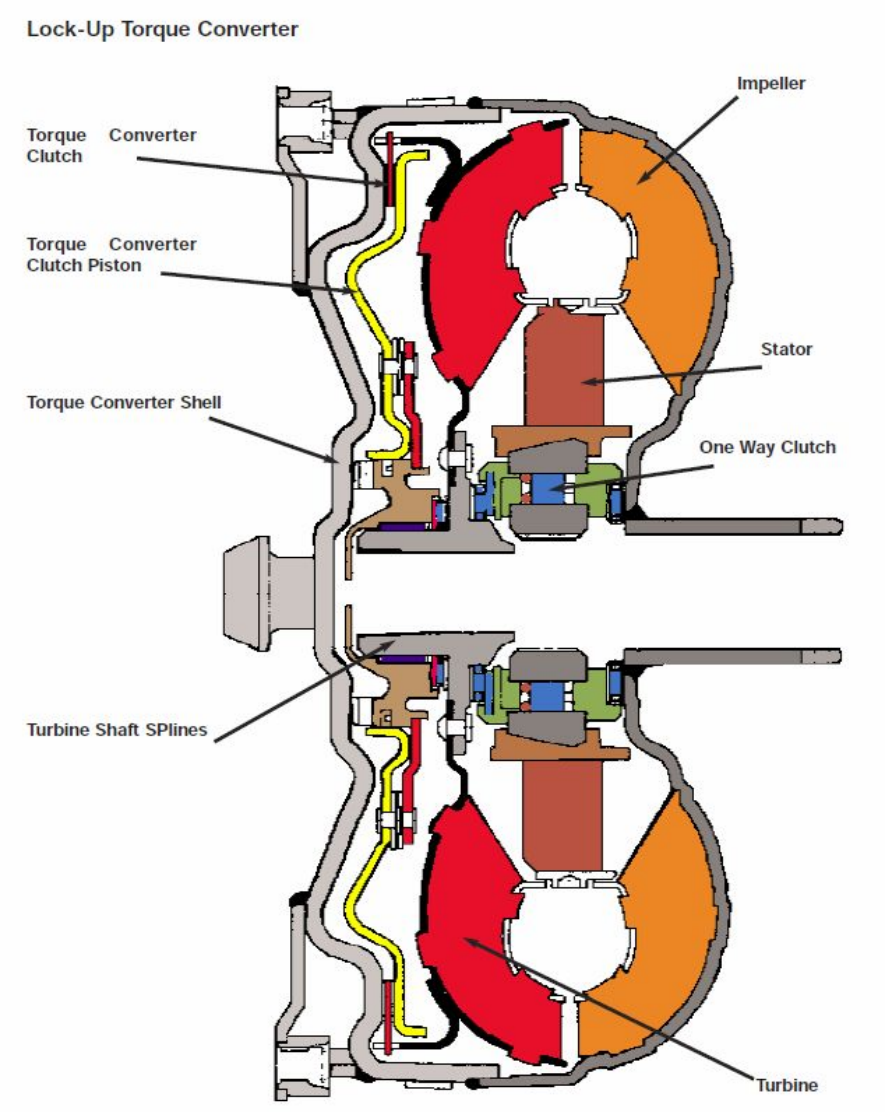
TCC Controller

automatic transmission ZF model 4HP24

General information

The 4HP24 automatic transmission has a built in lock up clutch for the torque converter which eliminates the slip once engaged. The factory design is that it works only in 4th gear and above roughly 100km/h. This means, in all driving situations where this speed is not reached like city and highway driving the torque converter is wasting expensive energy all the time due to the slippage.
The extra control unit takes over the control of the TCC (**T**orque **C**onvert **C**lutch) and engages it already at the much lower speed of 40km/h. It also engages the TCC gradually and not with a "kick" like the factory EGS does it. This guarantees a much smoother operation and of course puts much less stress on all mechanical components.
Once the speed decreases below 40km/h the TCC will open immediately.



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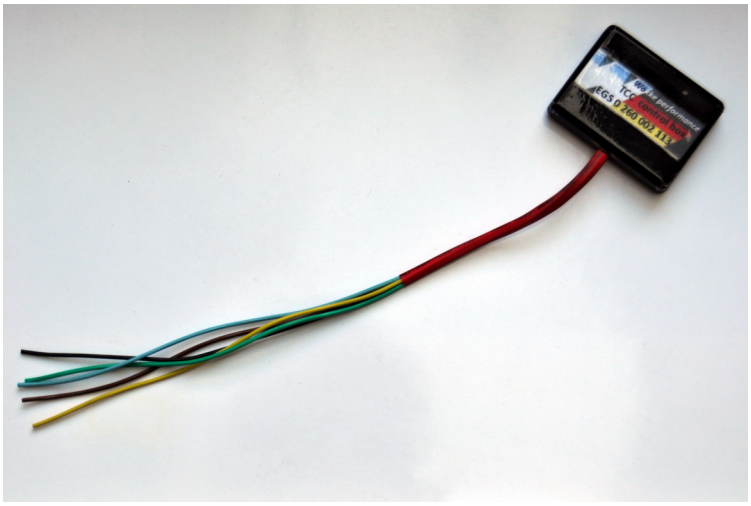
Installation of the internal TCC control box



REQUIRED TOOLS:

- Small ratchet with an extension and a 10mm socket
- Screwdriver medium size
- Soldering iron

The TCC controller needs five electrical connections:

1.	12V	blue wire	TCC control box cable,	PIN 35 EGS main connector
2.	12V	green wire	TCC control box cable,	PIN 35 EGS main connector
3.	Ground	brown wire	TCC control box cable,	PIN 05 EGS main connector
4.	Drive shaft speed	yellow wire	TCC control box cable,	PIN 08 EGS main connector
5.	TCC-EGS output	black wire	TCC control box cable,	PIN 25 EGS main connector

First Step
Locate the EGS (**E**lektronische **G**etriebe **S**teuerung = Automatic Transmission ECU) on the inner right rear wheel arche inside the trunk.

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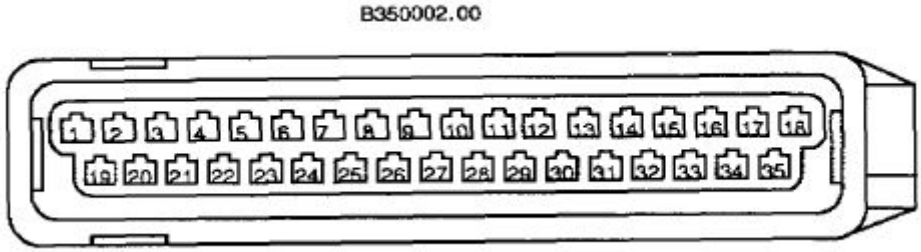
Second Step
Unscrew the 10mm nuts which hold the EGS in place and the single 10mm nut connecting the ground wire to the chassis.

Third Step
Disconnect the EGS from the main connector (X8500) by flipping the silver handle upwards and then removing the connector from the EGS. Take out the EGS.

Forth Step
Open the EGS. Using a screwdriver the metal latches can be bent and the cover removed. You can now see the PCB side of the X8500 connector as well as the numbers on the individual connectors.



This drawing shows the connector side of X8500 which goes on to the EGS unit.
The cables are on the opposite side.

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Fifth Step
Connect the TCC control box wires with the X8500 connector according to the below table.

1.	12V	blue wire	TCC control box cable,	PIN 35 on X8500
2.	12V	green wire	TCC control box cable,	PIN 35 on X8500
3.	Ground	brown wire	TCC control box cable,	PIN 05 on X8500
4.	Drive shaft speed	yellow wire	TCC control box cable,	PIN 08 on X8500
5.	TCC-EGS output	black wire	TCC control box cable,	PIN 25 on X8500

All wires can be soldered directly to the X8500 pins with a very fine soldering iron tip.

Last Step
Close the EGS and reconnect it. After that just enjoy your increased gas mileage.

Options
If you want to make the TCC control box switchable run the brown wire (ground) via a on/off switch.
For an optical control an LED (not a normal 12V lamp!!!) can be connected parallel to PIN 35 (+12V) and PIN 25 (ground if TCC is in operation. This of course requires, that you run a 4 wire cable out of the EGS to your car's interior.
Below pictures show as a sample the setup in my own 850.

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