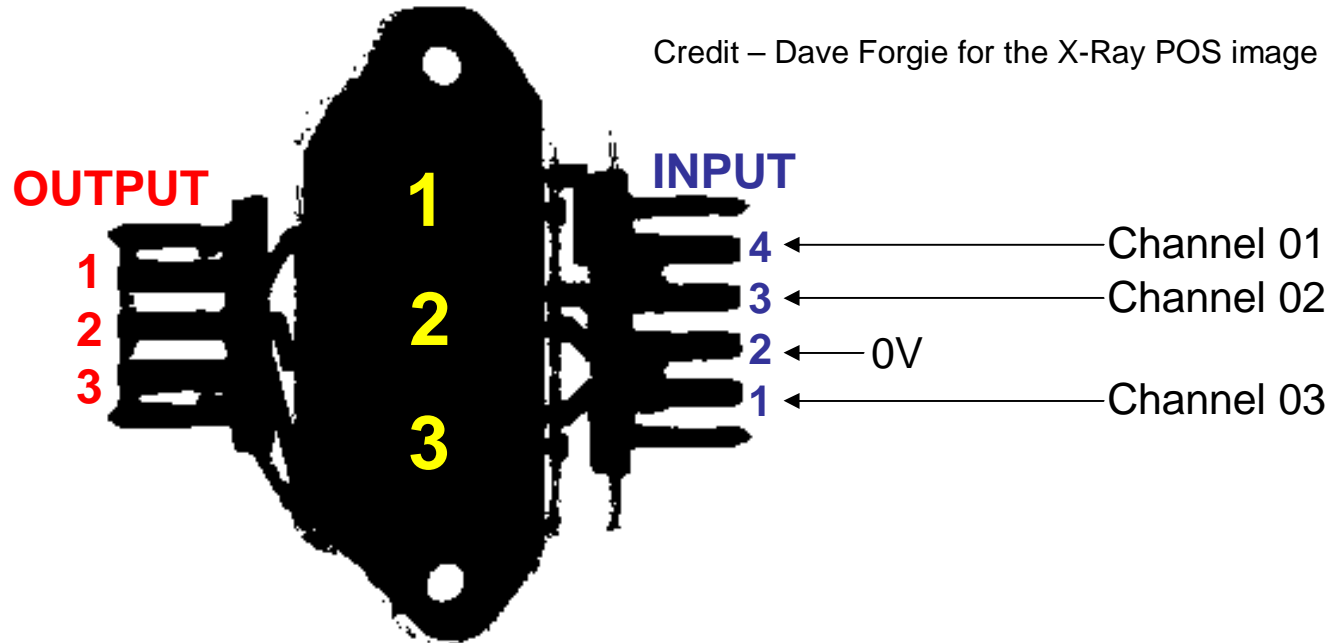
Factory Schematics are WRONG



Corrections shown above – annotated in red...
NOTE also that some variations of wire colour exist

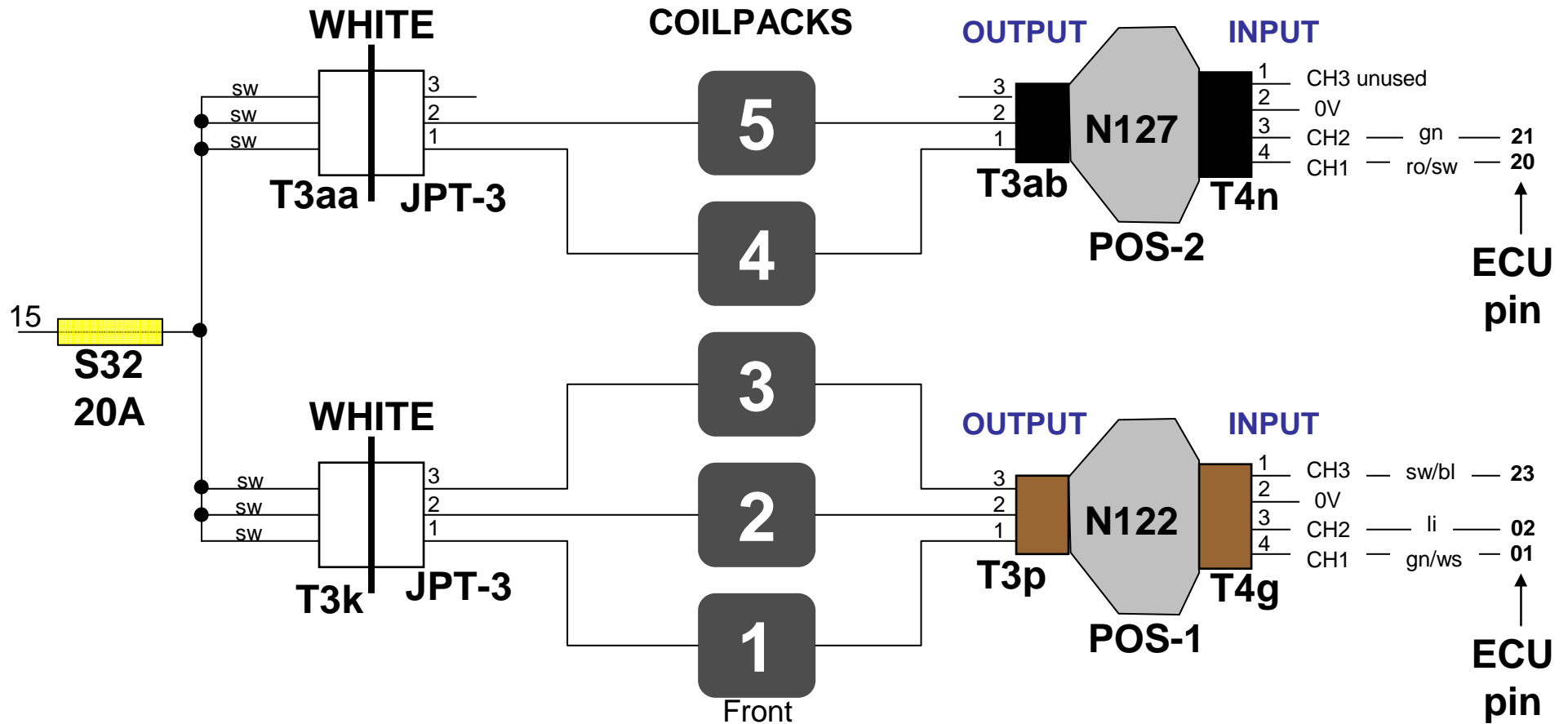
The Correct POS Topology

Credit – Dave Forgie for the X-Ray POS image



Coil Pack per Cylinder	ECU Pin Number / 55	Common Wire Colours	POS-1 (N122) BROWN	POS-2 (N127) BLACK
1	1	gn/ws	Ch 01, T4g/4	-
2	2	li	Ch 02, T4g/3	-
3	23	sw/bl	Ch 03, T4g/1	-
4	20	ro/sw	-	Ch 01, T4n/4
5	21	gn	-	Ch 02, T4n/3

Coilpack wiring from POS-1 & 2

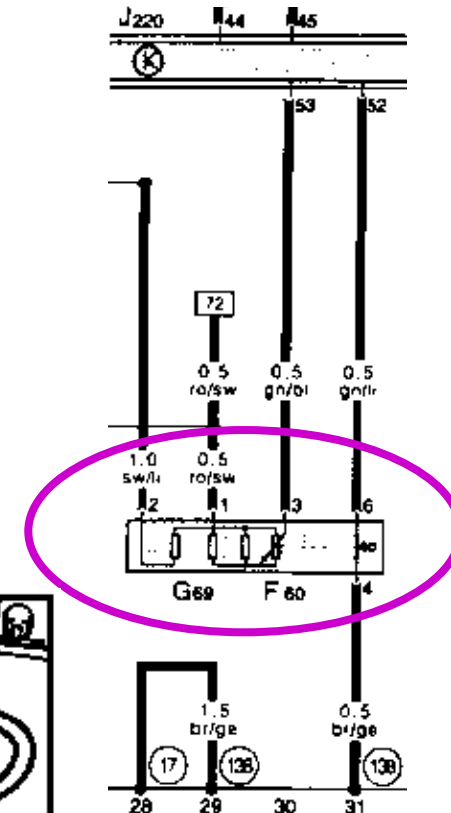
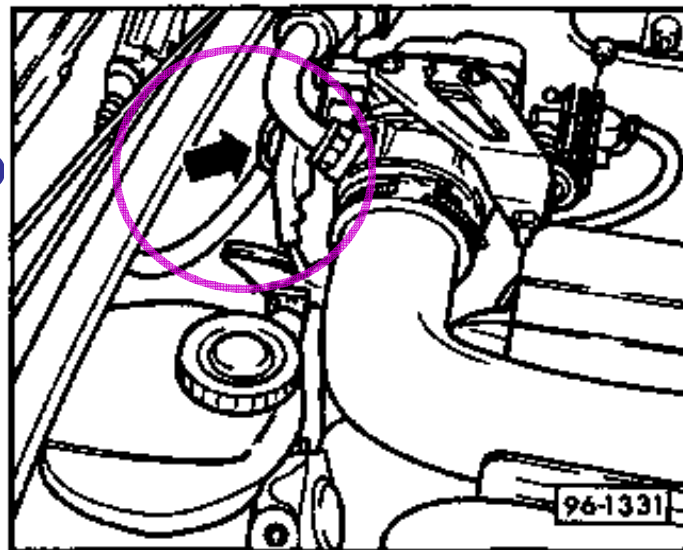


- Coilpacks have integral connector with flying leads that **must** be correctly spliced into JPT-3 connectors as shown logically above.
- Note that POS drawn upside down here to align with cylinder direction.
- POS units **must** have thermal paste on the connection to bulkhead.

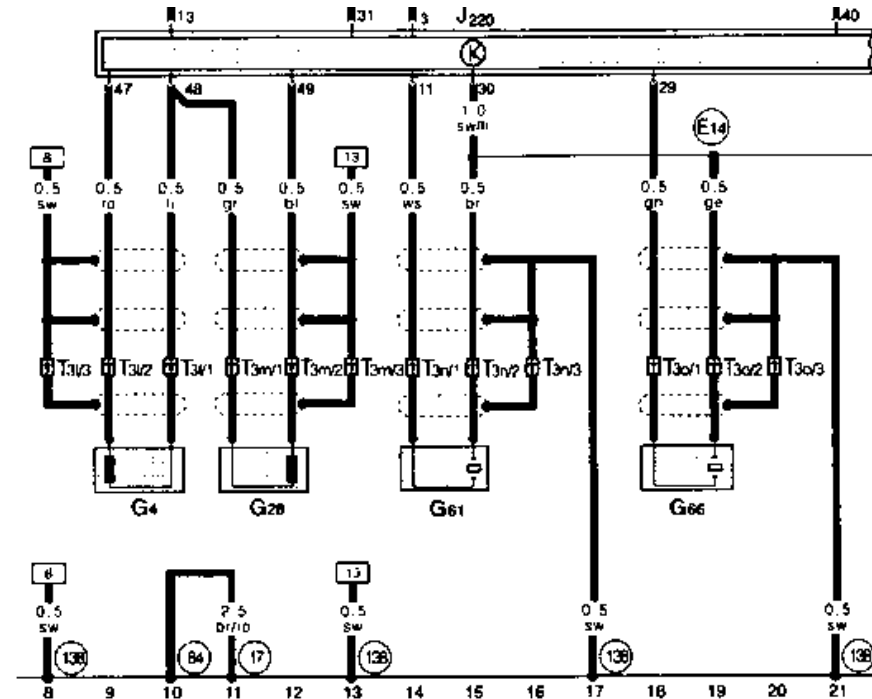
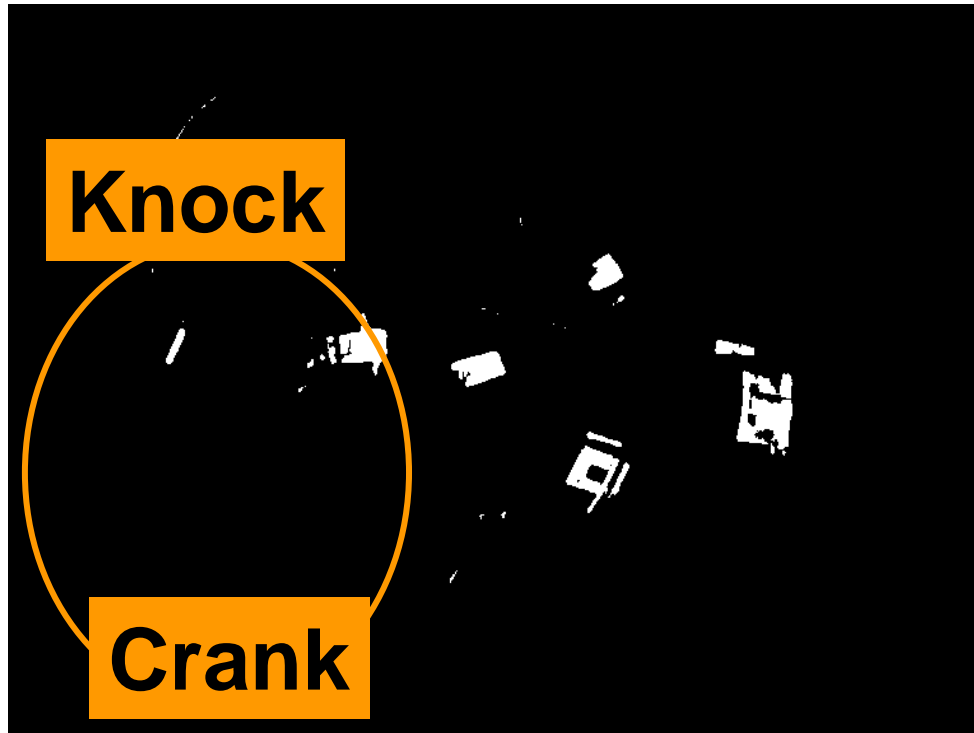
Bundle 2.2.A.2 – Throttle Position Sensor



Connects directly to
the throttle body



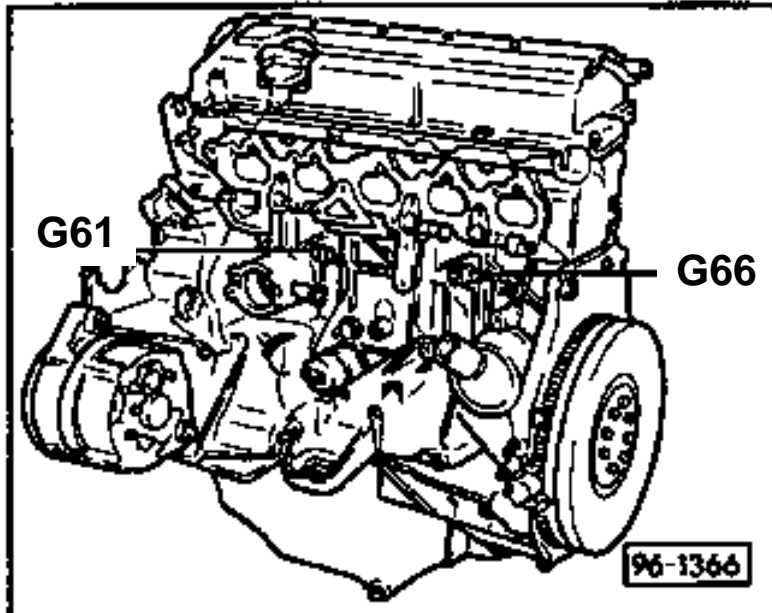
Bundle 2.2.A.3 – Knock & Crank Sensors



- BLACK : T3l → Crankshaft Position Sensor (G4)
- GREY : T3m → Crankshaft Speed Sensor (G28)
- GREEN : T3n → Knock Sensor 1 (G61)
- BLUE : T3o → Knock Sensor 2 (G66)

Note that other coloured knock sensors were used in different years. Check your own wiring carefully.

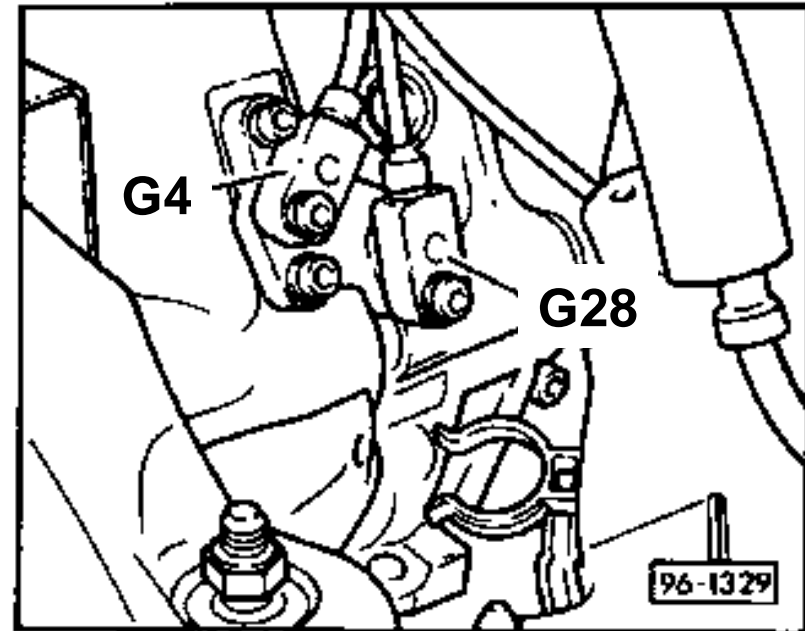
Locations – Knock & Crank Sensors



Location – Left side of engine block

G61 - Knock-1 (Cyls 1-2-3)

G66 - Knock-2 (Cyls 4 & 5)



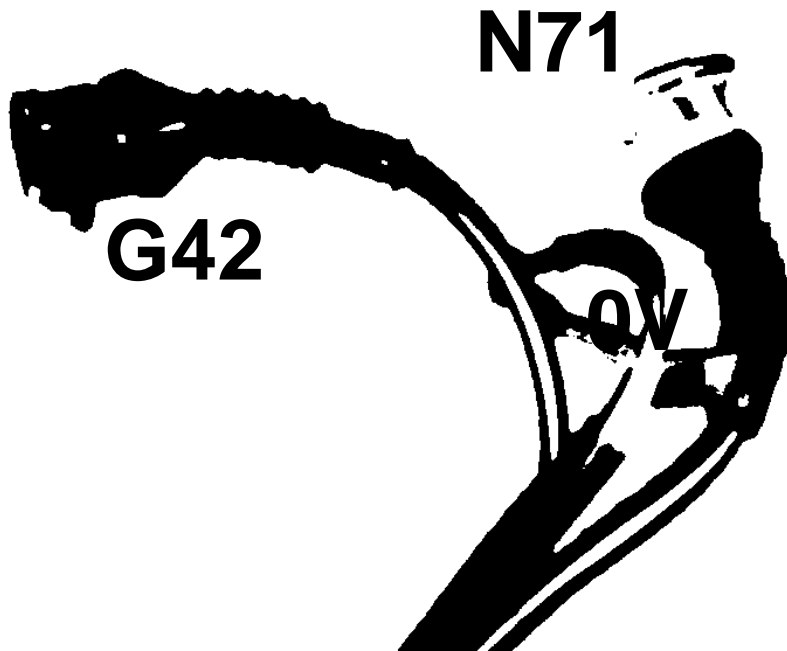
Location – Left side of engine block

Low down near bellhousing.

G4 - Crank Position Sensor

G28 - Crank Speed Sensor

Bundle 2.2.B.1 – IAT, ISV & Earth

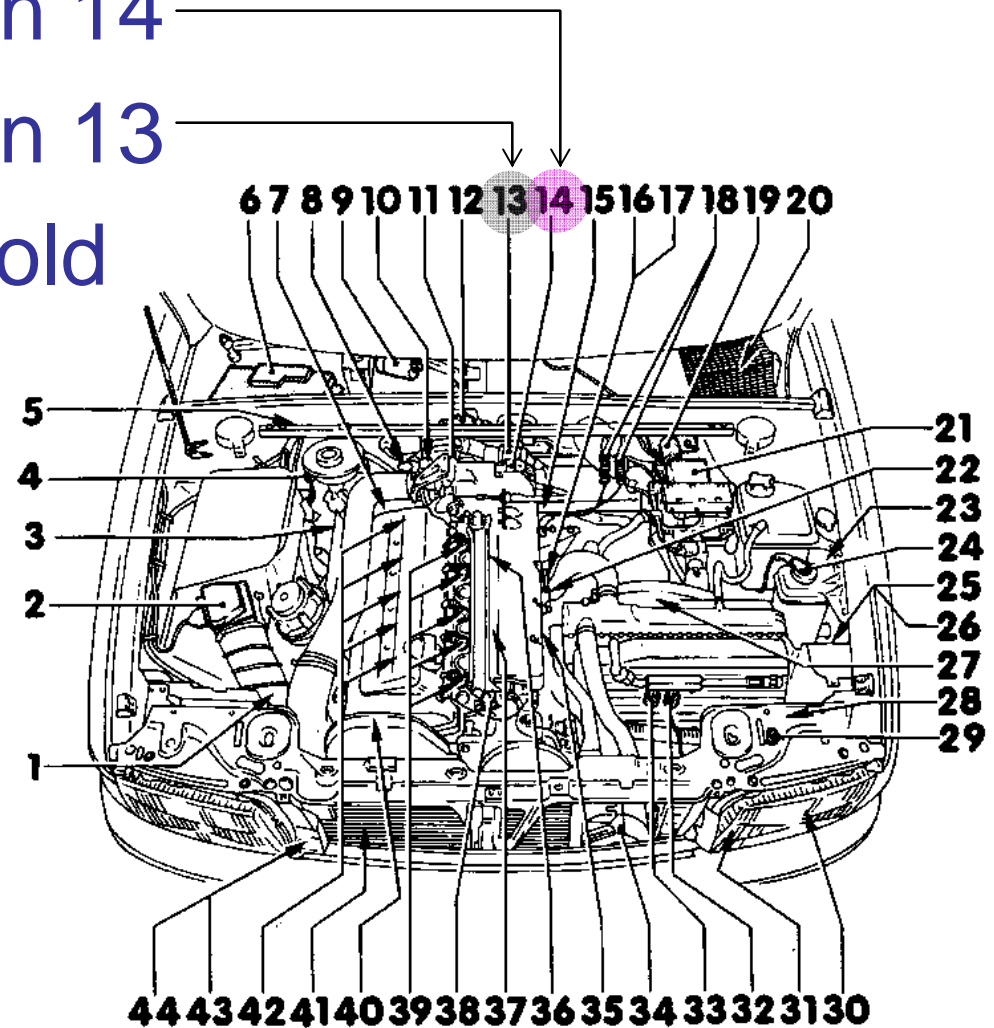
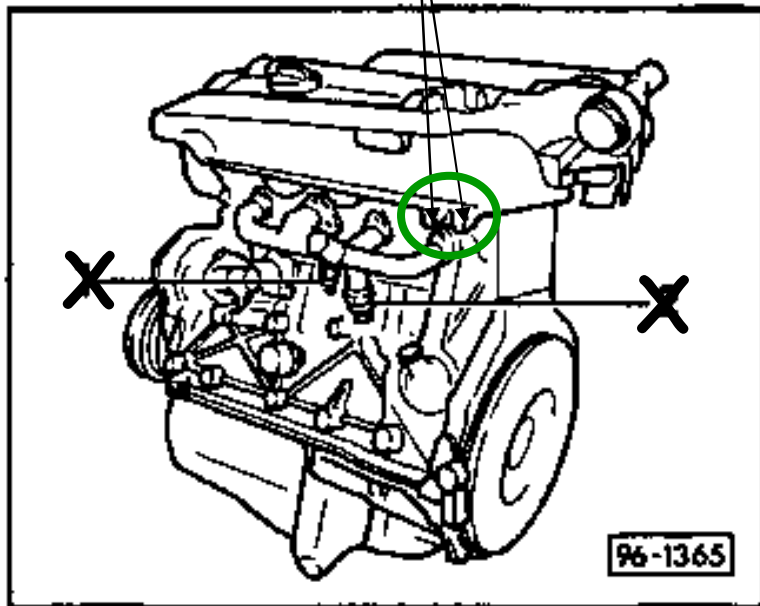


- **G42** – Intake Air Temp Sensor
- **N71** – Idle Stabiliser Valve
- Earth Points at inlet manifold. Ensure each eyelet has two wires firmly crimped on and that a good clean connection is made with the manifold.

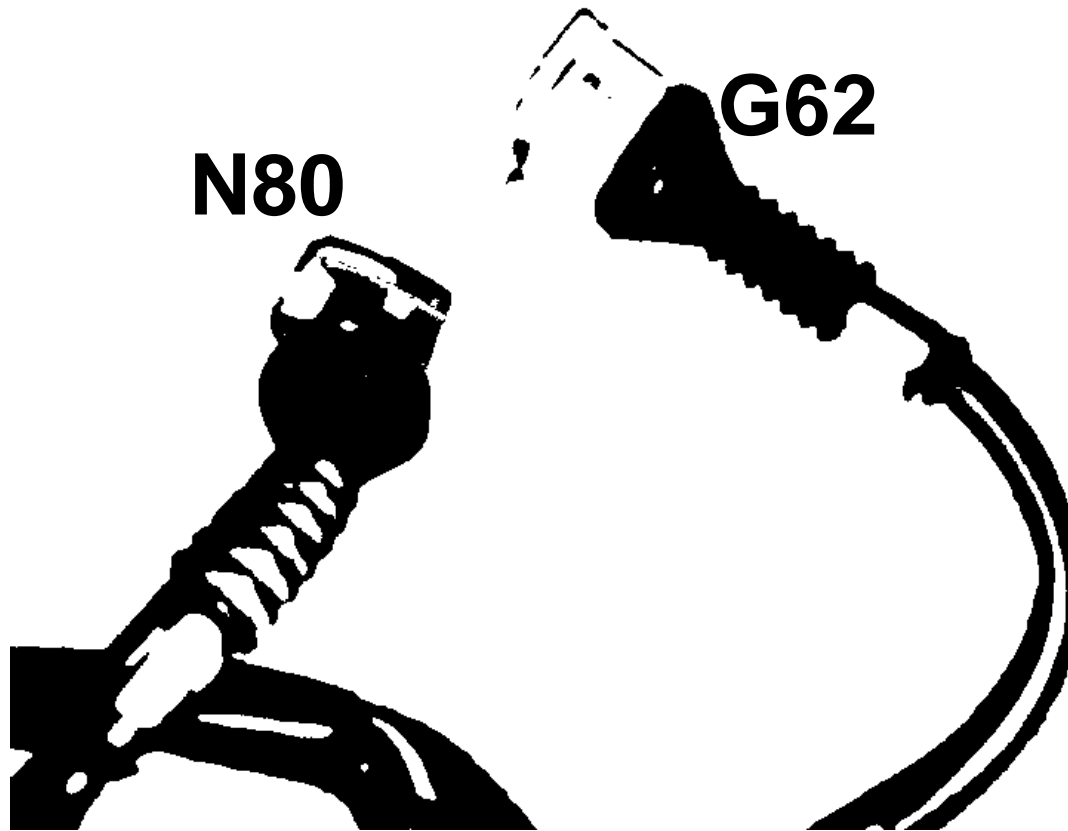
Tip – Check connectivity from this earth point to all of the others in loom.

Locations – IAT, ISV & Earths

- **G42** - IAT – Location 14
- **N71** - ISV – Location 13
- Earth on inlet manifold

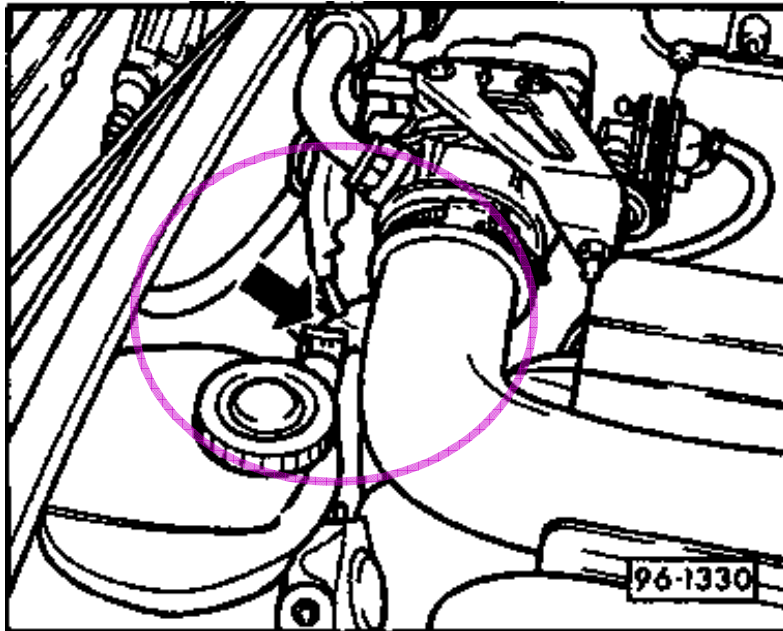


Bundle 2.2.B.2 – EVAP & CTS

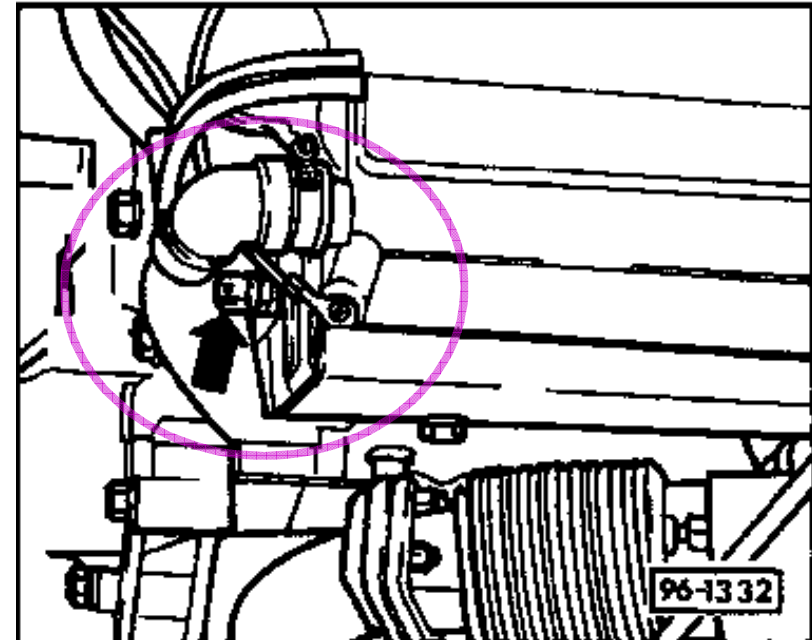


G62 – Coolant Temp Sensor
N80 – EVAP purge valve

Locations : EVAP & CTS



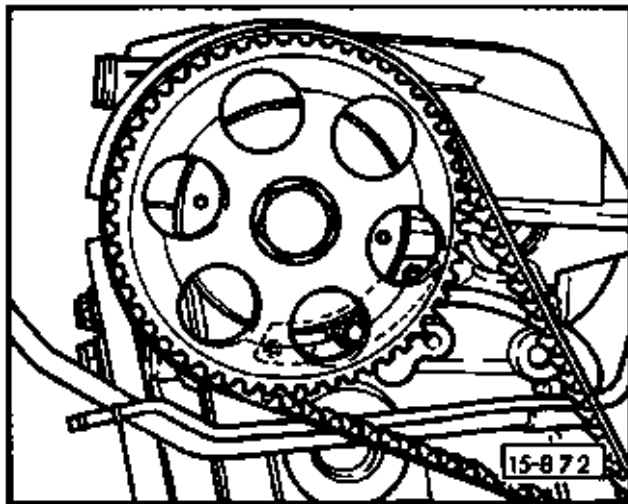
N80 – EVAP purge valve
Behind / Under Inlet pipe



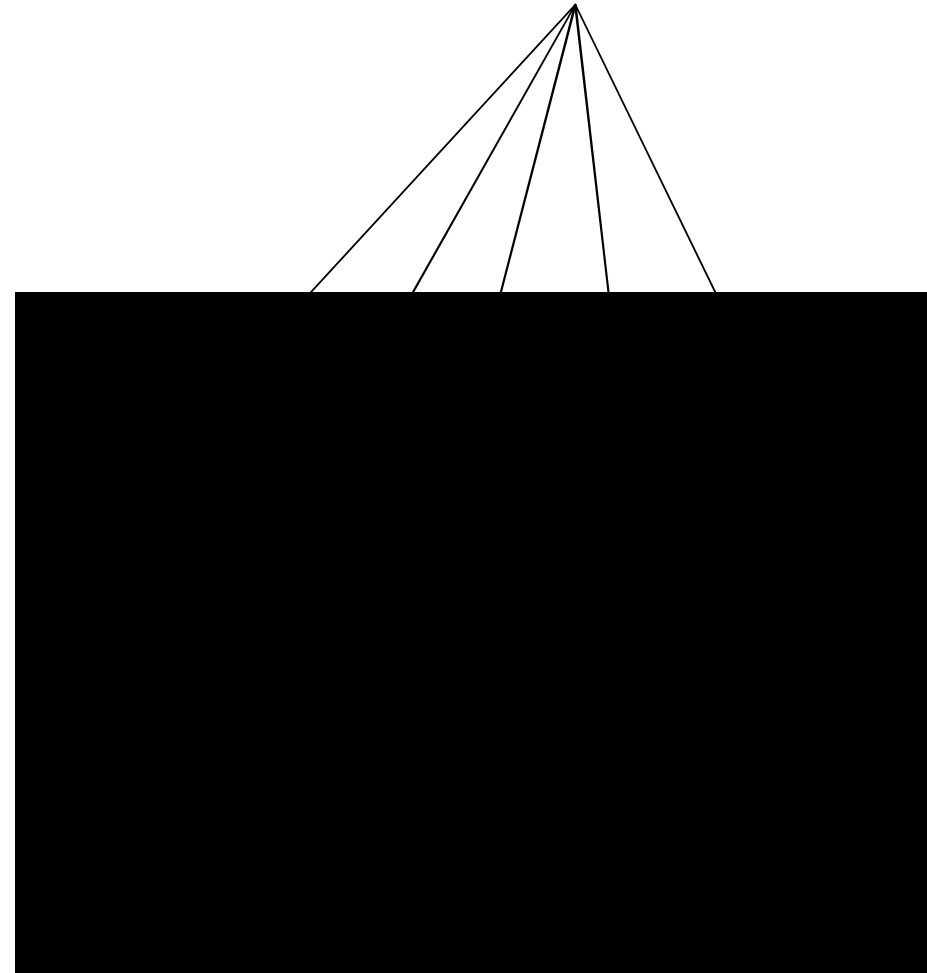
G62 – Coolant Temp Sensor
Rear of cylinder head

Bundle 2.2.B.3 – Injectors & Camshaft

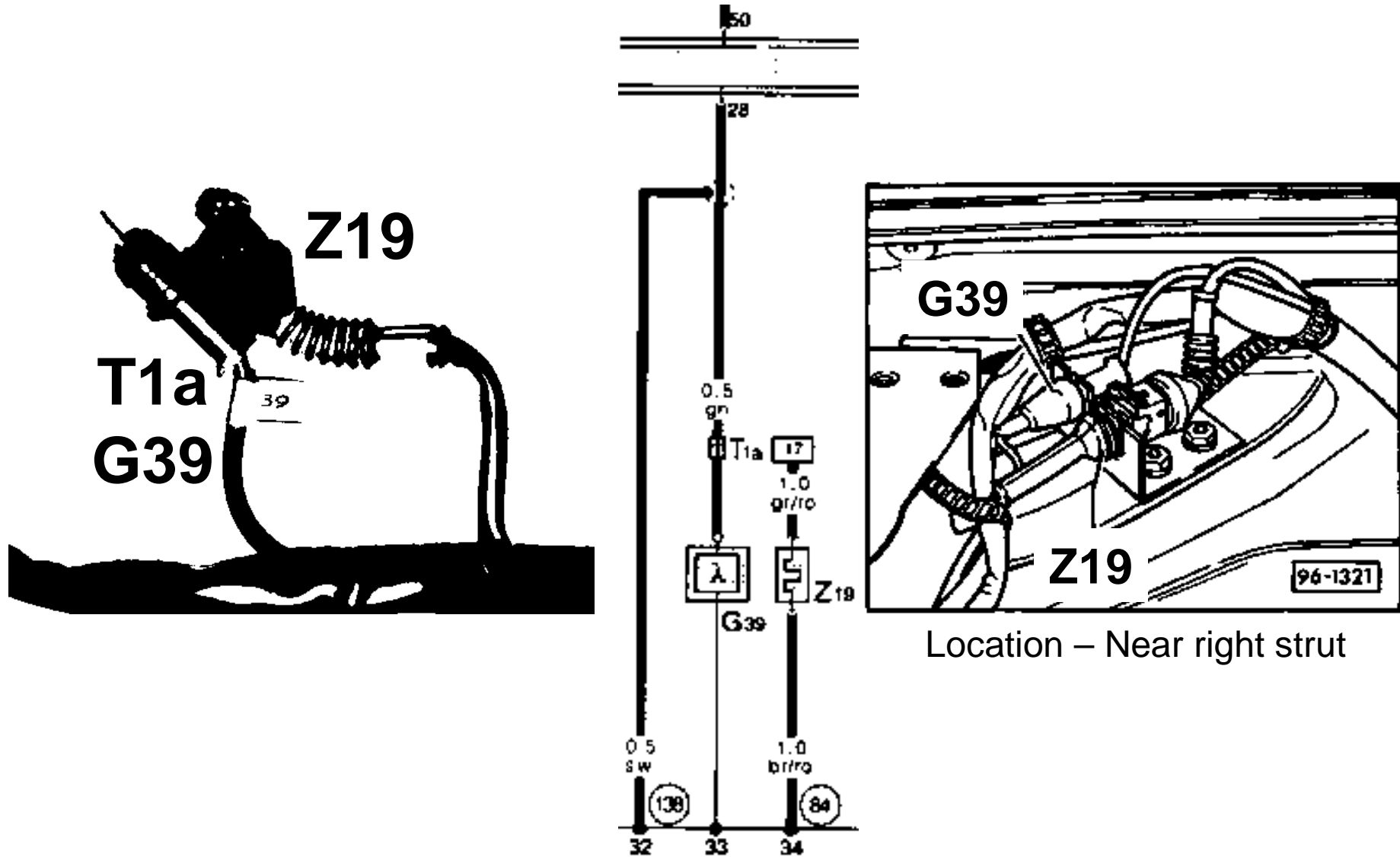
Fuel Injectors for cylinders 1 through 5 from left to right



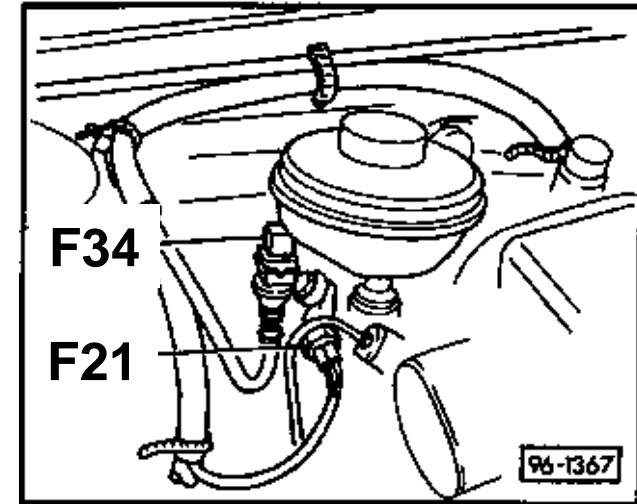
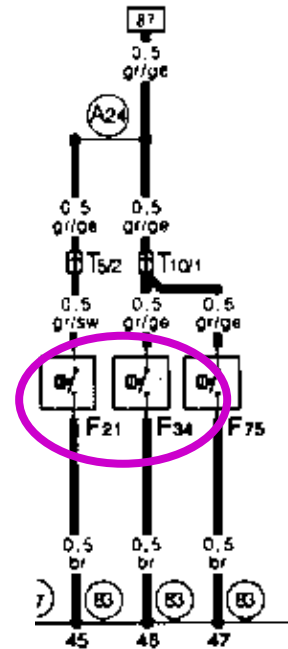
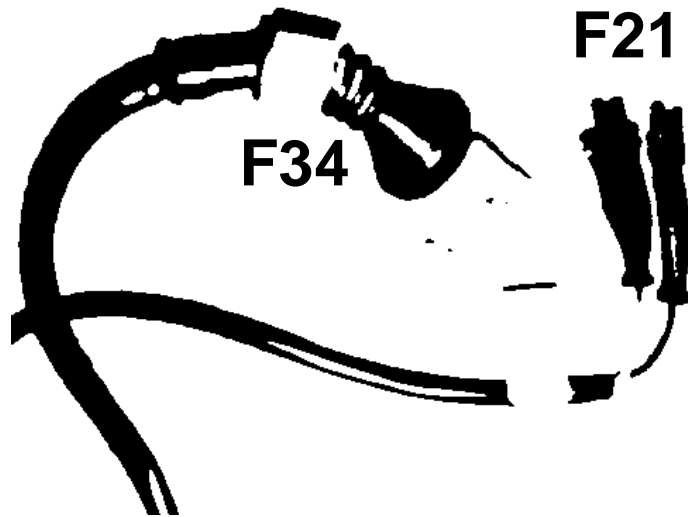
G40 Location – Under Camshaft Pulley



Bundle 2.3 – Lambda Probe



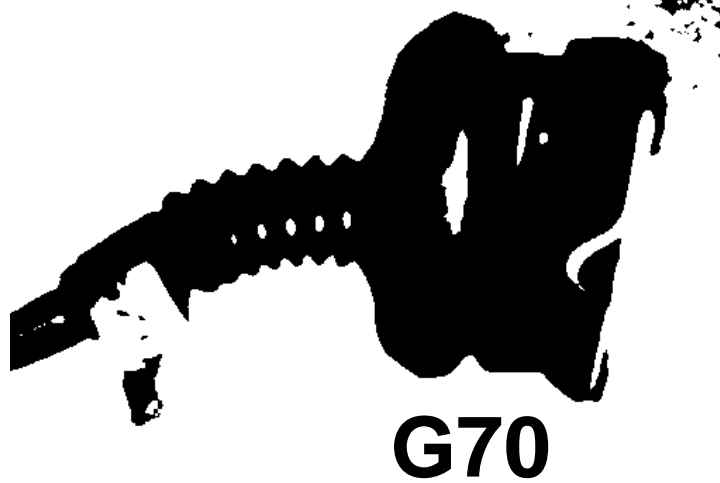
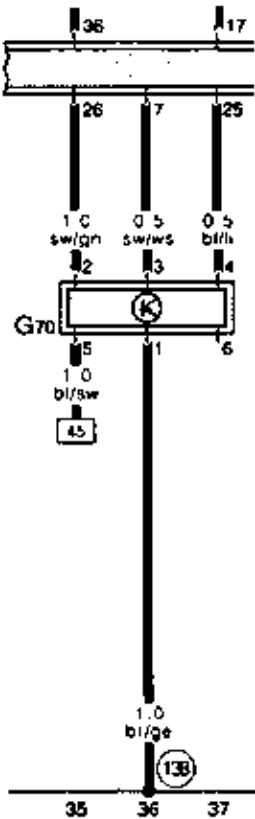
Bundle 2.4 – Brakes & Servo



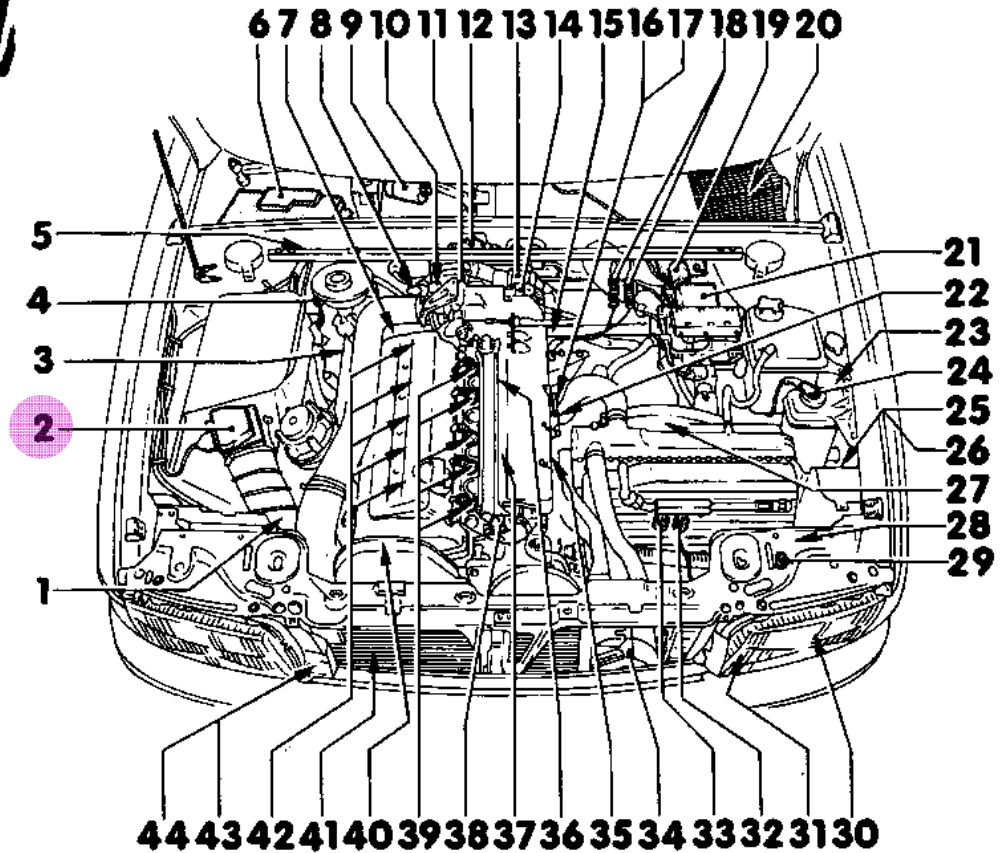
- **F21** – two spades onto hydraulic servo unit
- **F34** – 2-pin JPT (grey) for brake fluid level

TIP – Test connectivity to T5, T10 & 0V

Bundle 2.5 - MAF

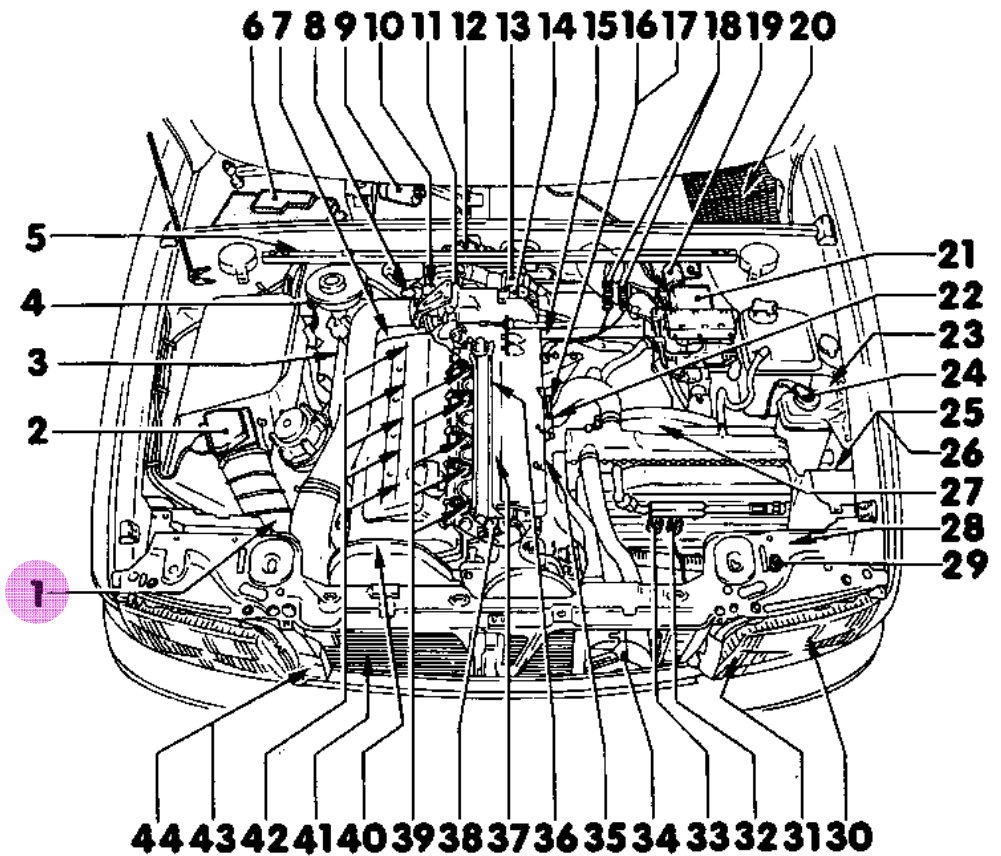
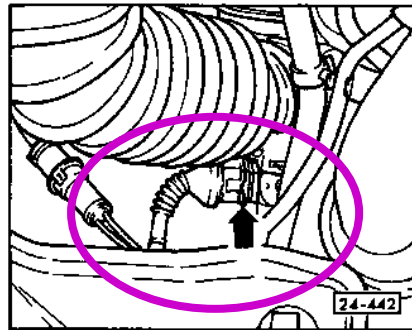
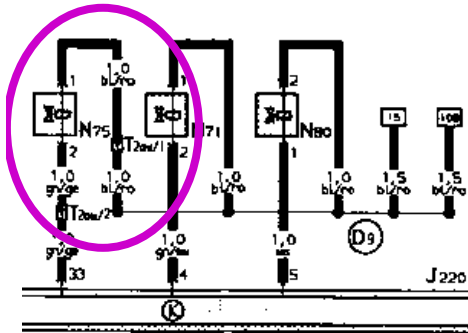


G70



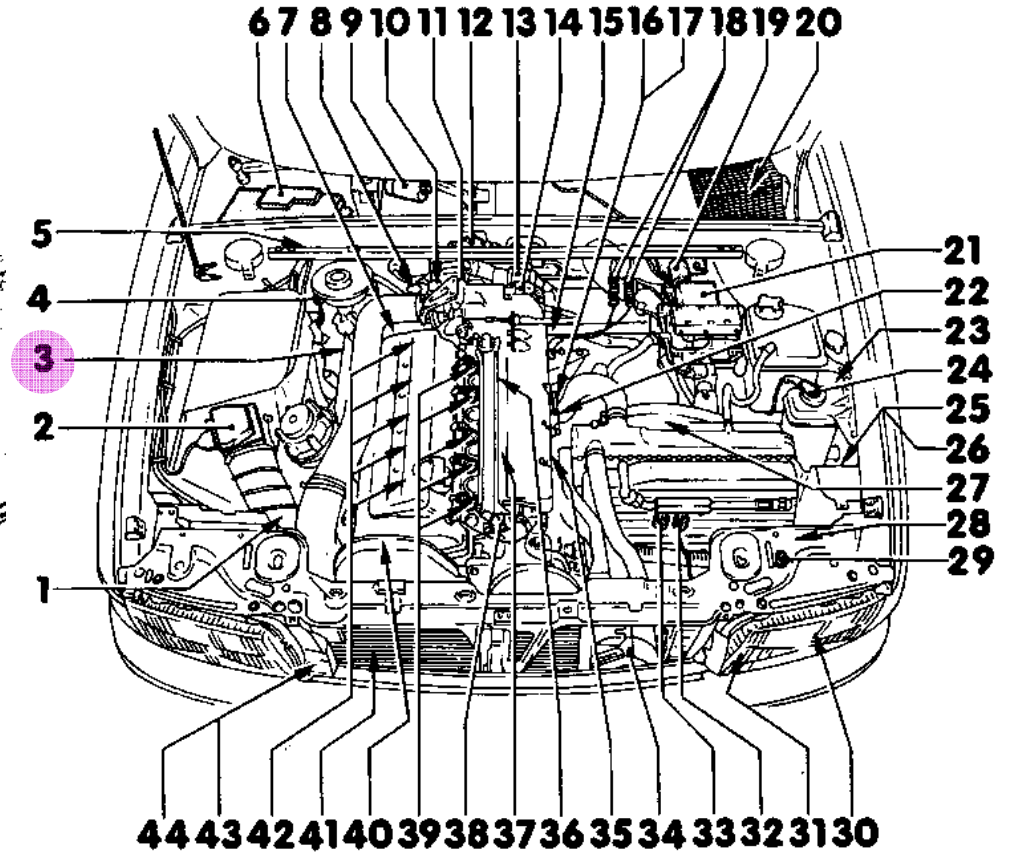
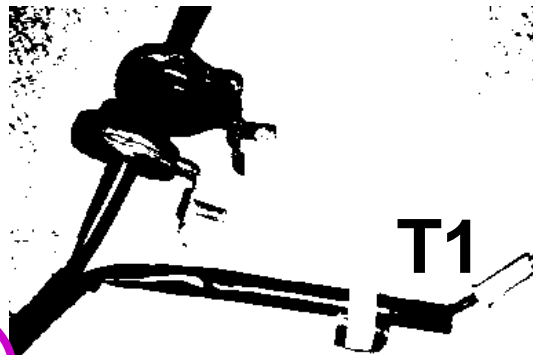
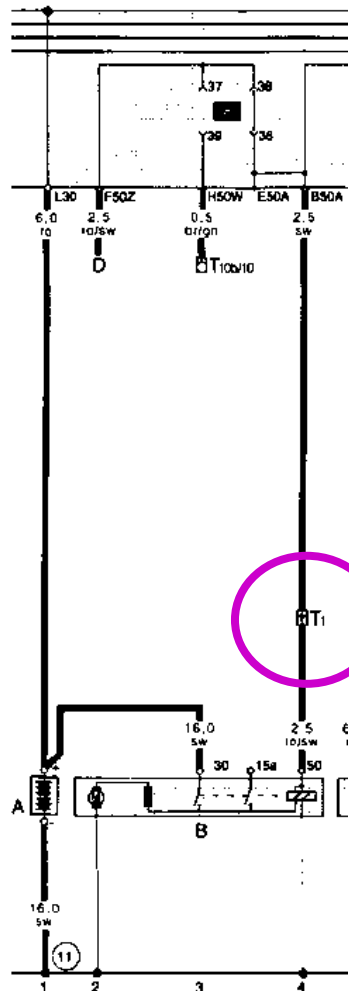
- Self explanatory
 - Location 2 at airbox

Bundle 2.6 - WGFV



- **N75 (WGFV)** connects to this plug **T2aw** via a small extension loom (not shown here). 2-pin JPT at WGFV.

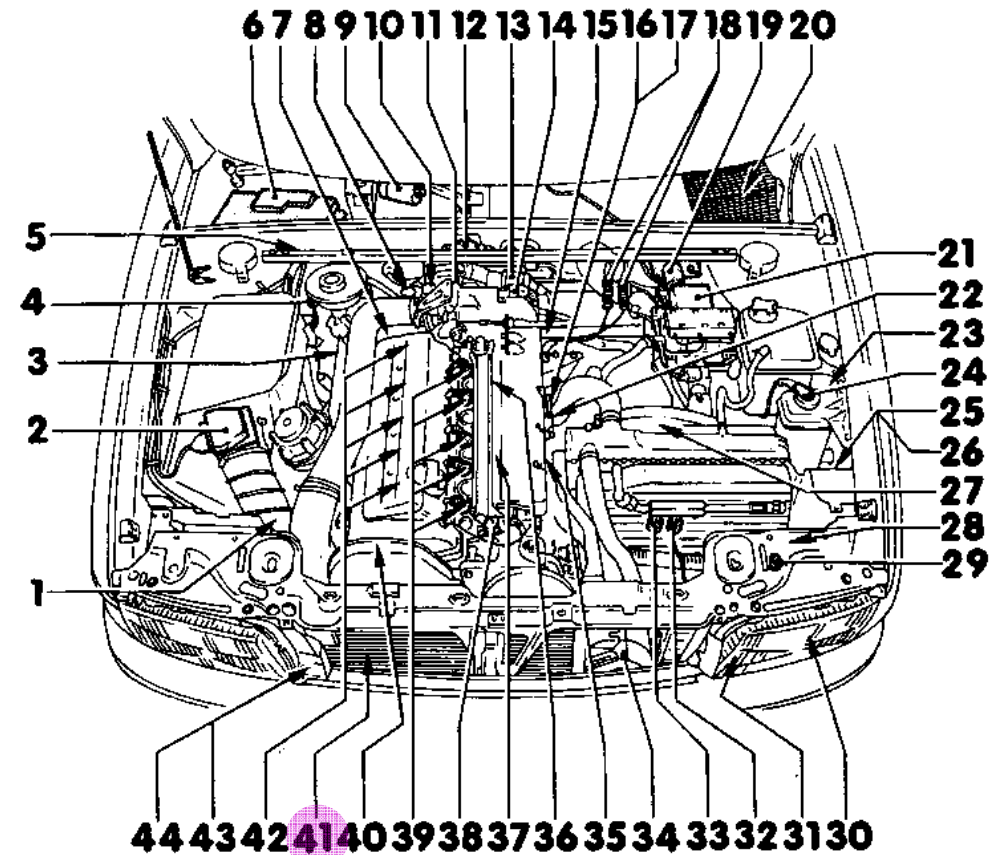
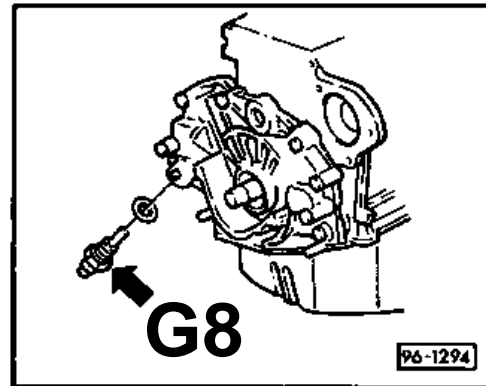
Bundle 2.7 – Starter Solenoid



Location – Right side of engine, below exhaust manifold

- T1 – red/black wire on white spade to starter
- TIP** – Test connectivity to B plug at the fusebox (Bundle 5)

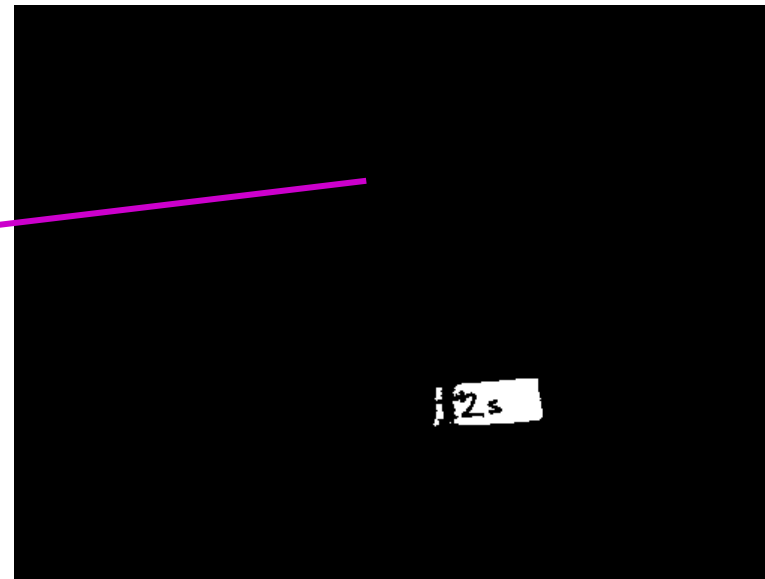
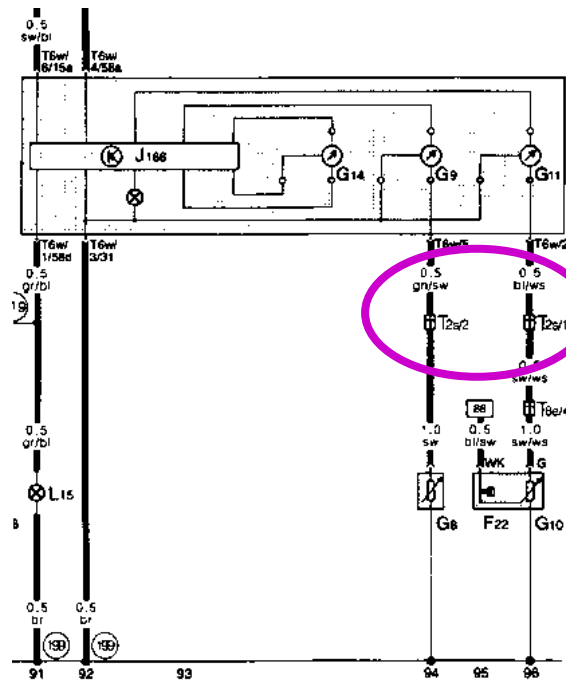
Bundle 2.8 – Oil Temp Sender



- **G8** connects to the oil pump
 - Schematic shown on next page

Bundle 3 – Centre Console

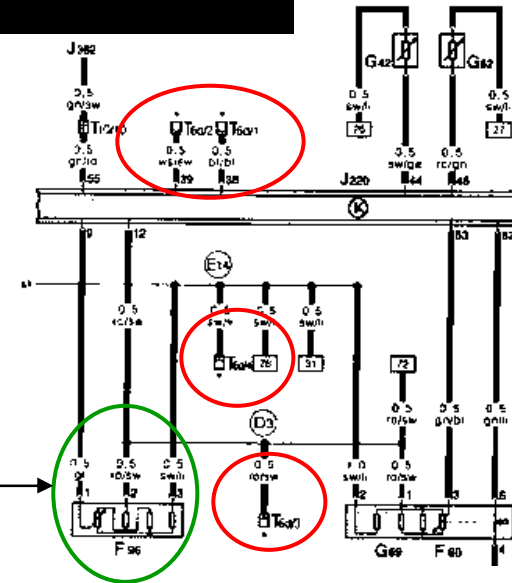
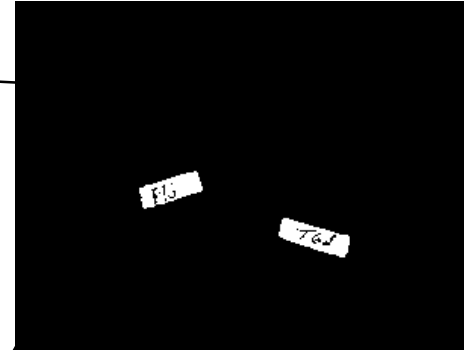
- Bundle 3 goes behind the centre console
 - Referred to as **T2s** on the ABY schematics
 - For oil temperature & oil pressure gauges



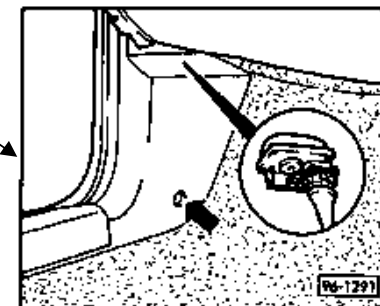
- **TIP** - Test connectivity to sensors as follows :
 - Black wire connects directly to **G8** (Bundle 2.8)
 - Black/White wire connects to **G10** (Bundle A1 via T8e/4)

Bundle 4 – Coding Plug & F96

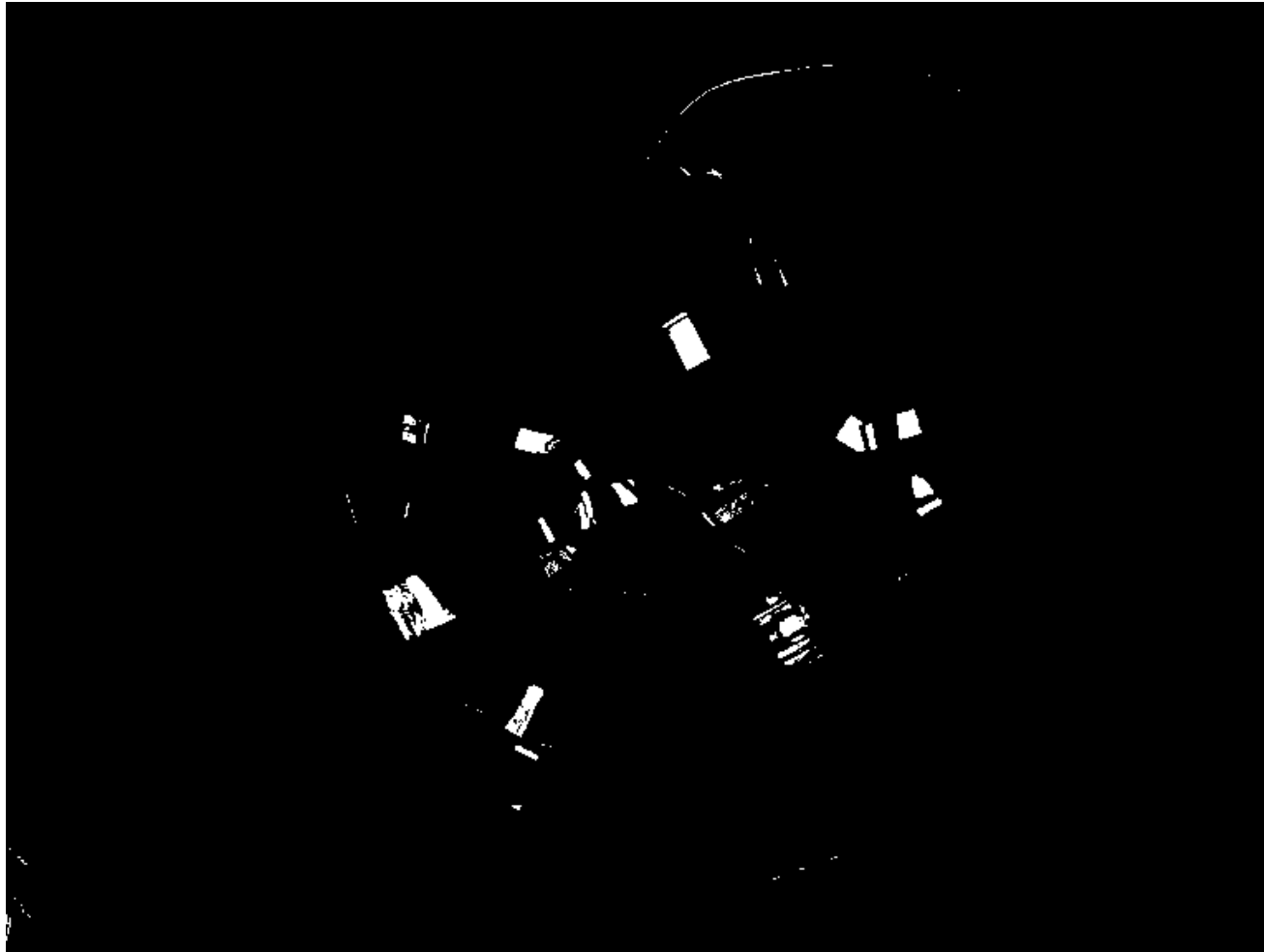
- Coding Plug – BLACK
 - Notated as **T6d**
 - Not actually used on the S2 or RS2 in most territories
 - Allegedly used in some LHD territory as a speed limiter
 - Was employed on UrS4/S6 (AAN engine) to effect a speed limiter
 - If in any doubt, leave this plug disconnected



- Ambient Pressure Sensor
 - Notated as **F96**
 - A 3-pin JPT multi-pin plug which is missing on this loom (easy fixed)
 - Resides inside left A-pillar



Bundle 5 – Fusebox Spaghetti



Schematic References :

J155 Relay
T5 and T10
Earth point '32'
T1f - blue/red wire
T6r - black multi-pin
T5h - red multi-pin
87a - a black spade
S24 - blue
S25 - red
S27 - brown
S28 - white
S32 - purple
L30 - large white spade
O – grey/green wire
B - black multi-pin
M30ac - green spade
T2x - black (OBD power)
T2y - blue (OBD blink)
Eyelet - OBD L-wire

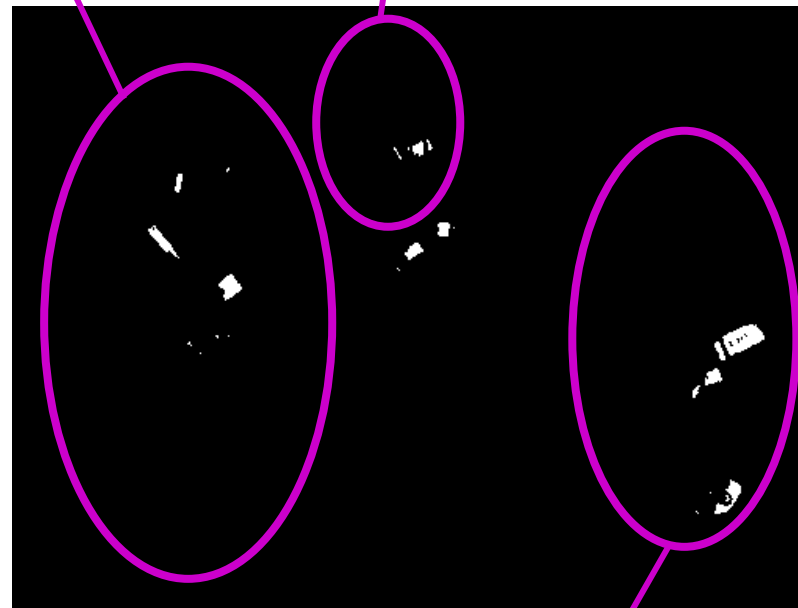
Three sub-groupings for Bundle 5

- 5.1 – Main Fusebox (CEP)

- 87a - a black spade
- B - black multi-pin
- L30 - large white spade
- M30ac - green spade
- O – grey/green wire
- S24 – blue
- S25 – red
- S27 – brown
- S28 – white
- S32 – purple
- T2x - black (OBD power)
- T2y - blue (OBD blink)
- Eyelet - OBD L-wire

- 5.2 – Intermediate plugs

- T1f - blue/red wire
- T6r - black multi-pin
- T5h - red multi-pin

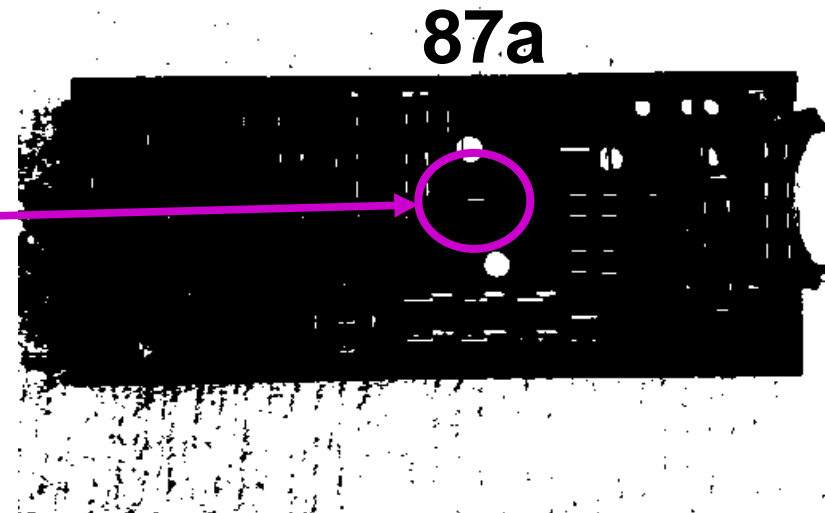
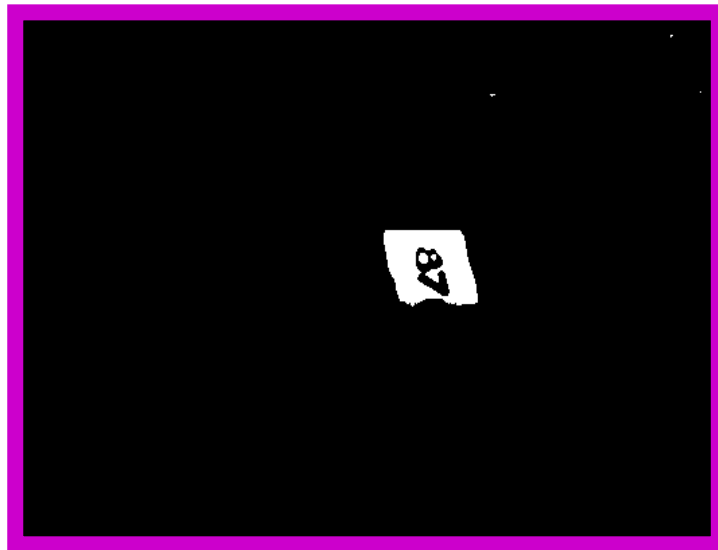


- 5.3 – Auxiliary panel

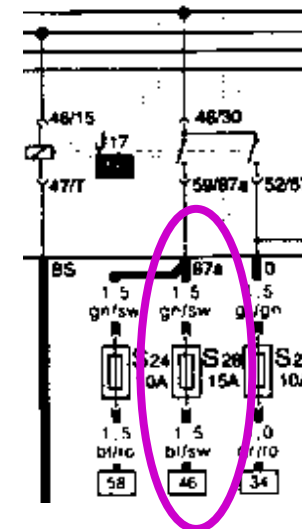
- J155 - Afterrun Relay
- T5 & T10 - Black multi-pin
- Earth point '32'

You've got this far – don't panic now 😊

Bundle 5.1 – Terminal 87a



- 2 x green/black wires in black spade
- Attach this to **87a** on rear of CEP
- Provides 12V to **S28** when fuel pump ON
- Note that if your CEP does not have the **87a** terminal you can parallel this with the **O** wire. You will also have to remove pin 59 from the fuel pump relay in this case



Bundle 5.1 – Multiplug B



Part Number = 443 972 994

Pin-Out As Follows (mm²):

BS = brown / green (0.5)

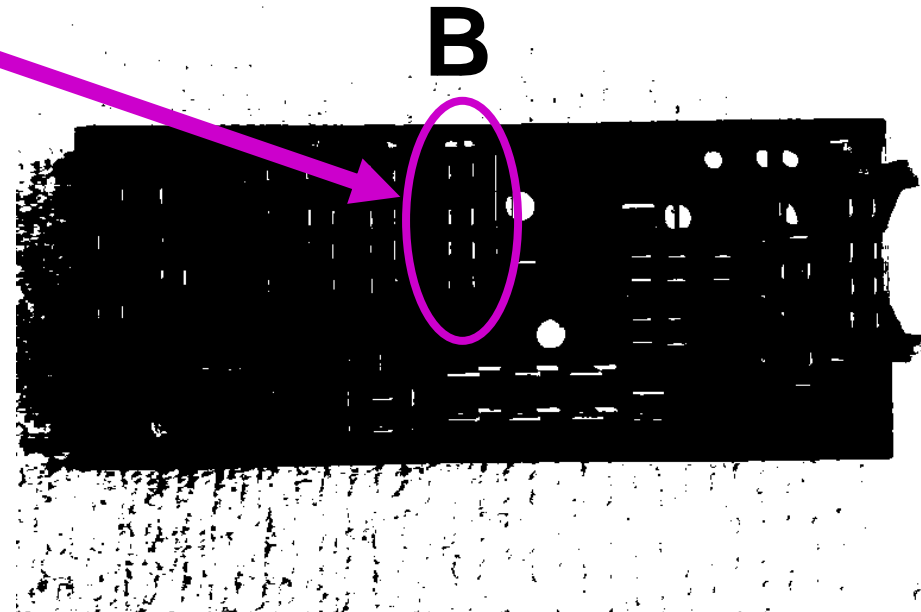
B15 = black (1.5)

B15a = 2 x black/blue (1.0)

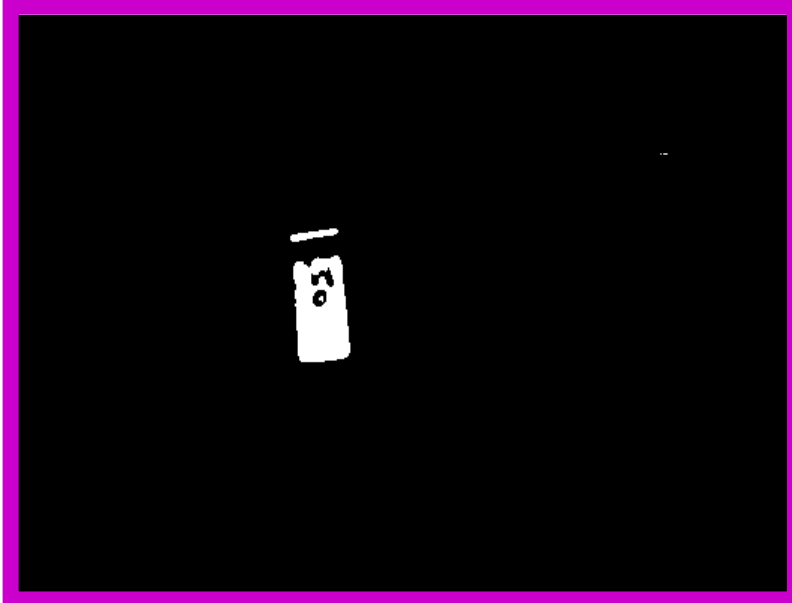
B50a = black (2.5)

B53c = red/green (1.0)

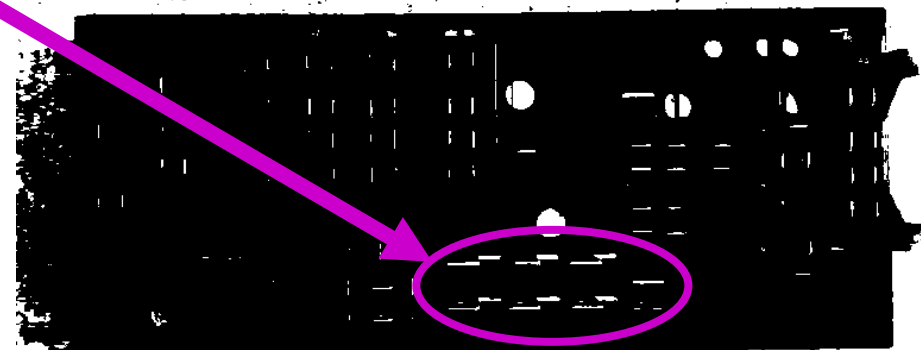
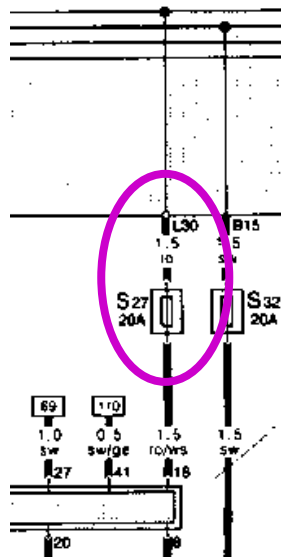
- Connects to CEP
 - Only fits the correct way !



Bundle 5.1 – L30

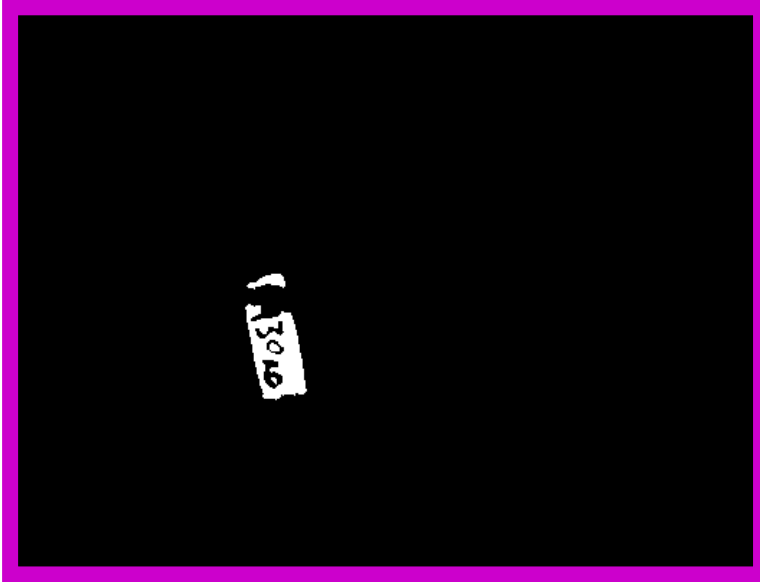


Connect to any free **L30** terminal on rear of CEP. Provides un-switched +12V feed to **S27**.

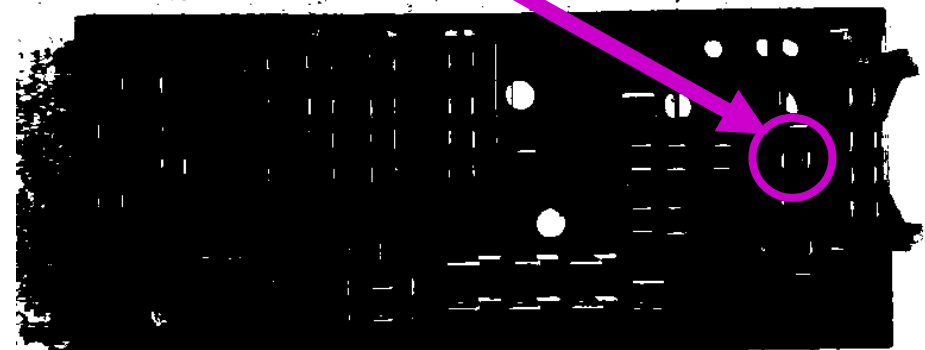
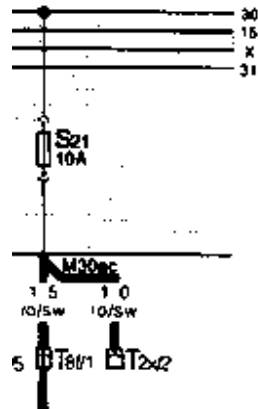


L30

Bundle 5.1 – M30ac

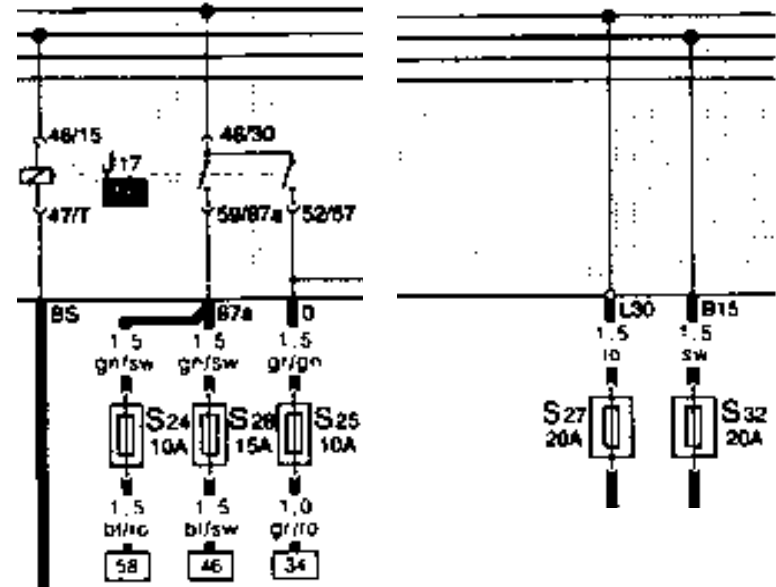
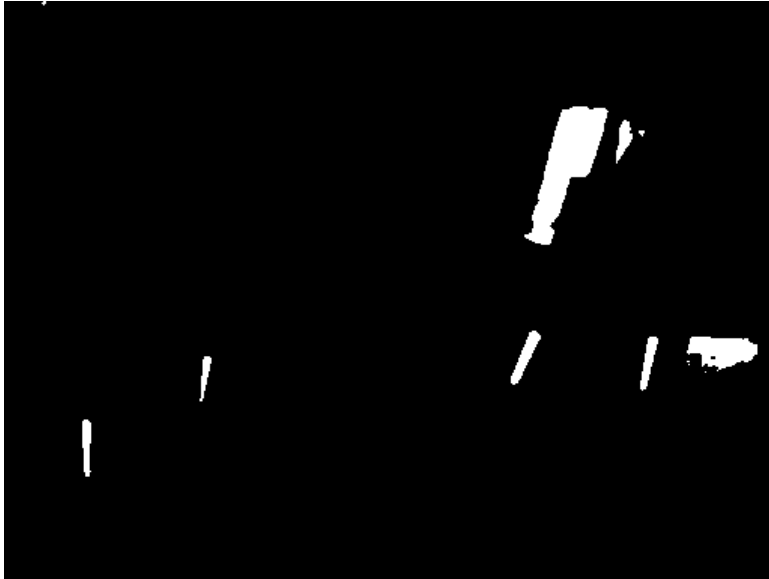


Provides +12V via **S12** to after-run system
And also the +12V power to black OBD plug.



M30ac

Bundle 5.1 – Fuses



Part Number for aux fuse holder = 443 937 530

S24 = 10A protects ISV (**N71**), WGFV (**N75**) & EVAP (**N80**)

S25 = 10A protects lambda probe heater **Z19**

S27 = 20A protects ECU (**J220**) permanent 12V

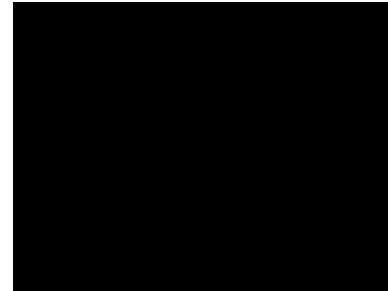
S28 = 15A protects fuel injectors and MAF (**G70**)

S32 = 20A protects coilpacks

Some notes about OBD

- Early loom variants have 2 x OBD connections from the ECU. Both presented on eyelets

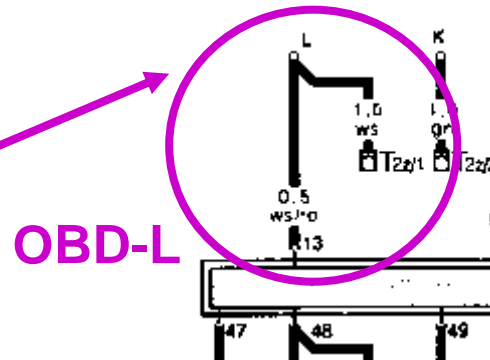
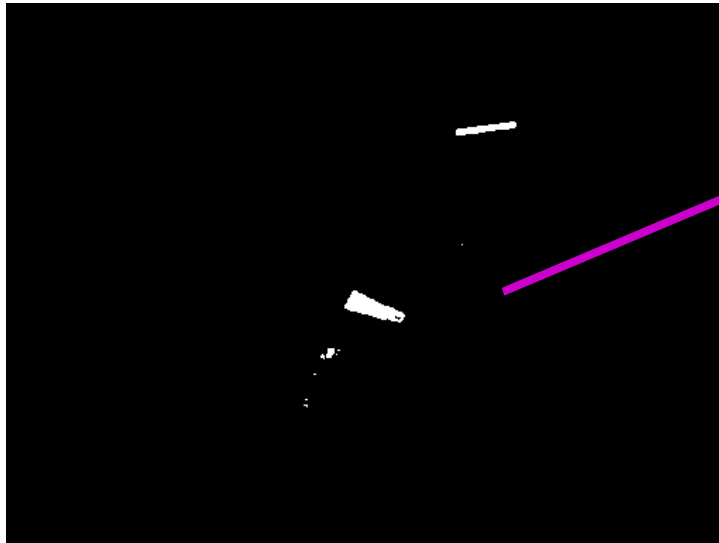
- L wire is green/grey
- K wire is green/red



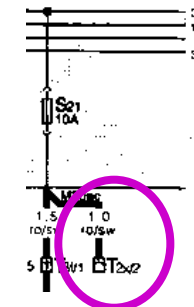
Pic of an earlier ABY loom
Showing the K & L eyelets
Thanks to David Pecoraro

- Later wiring looms had preparation for IMMO-1 integration... These intercept the K-wire via an intermediate terminal.
 - As such there is no K-wire eyelet on the later ABY wiring looms
 - Also note that the K & L wire colour changes from July 1993. Strange...
- A little additional loom extends these eyelets to the white OBD plug for K / L connectivity. Part number = 8A0 971 379
- All variants should have the Blue OBD plug (MIL) on the loom

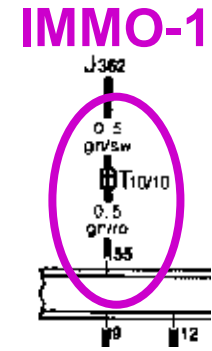
Bundle 5.1 – OBD (Later Loom Shown)



OBD-L



OBD
BLACK



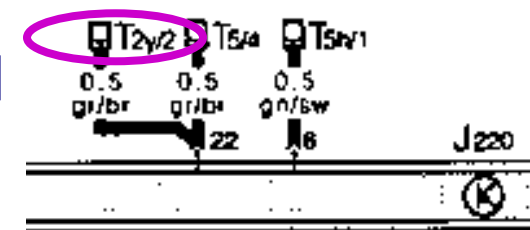
OBD-K

OBD Plug Part Numbers:

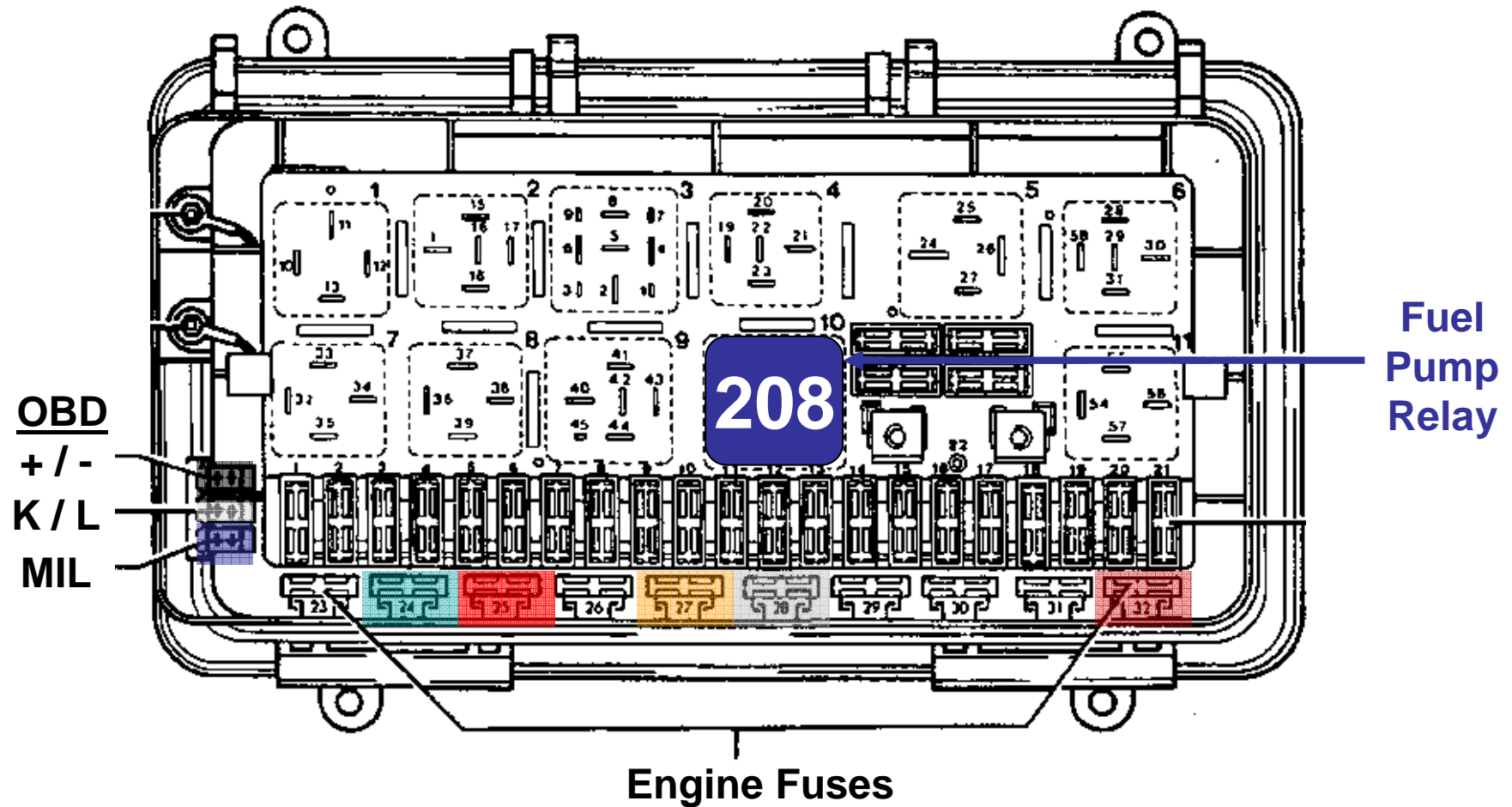
Black = 443 972 580 Blue = 443 972 577 White = 443 972 577 E

- Note the K-wire connects via **T10** to IMMO-1
 - Hence white OBD plug not in the ABY/ADU loom
 - **T10** or **J362** links to K-wire eyelet
- L-wire connects to eyelet in main fusebox
 - From there a small jumper loom connects to white OBD connector
- Black OBD plug is +/- supply fused by **S21**
- MIL / Blink output on blue OBD plug also common with **T5/4**

OBD-BLUE



ABY / ADU Fuses, Relays & OBD

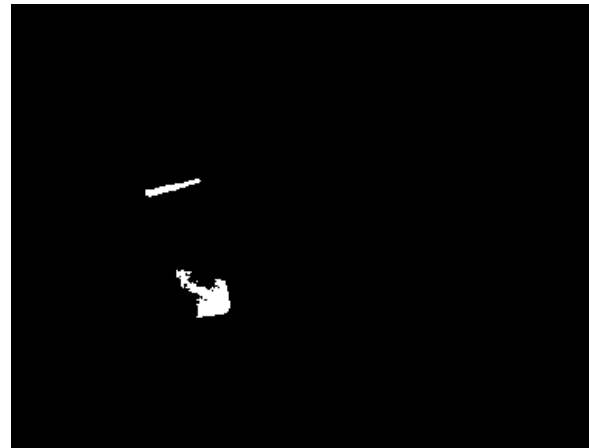


Fuel Pump Relay = 8A0 951 253 B

Bundle 5.2 – T1f (to Reverse Lights)



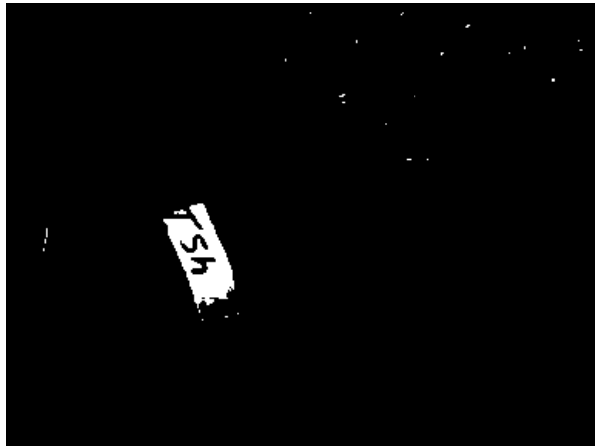
Reverse Lamps



Part = 8A0 972 623

Tip : Test loom connectivity from T8e/1 to T1f

Bundle 5.2 – HVAC Integration via T5h



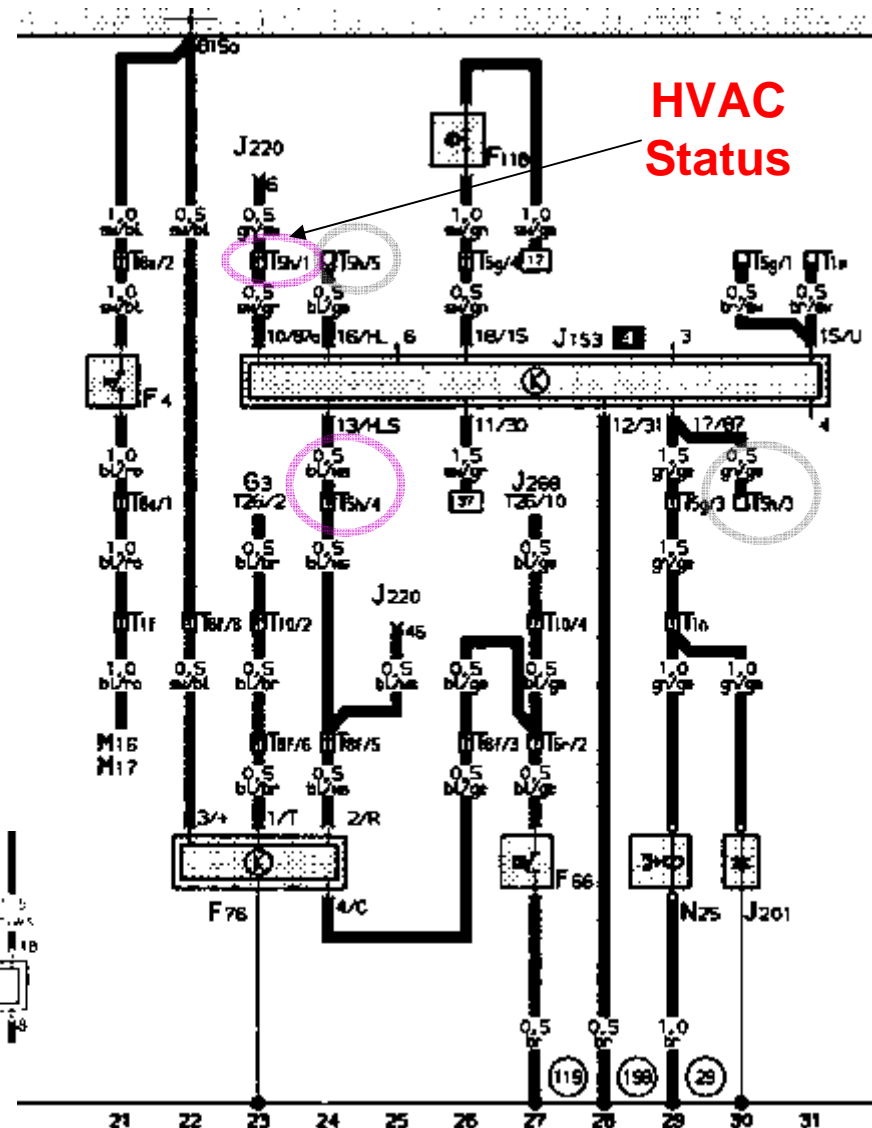
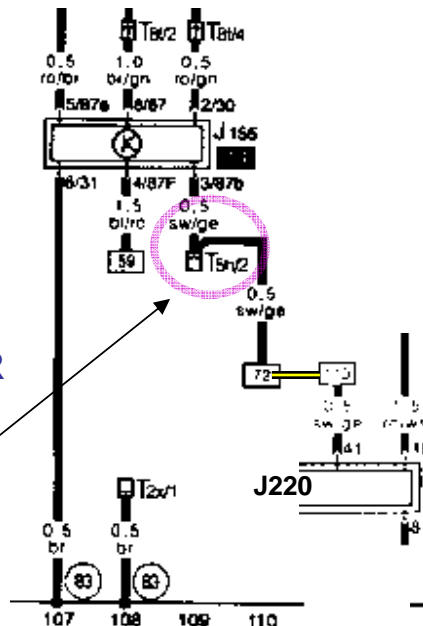
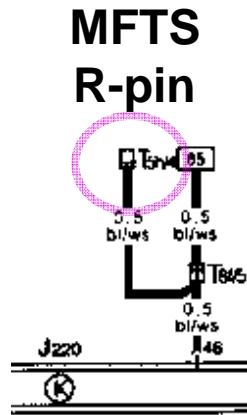
Part = 893 971 635

T5h – Behind Dashboard

- 1 = green / black to J220 #6
- 2 = black / yellow to J220 #41
- 3 = empty on this side
- 4 = blue / white to MFTS (F76) pin R
- 5 = empty on this side

Tech Tip :

This signal ensures the after-run pump cannot operate when the engine is running !



Bundle 5.3 – Auxiliary Panel T5 & T10



T5 = 893 971 835
T10 = 893 971 977

T5 & T10

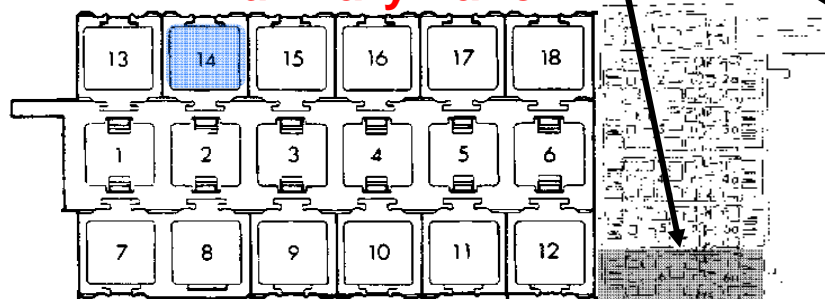
T10 Pin-Out

- 1 – gr/ge (F34 & F75)
- 2 – bl/br (F76) - temp
- 3 – bl/sw (F22) – oil 0.3bar
- 4 – bl/ge (F66 & F76)
- 5 – unused
- 6 – br (0V)
- 7 – li (J220) - rpm
- 8 – ro/ge (G22)
- 9 – ws/bl (VSS)
- 10 – gn/ro (K-wire) – White OBD and/or IMMO-1

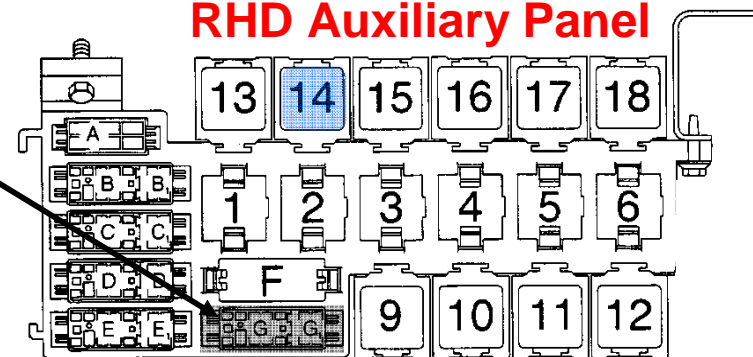
T5 Pin-Out

- 1 – ws/gr (F1) – oil 1.8bar
 - 2 – gr/sw (F21)
 - 3 – br/sw* (J220) – fuel use
 - 4 – gr/br (MIL) – Blue OBD
 - 5 – unused
- * or bl or bl/sw

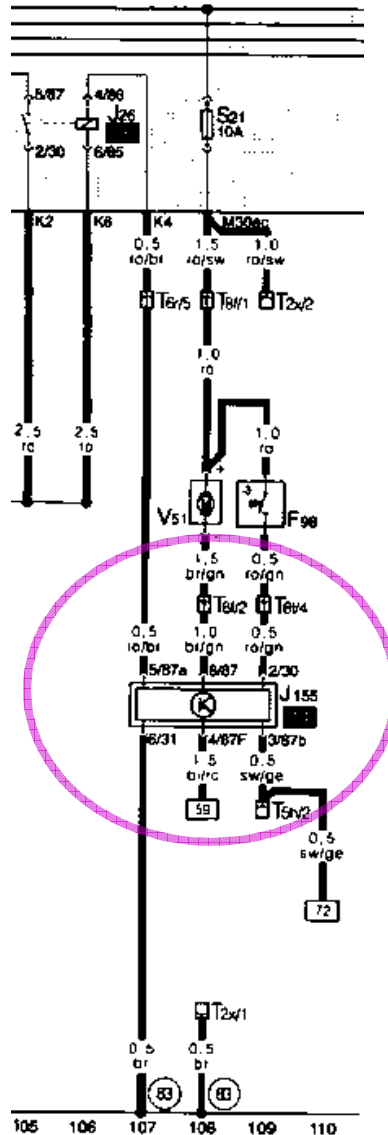
LHD Auxiliary Panel



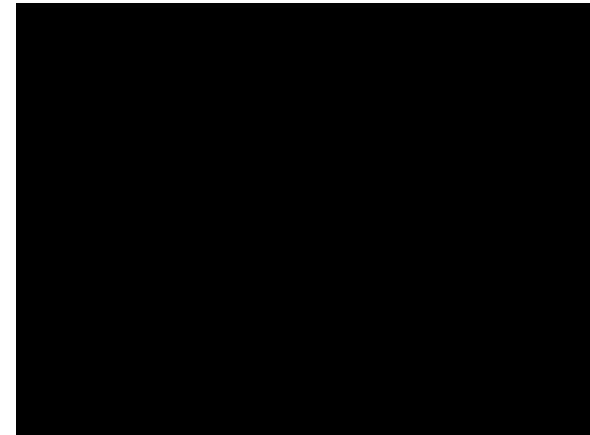
RHD Auxiliary Panel



Bundle 5.3 – Auxiliary Panel, J155 & 0V

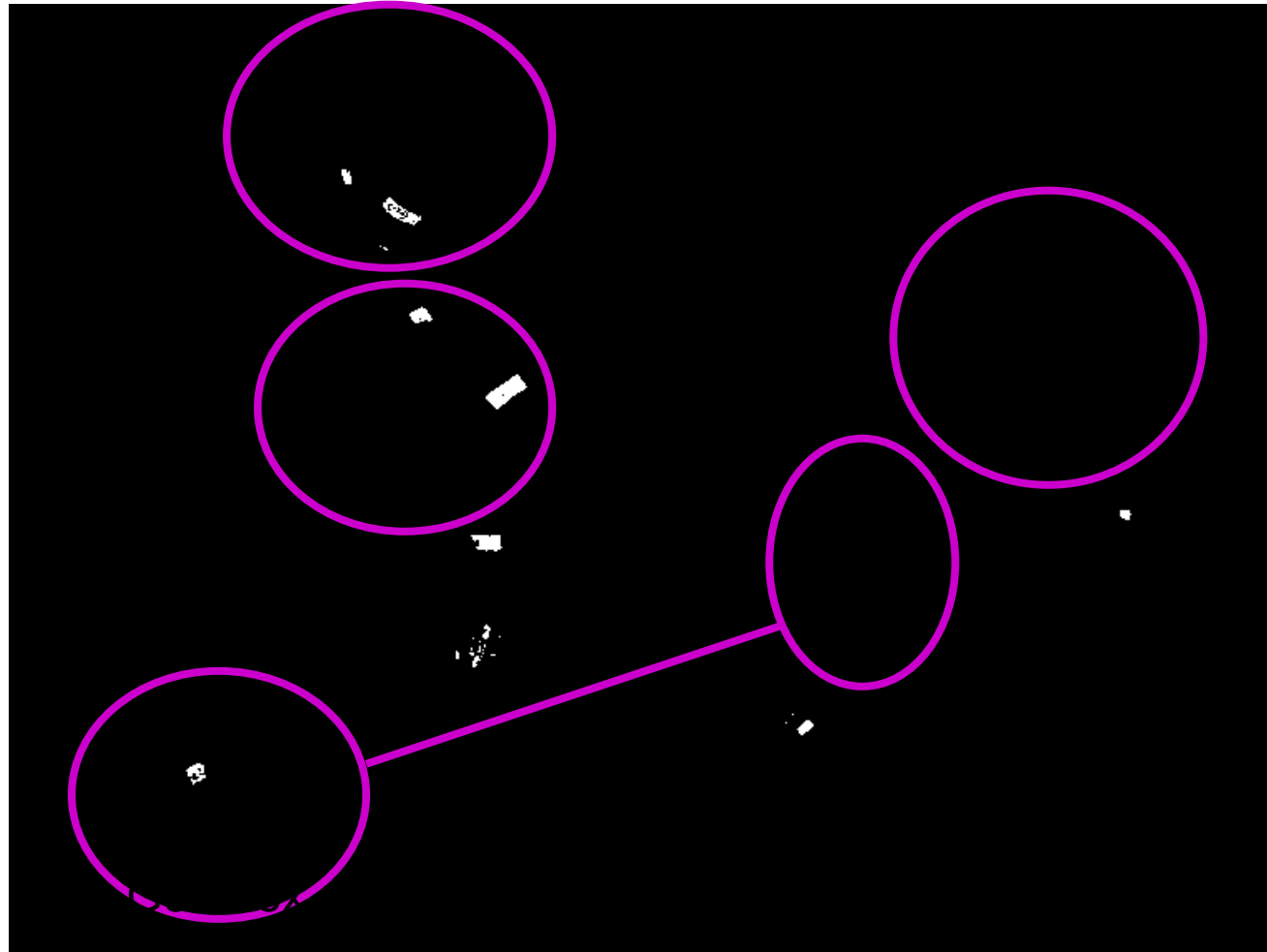


After-run Relay (J155)
Auxiliary position #14
Part = 447 965 571 A
Carrier = 443 937 528
Relay Label = 324



Earth Strap 32
To A-pillar

Ancillary Bundle Overview



Part Number = 895 971 066 B

Ancillary Bundle – T8e & T8f



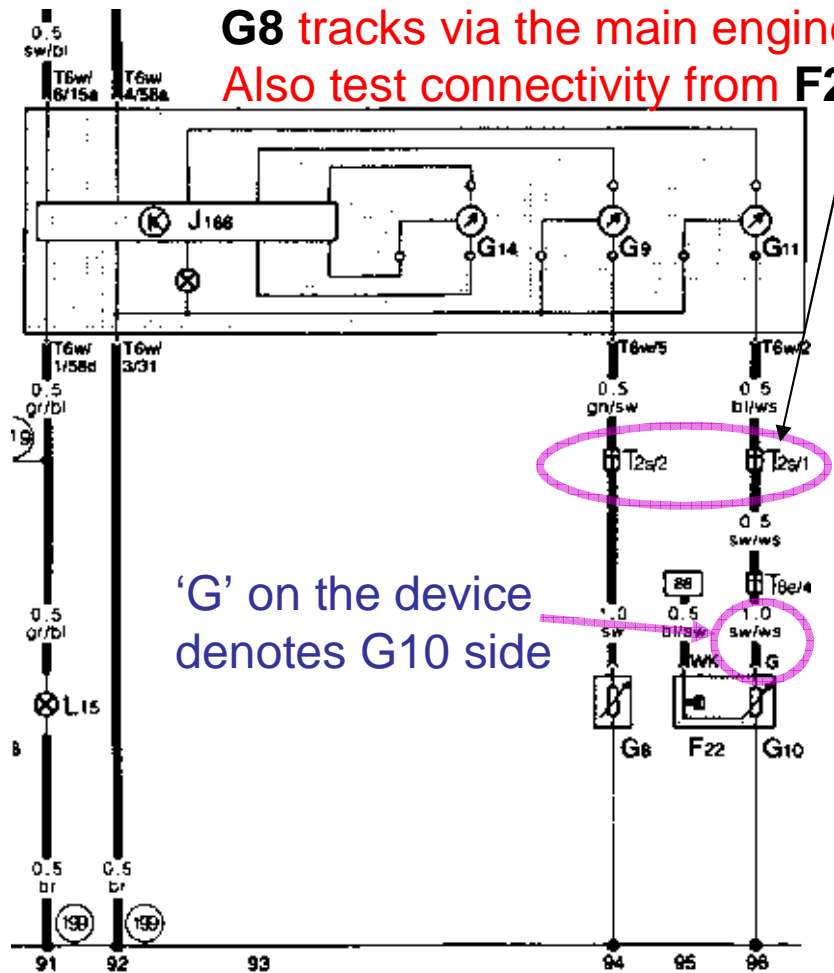
- T8f is marked with a '1' label
- T8e is marked with a '2' label

Purpose of these is to extend ABY loom to various engine bay sensors.

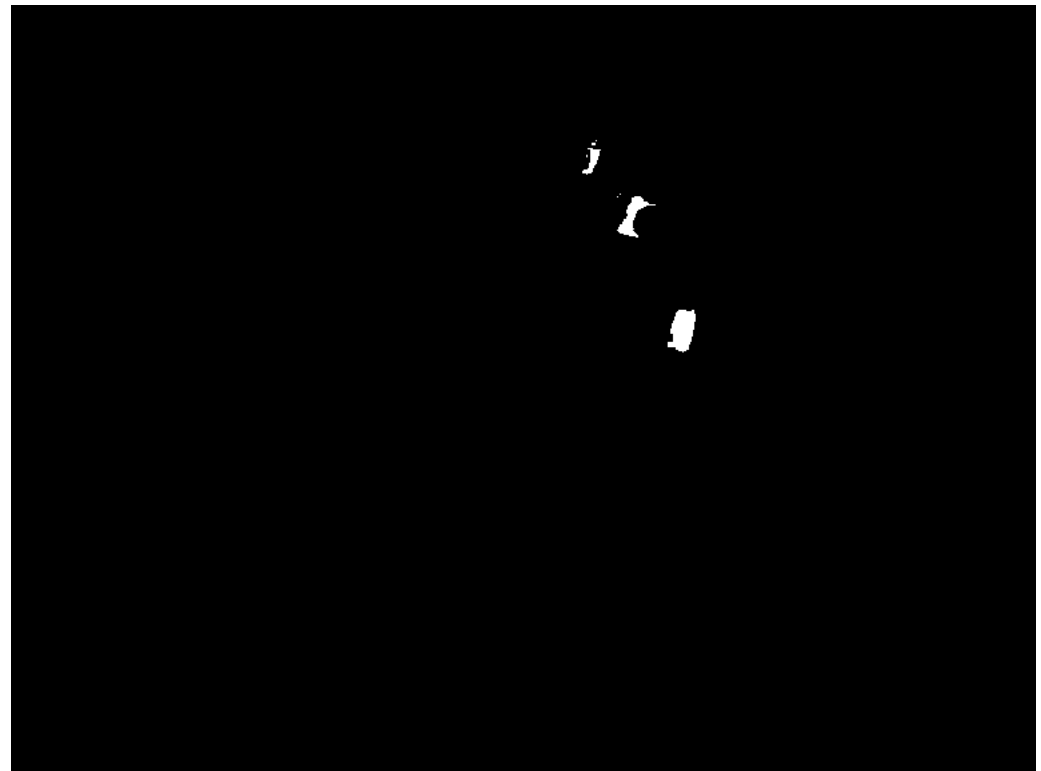
Ancillary Bundle A1 – Oil Senders

TIP - Test connectivity from **G10** via **T2s** in Bundle 3

G8 tracks via the main engine loom in Bundle 2. **F1** connects to **T5** (Bundle 5).
Also test connectivity from **F22** to **T10/3** via **T8f/7** (See track 88 on next page)



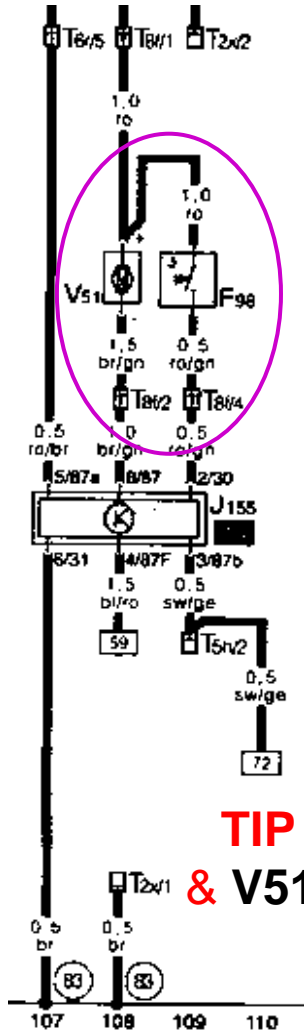
'G' on the device denotes G10 side



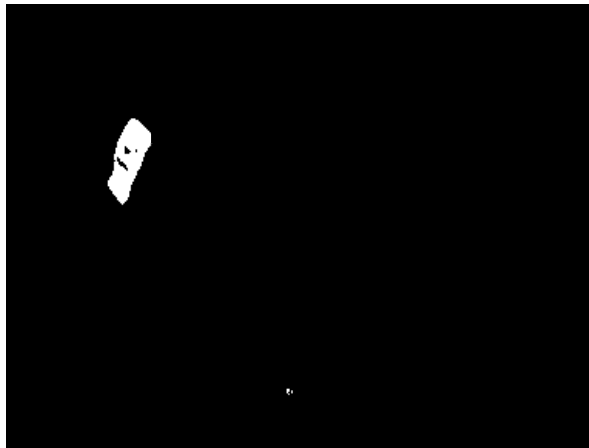
Bundle A1 connects the oil pressure sensor / switches on left side of engine block.

Ancillary Bundle A2 – Water Related

After-run Circuit

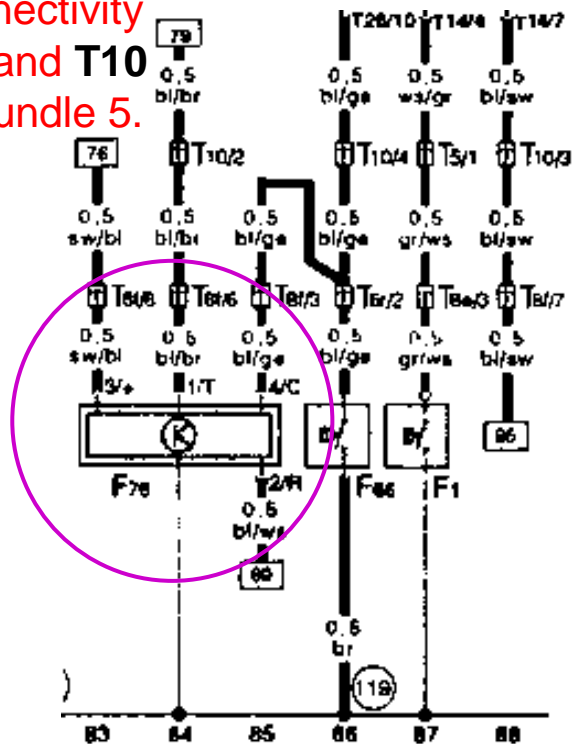


TIP - Test connectivity from F98 & V51 to J155 Relay (Bundle 5) via connectors T5h and T8f

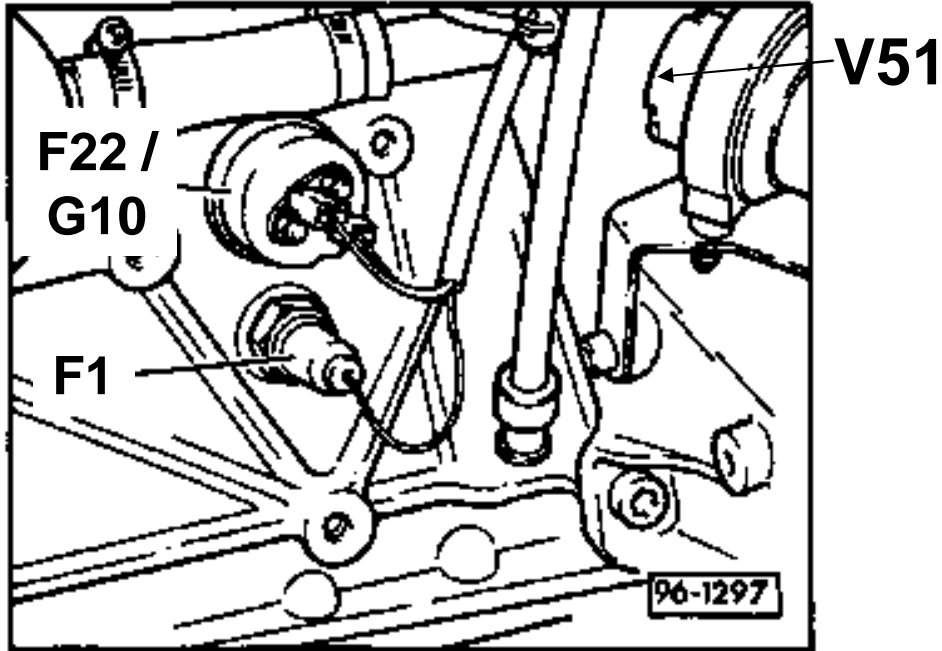


TIP - Test connectivity from F76 to B and T10 via T8f. See Bundle 5.

MFTS



Ancillary Locations – Oil & Water

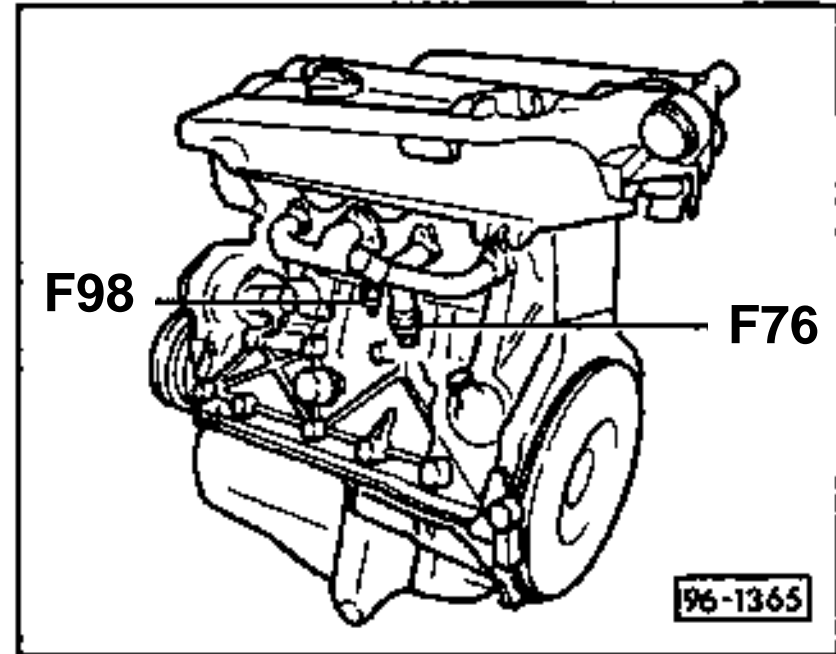


Location – Below water rail.

F22 / G10 combination

- F22 is the BLACK spade (switch)
 - G10 is the BLUE spade (sender)
- Ensure BLUE spade connects to 'G' pin

F1 - 1.8bar oil pressure switch – white hood



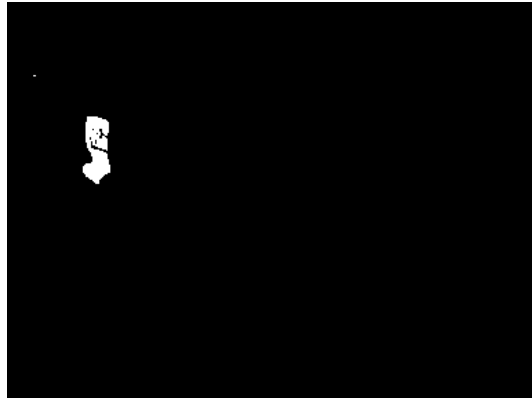
Location – Water rail on left side.

F98 – Thermoswitch for afterrun pump system

F76 = Multi Function Temperature Sensor (MFTS)

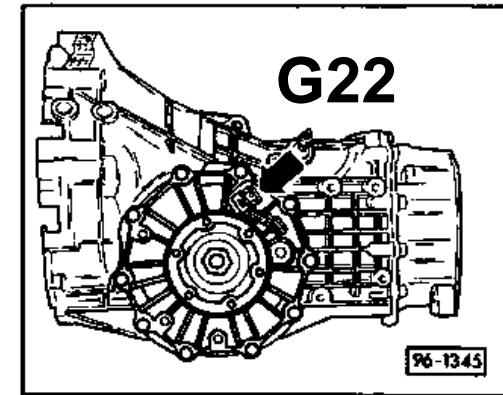
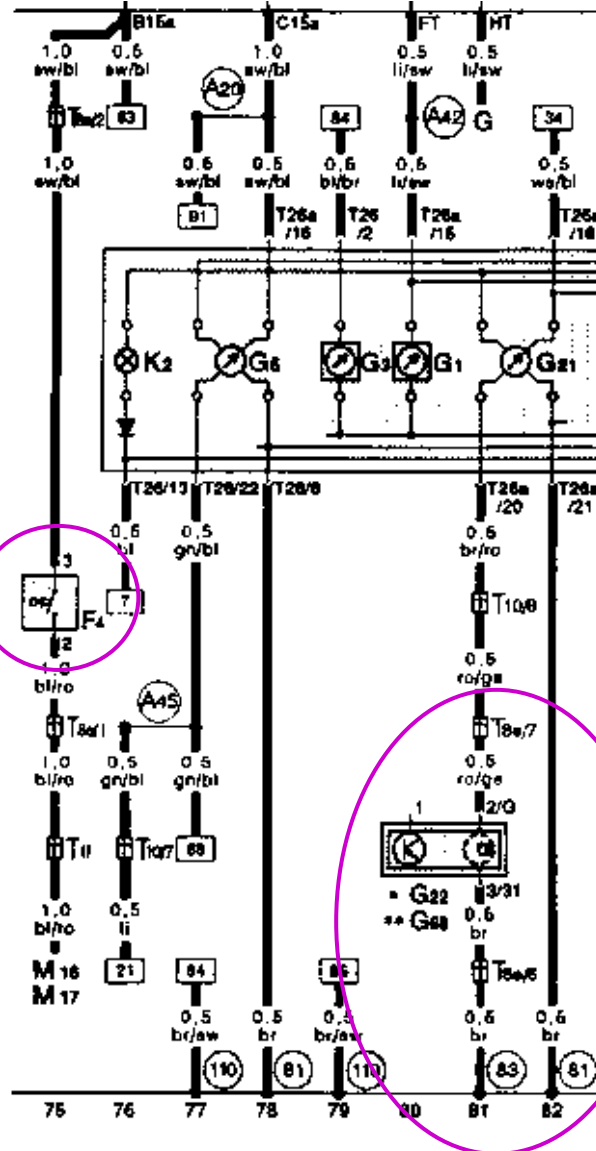
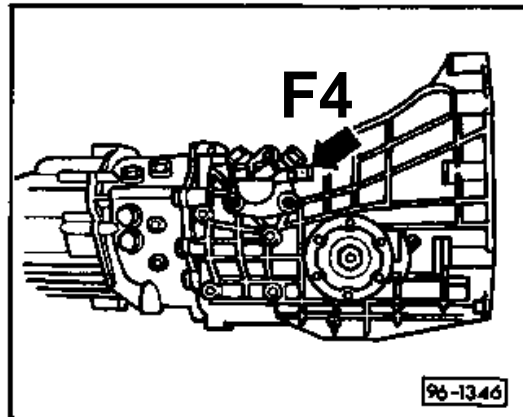
Ancillary Bundle A3 – Gearbox

Reverse Light Switch



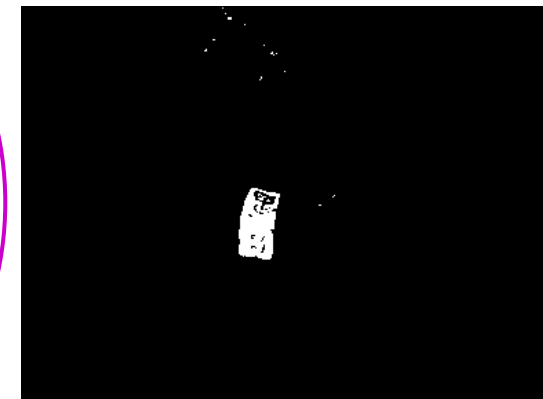
2-pin JPT

TIP - Test connectivity thru F4 between T8e and T1f
See Bundle 5...



TIP - Test connectivity thru G22 between T8e and T10
See Bundle 5...

Speed Sender



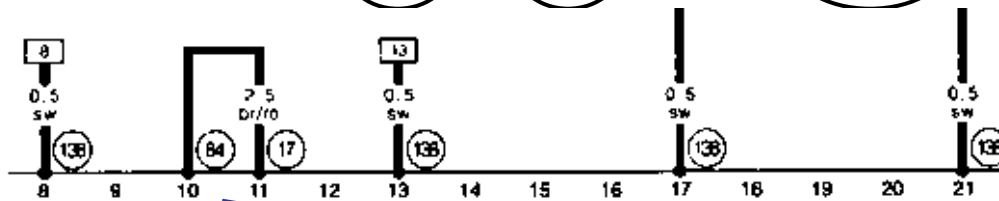
3-pin JPT

A note about loom connectors

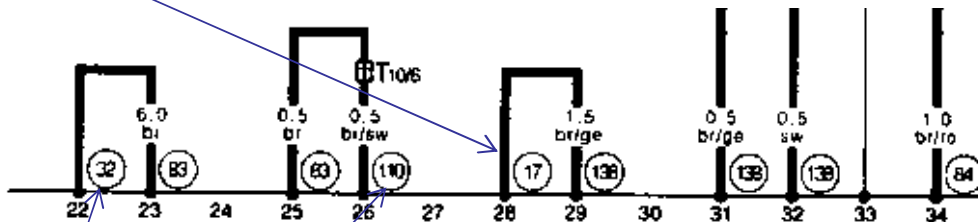
- The vast majority of the multi-pin plugs found on the loom are from the AMP 'junior power timer' family of connectors – *JPT* for short. Even the ECU is JPT-55.
 - 2, 3 & 4-pin JPT connectors and insulation hoods are widely available from aftermarket electrical specialists
 - 6-pin JPT are hardest to find for MAF (**G70**) & TPS (**F60/G69**)
 - 4A0 906 236 is the Audi part number for the female plug
 - 4A0 906 102 is the connector insulation hood
 - Circular connectors **T8e** & **T8f** are also hard to find
 - Female = 443 972 984
 - Male = 443 972 983
 - Hood = 443 906 102 F
 - There's a few other oddball's of course...

Finally – A word about earthing

- There are internal earth points on the ABY loom
 - Shown as 83, 84 and 138 on the schematics



- 17 is the earth point at the inlet manifold



- 32 is the earth point inside on the A-pillar

- 110 is another earth point in the main dash loom



END

**Please send any comments,
questions or corrections to
S2central@mac.com**