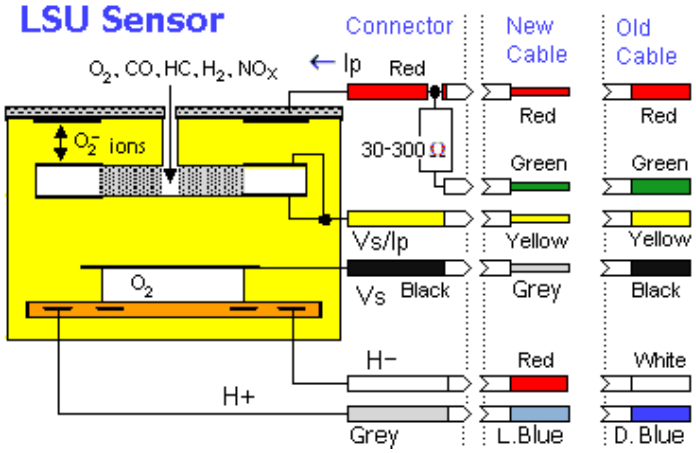
LSU Connectors & Wiring

In mid 2007 *Tech Edge* improved the way it manufactures cables. They should now be more reliable, stronger, and less prone to damage through flexing in the middle and at either end.

We previously used two individual cables with a sheath to hold and protect them both. Now we use a specially manufactured single cable with different sized conductors and the sheath is used to just protect the cable. A complication is that the colours of the cable's internal wires changes slightly between the two systems.

LSU (5 Wire + R_{Cal}) Pinouts

All LSU sensors we have seen, regardless of the connector, use the five lead colours shown in the image below (Red, Yellow, Grey, Black, White). The laser trimmed calibration resistor (**Rcal**) is unique to each sensor and adds a sixth pin to the connector. Each sensor's Rcal (shown as 30-300Ω) has a unique value that only works properly with that sensor. Rcal connects internally to the Pump Current (**Ip**) sensor lead.



LSU wire		LSU Pin Numbers			Cable Colours	
Colour	**Name**	**7057**	**6066**	**17025**	**New**	**Old**
Red	Ip	6	1	1	*Red*	Red
Black	Vs	1	2	6	*Grey*	Black
Yellow	Vs/Ip	5	3	2	*Yellow*	Yellow
White	H-	4	4	3	**RED**	White
Grey	H+	3	5	4	**L.BLUE**	D.Blue
N/A	Rcal	2	6	5	*Green*	Green

New cables use two wire sizes (small in italics, large in bold) and some colours differ from the old cable colours.

LSU Sensor & Harness Connector Pin Numbering

The **sensor-connector** (ie. the connector that comes with the LSU sensor) mates with the **harness-connector**. Tech Edge sells **ONLY** the harness-connector end, **NOT** the sensor end!. In general the sensor end is **NOT** commercially available.

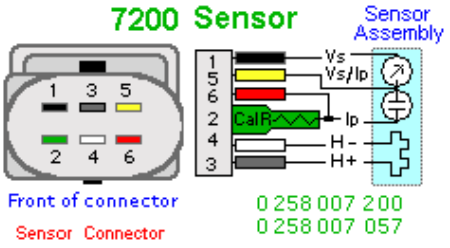
For people making or modifying cables, it's very important that you check the connector numbering scheme which seems to have a different scheme from one connector to the next (compare the 7057 and the 17025 numbering). Tech Edge has used the following LSU sensors with various WBo2 units. Images below show the 6 pin connector (with Rcal) attached to the sensor. Go here for information on LSU connector kits available. Click on the images to get larger images of the sensor connectors.

Click connector images to enlarge

Sensor Connector

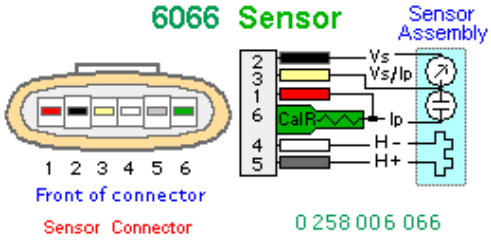
Sensor Pinouts - Viewed from mating (front) face

7200 or **7057** are **LSU 4.2 sensors**.
*Full part number is **0 258 007 7200***.
Sensor connector is shown looking at the mating face. Note that the green pin is from the RCal part inside the sensor connector housing, and thus there's no green wire to the sensor assembly (represent by the blue area to the right).



6066 is an **LSU 4.0 sensor**.
*Bosch number is **0 258 006 066***.

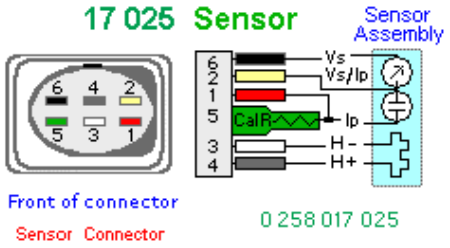
Controllers must be recalibrated if changing between LSU 4.0 and 4.2 sensors.



17025 is an **LSU 4.9 sensor**.
*Bosch number is **0 258 017 025***.

The 4.9 sensor is very different to the 4.0/4.2 and also requires a bias current. Controller jumpers and firmware must be changed between LSU 4.0/4.2 and 4.9 sensors.

Note also that the pin numbering changes but positions remain the same for the 4.2 and 4.9 connectors!



Please refer to the LSU page for information on available LSU sensors that work with WBo2. *Note :* The Terminals and end seals are also available as AMP/Tyco parts but we are unable to provide more information (contact AMP/Tyco direct).

Mating (Harness) Connector

LSU part #

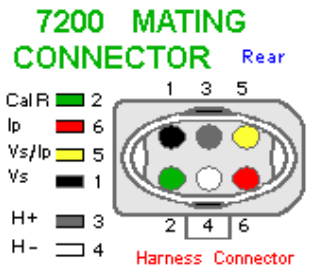
Mating Connector Pinout Viewed from Rear

Mating Sensor 0 258 00**7 200** from *Tech Edge* part # **[07200]**

0 258 00**7 057** From VW.

Tech Edge part # **[CNK7200]**

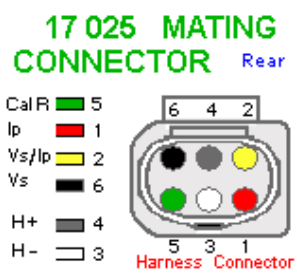
- Shell - VW # 1J0-973-733
- Terminals (with wires) # 000-979-133-A (also from AMP/Tyco)
- End seals (green) # 357-972-741-A (also from AMP/Tyco)



Mating Sensor 0 258 0**17 025** from *Tech Edge* part # **[17025]**

Tech Edge part # **[CNK17025]**

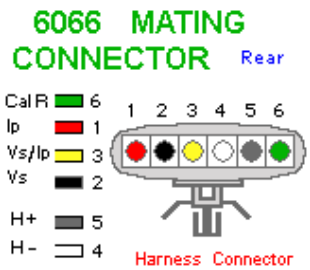
- Shell - Bosch # 1 928 404 692
- Terminals (AMP/Tyco)
- End seals (red or grey AMP/Tyco)



Mating Sensor
0 258 00**6 066**
from *Tech Edge*
part # **[06066]**

Tech Edge part # **[CNK6066]**

- Shell - Bosch # 1 928 404 012
- Terminals (AMP/Tyco)
- End seals (red or grey AMP/Tyco)
- seal retainer clip (black)



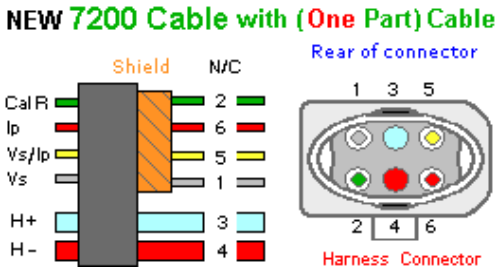
LSU WBo2 Cables (New & Old)

There are currently two Tech Edge cable types in use, the original (two inner cables, shown at left) system that was used from 2002 to 2007.

In 2007 a new improved one part cable was introduced (at right). Latest cables have a boot to cover the inner wires for even greater protection and waterproofing.

This new cable was specially manufactured for us and comes with text *TECH EDGE WIDEBAND* printed on the side.

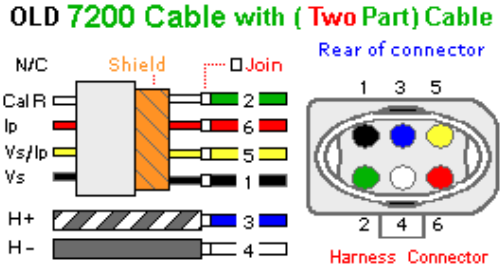
Cable Inner details



New Cables : Our specially manufactured cable (bigger view) is still enclose in the tough outer fibreglass sheath for added protection. A diagram of the internal cable wiring is shown with connection to our most popular sensor the 7200 (same pinout as 7057) - note the shielding braid for the small wires has been collected and twisted together. Unfortunately we could not get our new cable manufactured in the exact same colours we used for the old cable system, so be careful not to confuse the heavy duty red **heater** wire with the small shielded *Ip* wire. Also, in the image at right, the small wire one from bottom is actually **green** (bigger).

Prior to 2007 our controller to sensor cables were constructed of two individual cables -

- a heavy duty figure 8 (ie. two core) heater cable (the covering of one wire has an identifying trace), and
- another cable containing a bundle of 4 individually shielded small wires.
- a fibreglass sheath covers the two cables to give a single cable bundle.



Old Cables : The diagram, and image (bigger view) shows how the cables were connected to our most common sensor - the 7057/7200. We made cables like this for 5 years but, we found that with constant use, the cables tended to develop breaks in the small internal wires where they attached to the larger external wires. This is due to the soldering process making the normally flexible copper wires more brittle. The joins are also where the cable is under the most flexing stress.

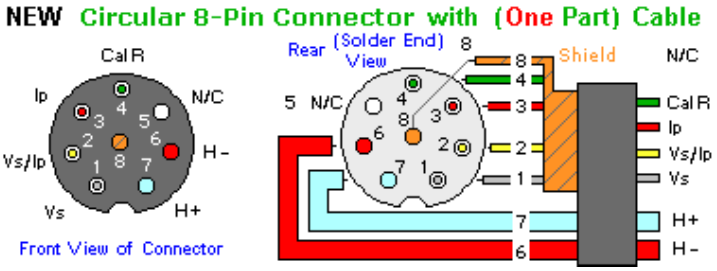
if you are getting strange results (like AFR/Lambda stuck near the stoich point) then our cable debug guide may help diagnose some of the most common wideband faults cause by cable breaks. When we repair old cables we use Araldite® around the wire joins to limit the movement of the brittle solder joints.

The design of both ends of the cable changes with the new cable. The following sections describe the two cable formats.

Circular 8 Pin Connector as Used on Cables

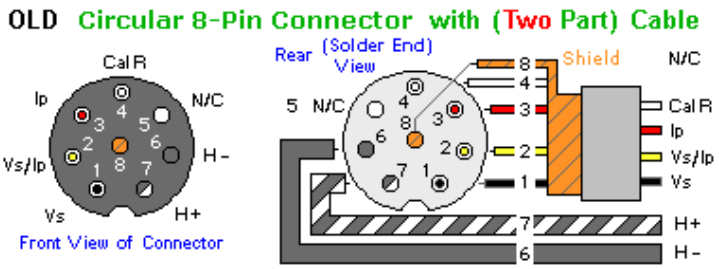
The big advantage of the 8 pin circular connector is that quite often the wideband cable can be routed from outside to inside the vehicle through an existing cable gland. If a new hole is required then the small diameter of the connector end (~ 17 mm) makes this a relatively painless procedure.

New (One Part) Cable : This diagram shows both the front of the circular 8-pin connector as seen by someone looking at the end of the completed cable, and also the wire or solder-side end of the connector that will be seen during construction or repair. Note that the shield (braid) is connected to the centre (pin 8), but at the sensor end of the cable, the braid is left unconnected - thus the braid acts as a Faraday Cage to shield the small signal wires from pickup from both external noise and switching noise from the H+/H- wires that are in close proximity. Note also that on the circular connector Pin **5** is spare (N/C).



Along with recent cable changes, we have also changed our connector supplier and there are now a couple of small variants in the circular 8-pin connector used in our cables. In general this will not be an issue unless you come to repair your cable.

Old (Original Two Part) Cable : This diagram shows the corresponding two part (older or original design) cable. All the signal wires are carried in a cable with four individually shielded small wires. The Heater current is carried in a separate heavy duty figure-8 cable that goes to pins **6** & **7** Note : the heater wire with tracer colour goes to pin **7**.

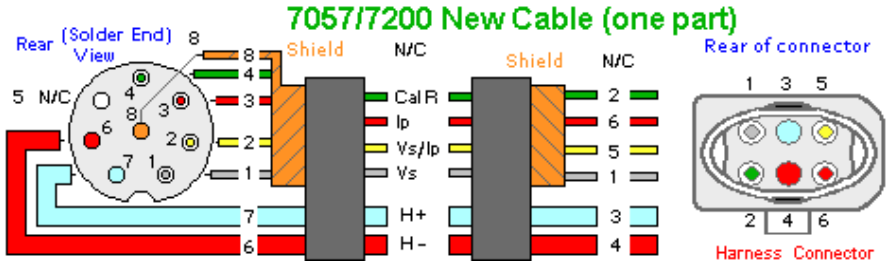


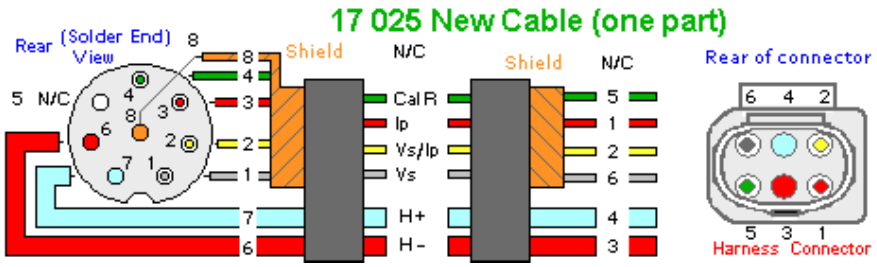
The sensor end of the cable is attached to the mating or harness connector. These connectors are described above. The following section describes all cables we have manufactured, including old and new styles, for the 7057/7200, 6066 and 17025 sensors.

New One-Part Cable Design

7200/7057 (LSU 4.2) "New" Cable

Note that the shield is an integral part of the design and should ONLY be connected at the 8 pin (controller) end to GND. Click to enlarge the image.



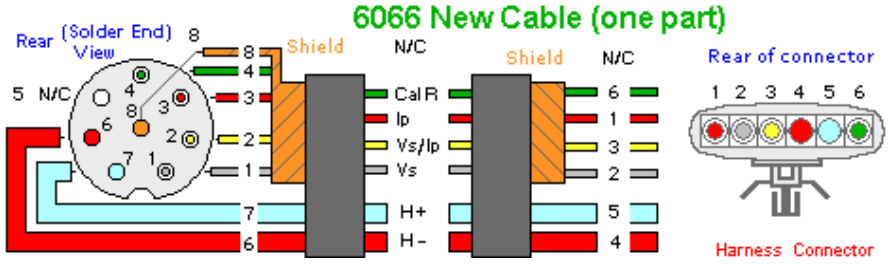


17 025 (LSU 4.9) "New" Cable

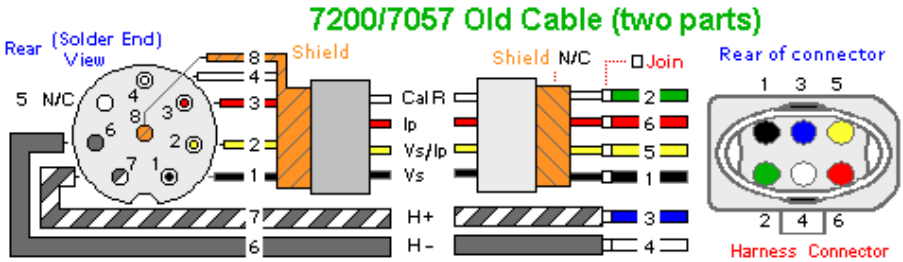
The **17 025** connector is similar (but smaller) to the 7057/7200 (they have the same wire colour layout), but the connectors are numbered differently (refer to the table). Click to enlarge the image.

6066 (LSU 4.0) "New" Cable

The **internal wiring** in the 6066 cable is shown as well as the coloured **end wires** going to the harness connector and the **LSU sensor wires** too. (Click to enlarge it).



Old Two-Part Cable Design

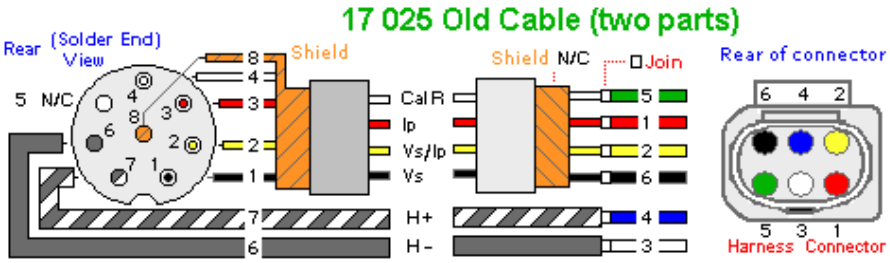


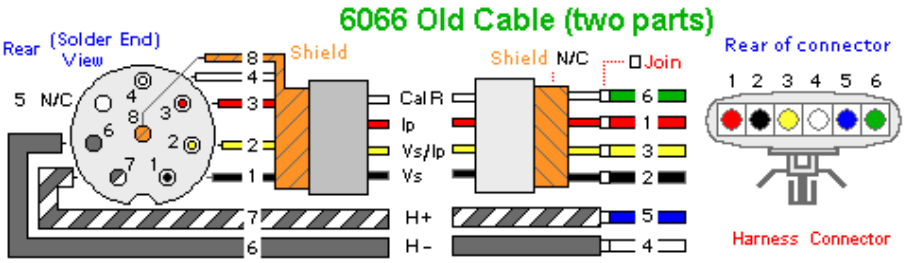
7200/7057 (LSU 4.2) "Old" Cable

The **7 057** & **7200** cables are similar. Click to enlarge the image.

17 025 (LSU 4.9) "Old" Cable

The **17 025** cable is similar to the 7057/7200 (they look the same from the back of the connector), The connectors have different pin numbering (refer to table). Click to enlarge the image.





6066 (LSU 4.0) "Old" Cable

The 6066 is the oldest of the sensors on this page. (Click to enlarge it).

More ...

Go here for more info on LSU sensors, here for connector kits sold, and here for DIY cable construction.

Page updated 14 Jul '10 (formatting)

Page created 29 April '03 (from LSU Main) | *Tell me about broken links*