

2-1 Harsh Downshift Notes and Diagrams

Vehicle Information

Year-Month	Engine	Trans
2006	3GR-FSE	A760E

Wiring diagram details at:

https://www.toyota-tech.eu/td/td3ewd/pgm/standaloneEWD.html?pubNo=EM03A3E_v2;ewd_type=intro;ewd=INTRO01;term=200809;vwlang=en;ewdpath=/td3ewd

Lexus TSB details at:

<https://static.nhtsa.gov/odi/tsbs/2012/SB-10061736-2273.pdf>

TSB number L-SB-0126-12

Function

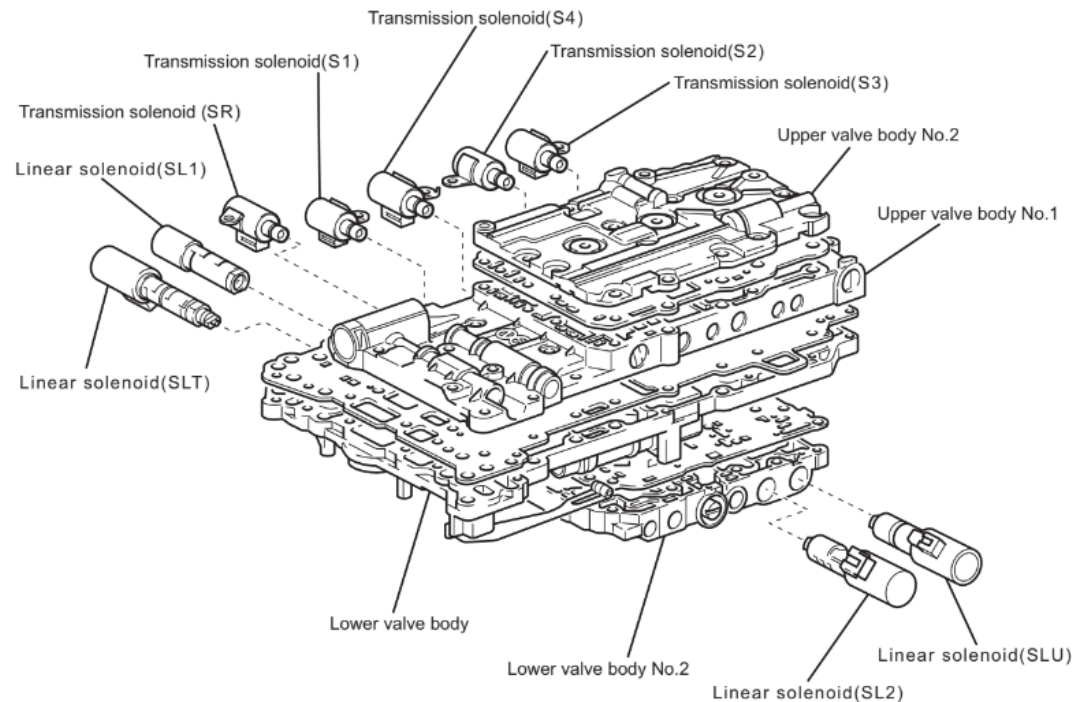
Linear Solenoid Valve	Function
Solenoid valve No. 1 (SL1) for controlling fluid pressure for clutch engagement	·Accumulator back pressure control ·Clutch pressure control
Solenoid valve (SLU) for controlling lockup clutch	·Lockup clutch pressure control ·Flex lockup pressure control
Solenoid valve (SLT) for line fluid pressure control	·Line pressure control ·Accumulator back pressure control
Solenoid valve No. 2 (SL2) for controlling fluid pressure for brake engagement	·Brake pressure control

Transmission Solenoid Valve

- Transmission solenoid valves S1, S2, S3, and S4 are provided for switching the gears, and transmission solenoid valve SR is provided for switching the orifices.
- Each transmission solenoid valve is a three-way solenoid valve that is more compact and lightweight than the previous type. They provide superior response even at low fluid temperatures.
- A strainer is provided at the end of each solenoid valve to realize superior reliability.

Function

Transmission solenoid valves	Type	Function
Transmission solenoid valves (S1)	3-way	·Switches the 1-2 shift valve ·Switches the SL1 relay valve
Transmission solenoid valves (S2)	3-way	·Switches the 2-3 shift valve ·Switches the 5-6 shift valve
Transmission solenoid valves (S3)	3-way	·Switches the 3-4 shift valve
Transmission solenoid valves (S4)	3-way	·Switches the 4-5 shift valve
Transmission solenoid valves (SR)	3-way	·Switches the C4 relay valve ·Switches the B1 relay valve



Transmission Power Flow

SLT

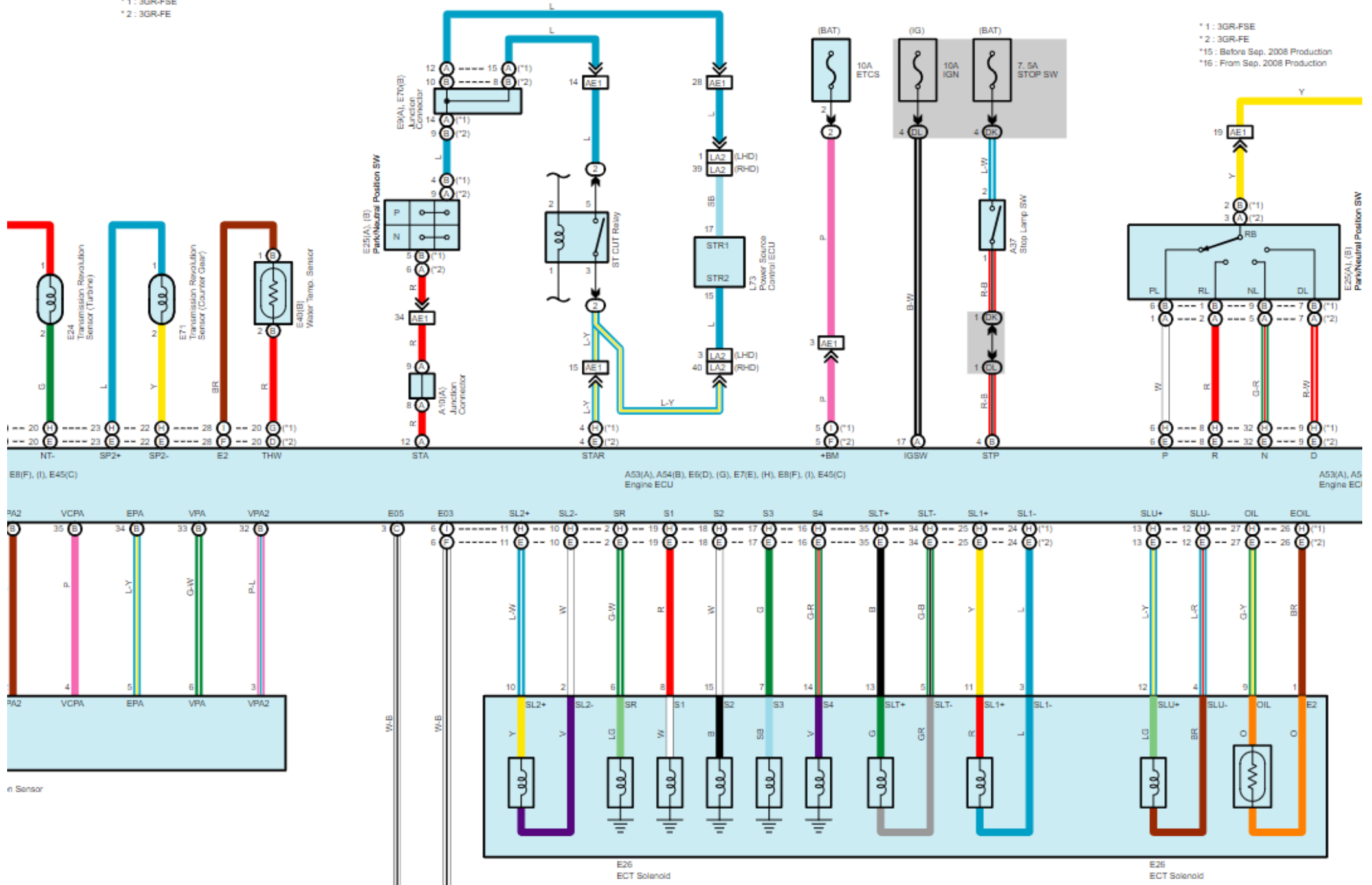
Shift Position or Shift Range	Shift Solenoid Valve								Clutch					Brake				1-way Clutch				
	S1	S2	S3	S4	SR	SL1	SL2	SLU	C ₁	C ₂	C ₃	C ₄	B ₁	B ₂	B ₃	B ₄	F ₁	F ₂	F ₃	F ₄		
P		On	On		On		On															
R*		On	On		On		On				○		△			○	○					
N		On	On		On		On															
D, S6	1st		On	On	On		On		○										○	○		
	2nd	On	On	On	On		On	On	○						○		○	○			○	
	3rd	On		On		On		On	○		○				●		○				○	
	4th*	On				On		On	○	○	●	△			●						○	
	5th*	On			On		On		○	○	○		○		●							
	6th*	On	On		On		On		○	○			●	○	●							

Problem shifts 2 -> 1

Check PCB circuits on these solenoids

System Circuit TRANSMISSION ECT and A/T Indicator (3GR-FSE, 3GR-FE) (From Jul. 2006 Production)

* 1 : 3GR-FSE
 * 2 : 3GR-FE



* 1 : 3GR-FSE
 * 2 : 3GR-FE
 * 15 : Before Sep. 2008 Production
 * 16 : From Sep. 2008 Production

Wiring Harness Connector “H” at ECM

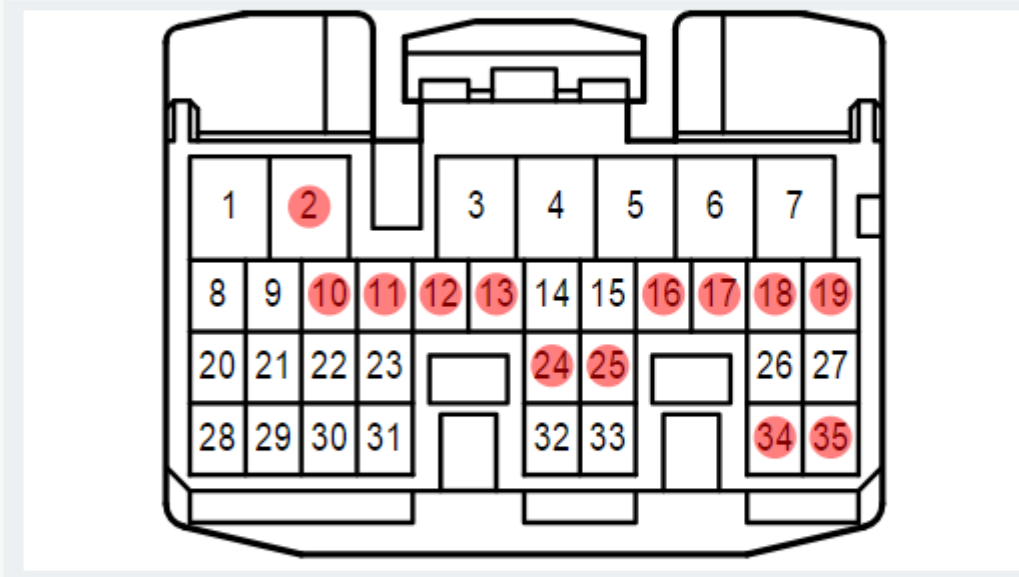
For 3GR-FSE only

[+] Connector List Engine Compartment Engine Wire

Name	Engine ECU
Code	E7(H)
Part Number	90980-12528
Color	White
Spec	From Jul. 2006 Production, Before Jul. 2006 Production 3GR-FSE

[+] Wire Harness Repair

- All terminals
 - Select terminal
- show



Pin	Function	Purpose	Wire Color
19	S1	1-2 shift, SL Relay	Red
18	S2	2-3, 5-6 shift	White
17	S3	3-4 shift	Green
16	S4	4-5 shift	Green-Red
2	SR	C4 relay, B1 relay	Green-White
35	SLT +	Line fluid pressure	Black
34	SLT -	GND	Green-Black
25	SL1 +	Clutch fluid pressure	Yellow
24	SL1 -	GND	Lt. Blue
11	SL2 +	Brake pressure control	Lt. Blue-White
10	SL2 -	GND	White
13	SLU +	Lock-up clutch	Lt. Blue-Yellow
12	SLU -	GND	Lt. Blue-Red
27	Oil +	Oil sensor	Brown
26	Oil -		Green-Yellow

Line Pressure: The pressure from the hydraulic pump that provides the force needed to operate the clutches, valves, and bands.

Low line pressure = sluggish or delayed gear changes, harsh or jerky gear changes.

High line pressure = overly firm gear changes, improper timing.

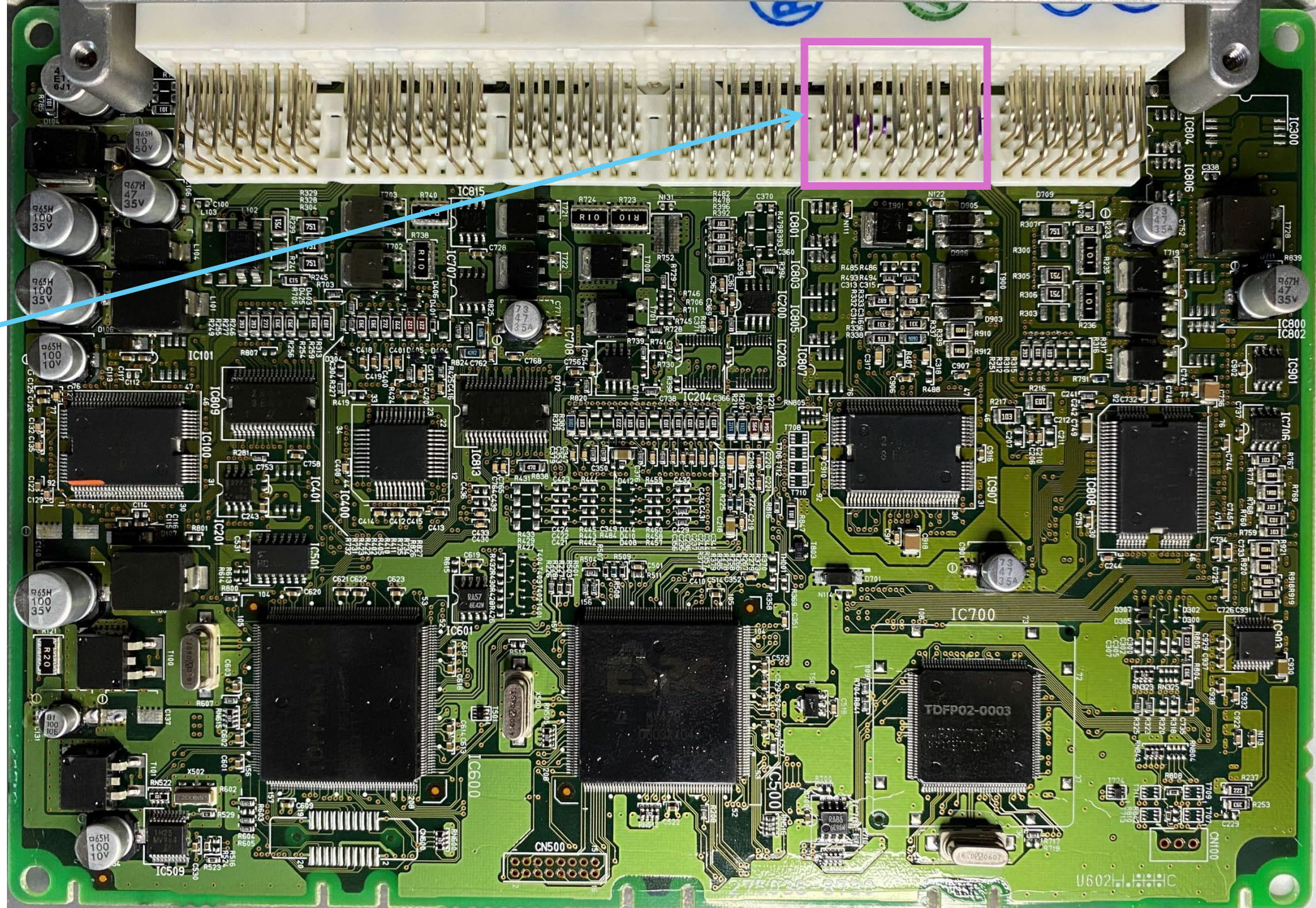
Brake Pressure: Adjusts the pressure of the brake clutches

Clutch Pressure: Allows the shift solenoids, lock-up clutch solenoids, and line pressure solenoids to control clutch pressure while driving. Uses input, intermediate, and output speed sensors to adjust pressure.

- Location
- [Engine Compartment Position of Parts \(LHD 3GR-FE Before Jul. 2006 Production\)](#)
 - [Engine Compartment Position of Parts \(LHD 3GR-FE From Jul. 2006 Production\)](#)
 - [Engine Compartment Position of Parts \(LHD 3GR-FSE Before Jul. 2006 Production\)](#)
 - [Engine Compartment Position of Parts \(LHD 3GR-FSE From Jul. 2006 Production\)](#)
 - [Engine Compartment Position of Parts \(RHD 3GR-FE Before Jul. 2006 Production\)](#)
 - [Engine Compartment Position of Parts \(RHD 3GR-FE From Jul. 2006 Production\)](#)
 - [Engine Compartment Position of Parts \(RHD 3GR-FSE Before Jul. 2006 Production\)](#)
 - [Engine Compartment Position of Parts \(RHD 3GR-FSE From Jul. 2006 Production\)](#)
 - [Engine Compartment Position of Parts \(RHD 3UZ-FE Before Jul. 2006 Production\)](#)
 - [Engine Compartment Position of Parts \(RHD 3UZ-FE From Jul. 2006 Production\)](#)

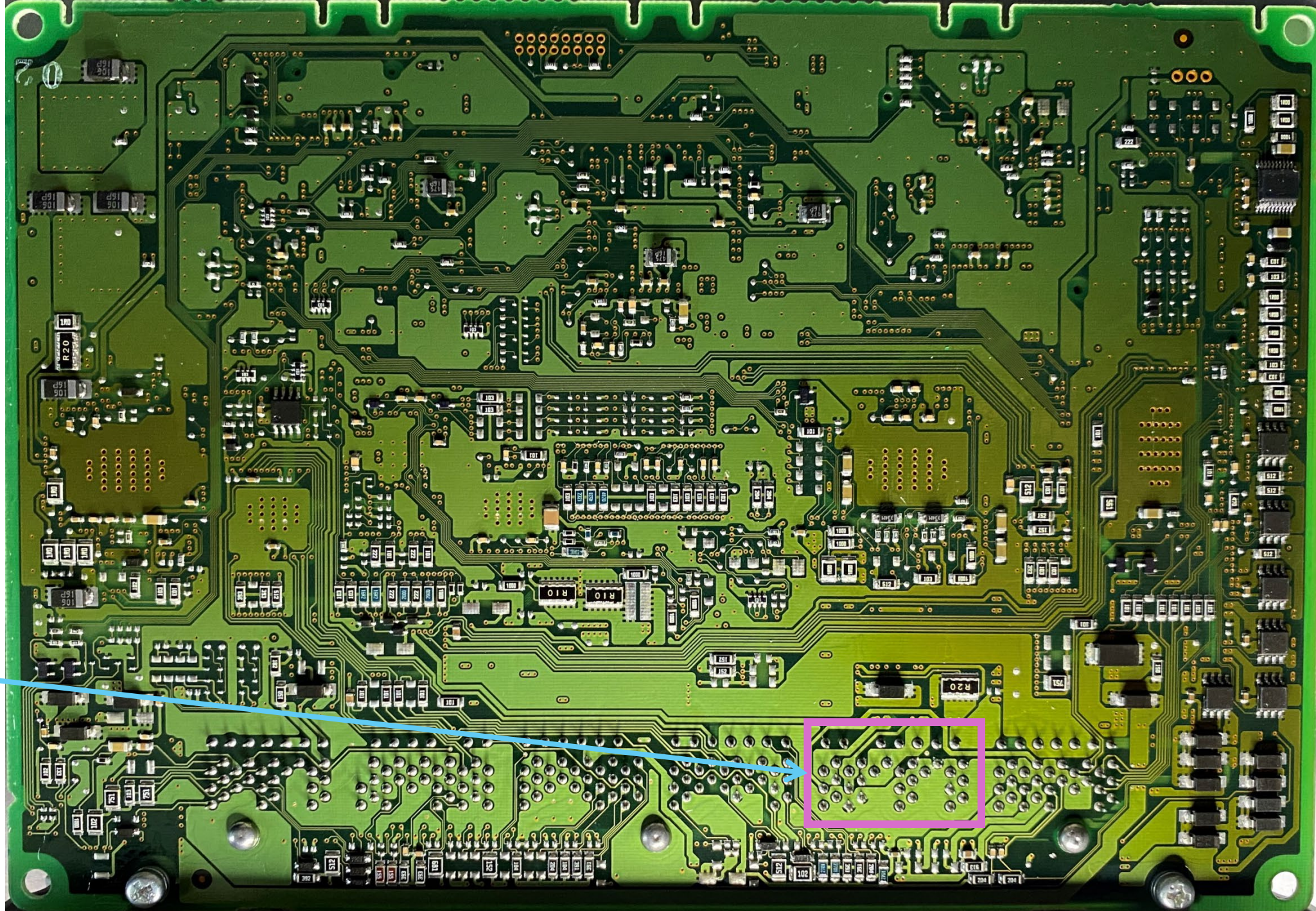
**Top side (labeled side)
of ECM PCB
For 3GR-FSE**

*ECT – electronically
controlled transmission
wiring harness
header
pins*

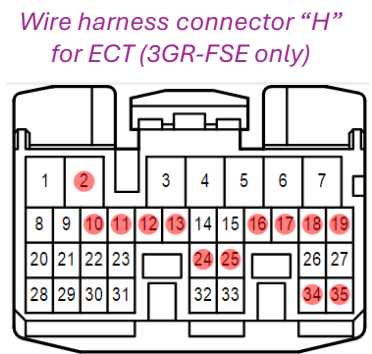
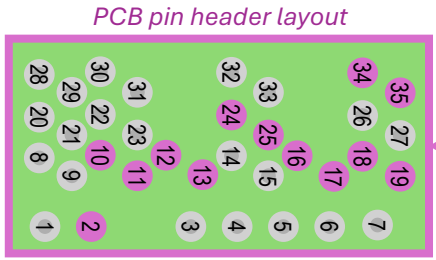


Under side (non-labeled side) of ECM PCB
For 3GR-FSE

ECT – electronically controlled transmission wiring harness through-board header pins



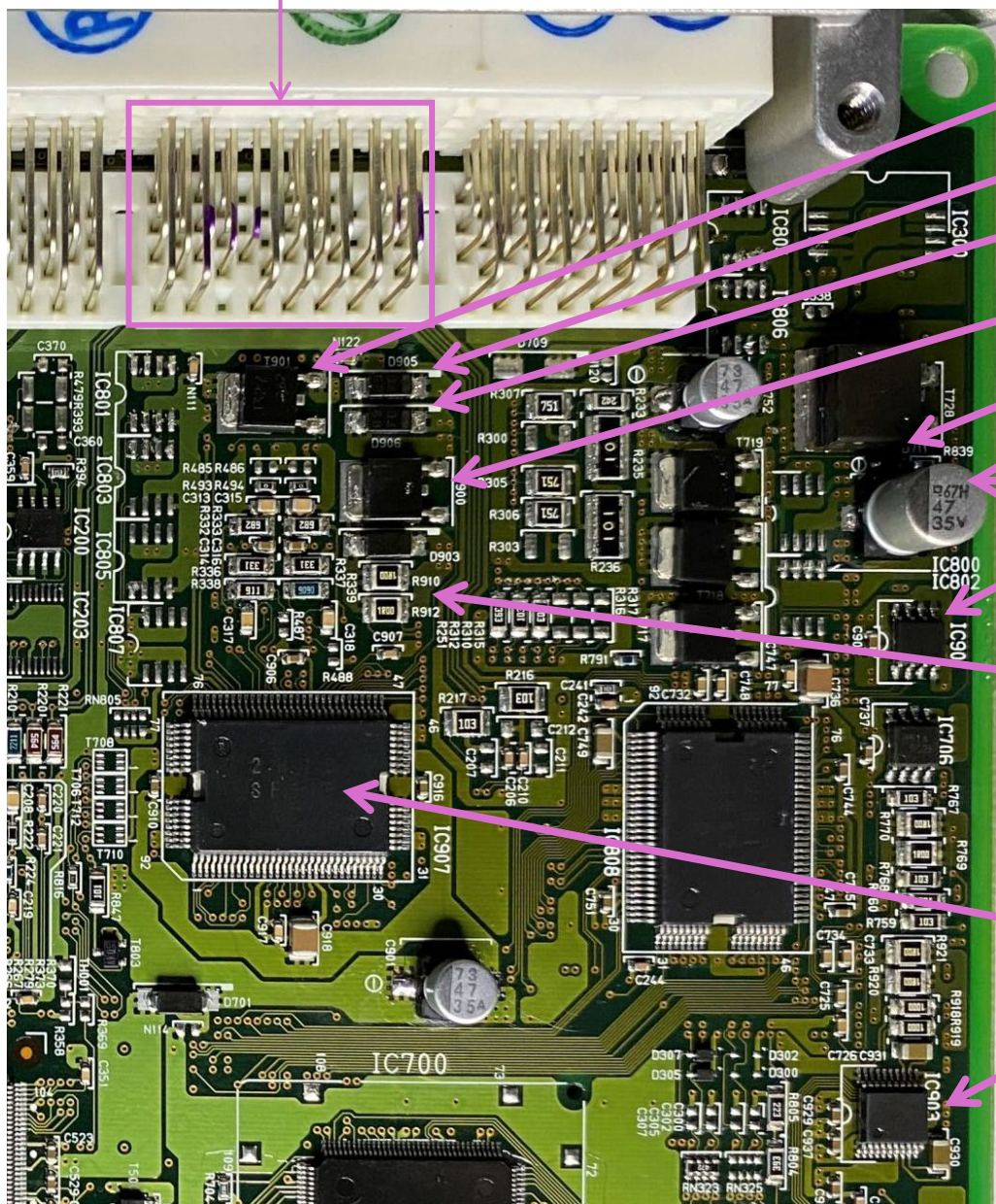
Top side (labeled side) of ECM PCB For 3GR-FSE



Pin	Function	Purpose
19	S1	1-2 shift, SL Relay
18	S2	2-3, 5-6 shift
17	S3	3-4 shift
16	S4	4-5 shift
2	SR	C4 relay, B1 relay
35	SLT +	Line fluid pressure
34	SLT -	GND
25	SL1 +	Clutch fluid pressure
24	SL1 -	GND
11	SL2 +	Brake pressure control
10	SL2 -	GND
13	SLU +	Lock-up clutch
12	SLU -	GND
27	Oil +	Oil sensor
26	Oil -	GND

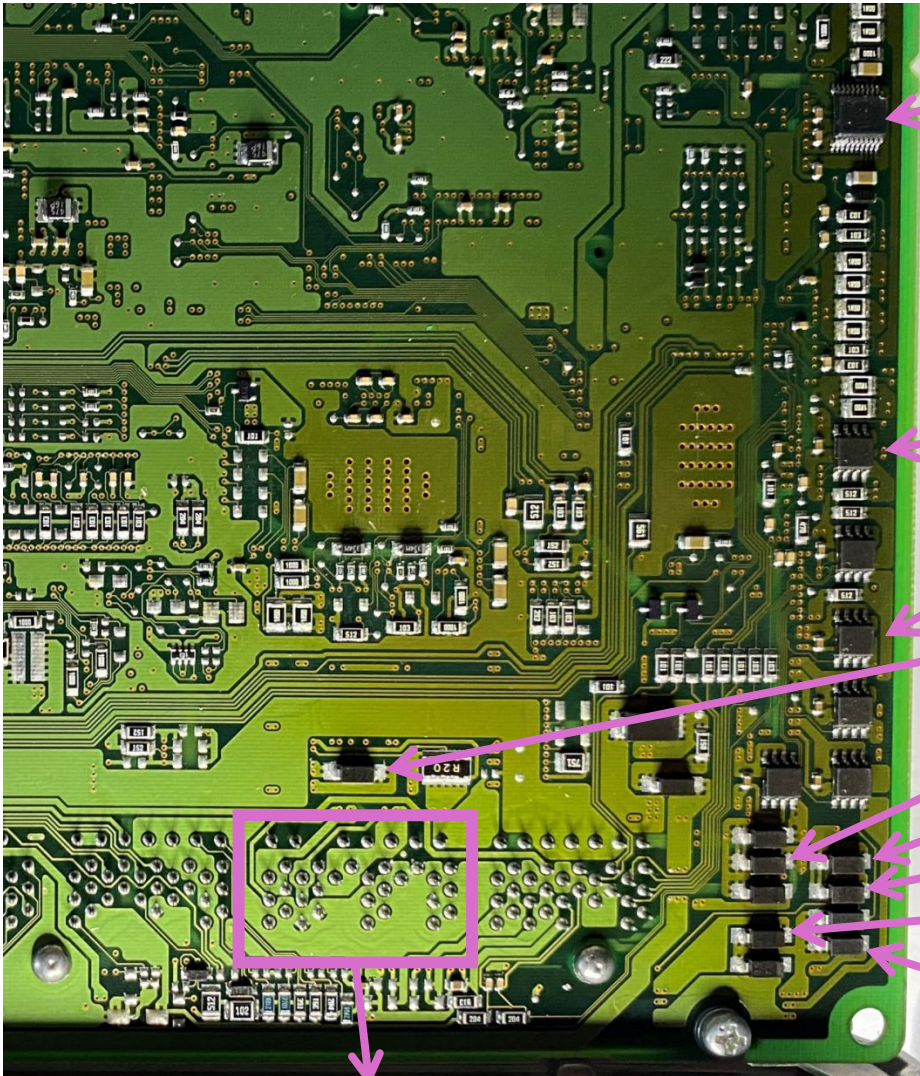
ECT – electronically controlled transmission wiring harness header pins

"FBD" = fly-back diode, for all inductive devices and solenoids.

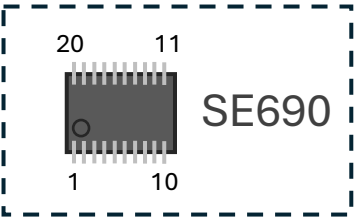


- T901 – P-channel MOSFET, driving SLU+
- D905 – FBD for S1
- D906 – FBD for S2
- T900 – N-channel MOSFET, driving SLT+
- D711 – diode was found loose during inspection
- C724 – Capacitor, 47uf 35v, driving power for solenoids
- IC901, 851A pin 4 – driving S4
- R910 and R912 - 1Ω for current-sensing of SLT
- IC907 – Denso proprietary driver, outputs to S1, S2, gate of T900, gate of T901, outputs to all 851A IC's
- IC903, pin 20 – Denso SE690, driving SL2

Under side (non-labeled side) of ECM PCB
For 3GR-FSE

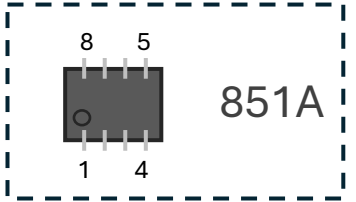


IC, Denso SE690 pin 20 - driving SL1



IC, 851A pin 4 - driving S3

IC, 851A pin 4 - driving SR



Diode - FBD for SLU

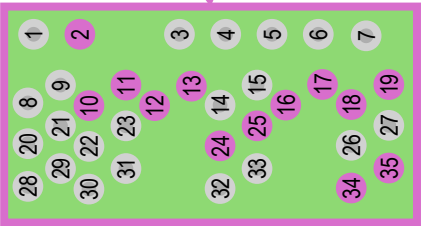
Diode - FBD for S3

Diode - FBD for SL1

Diode - FBD for S4

Diode - FBD for SR

Diode - FBD for SL2

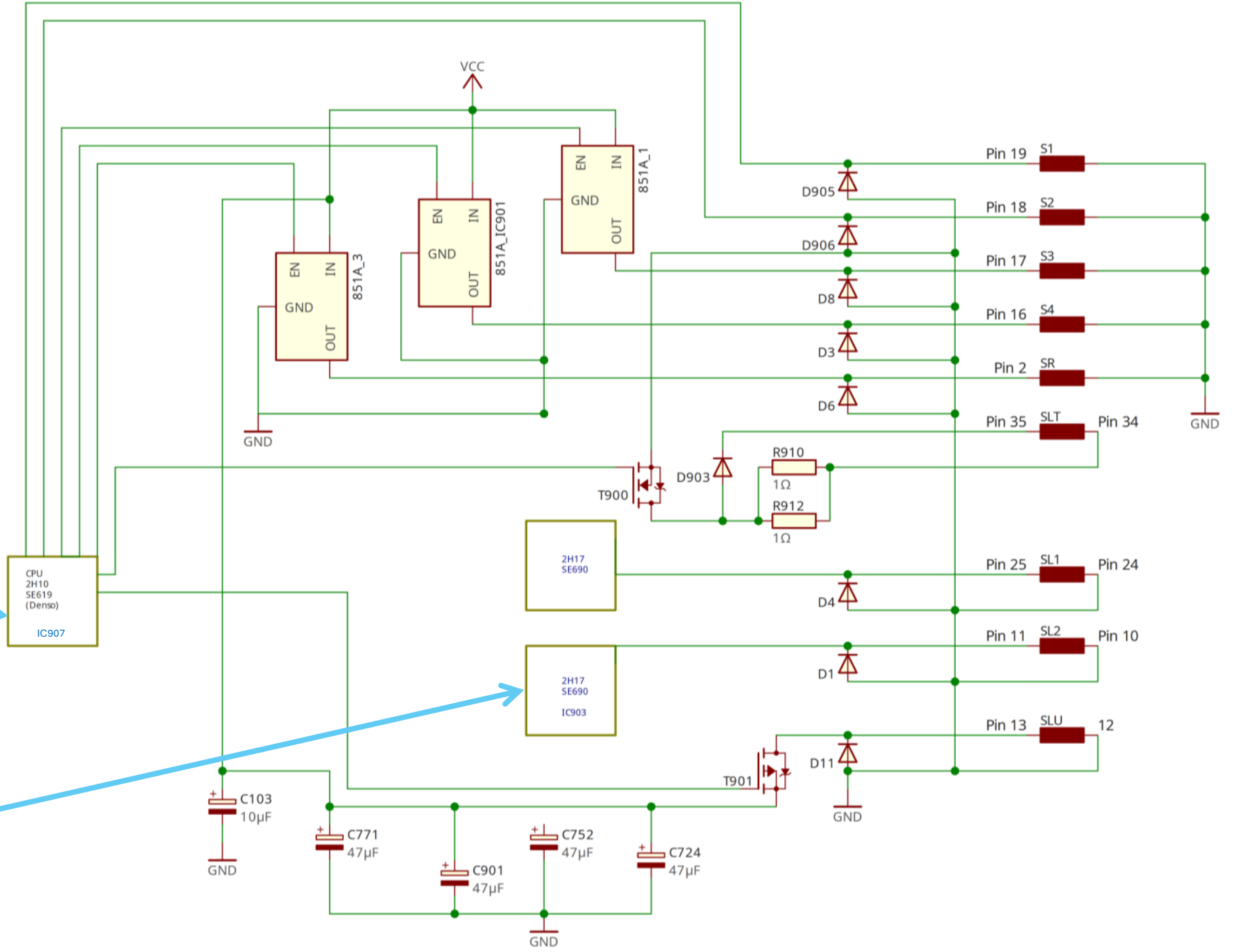


ECT Schematic

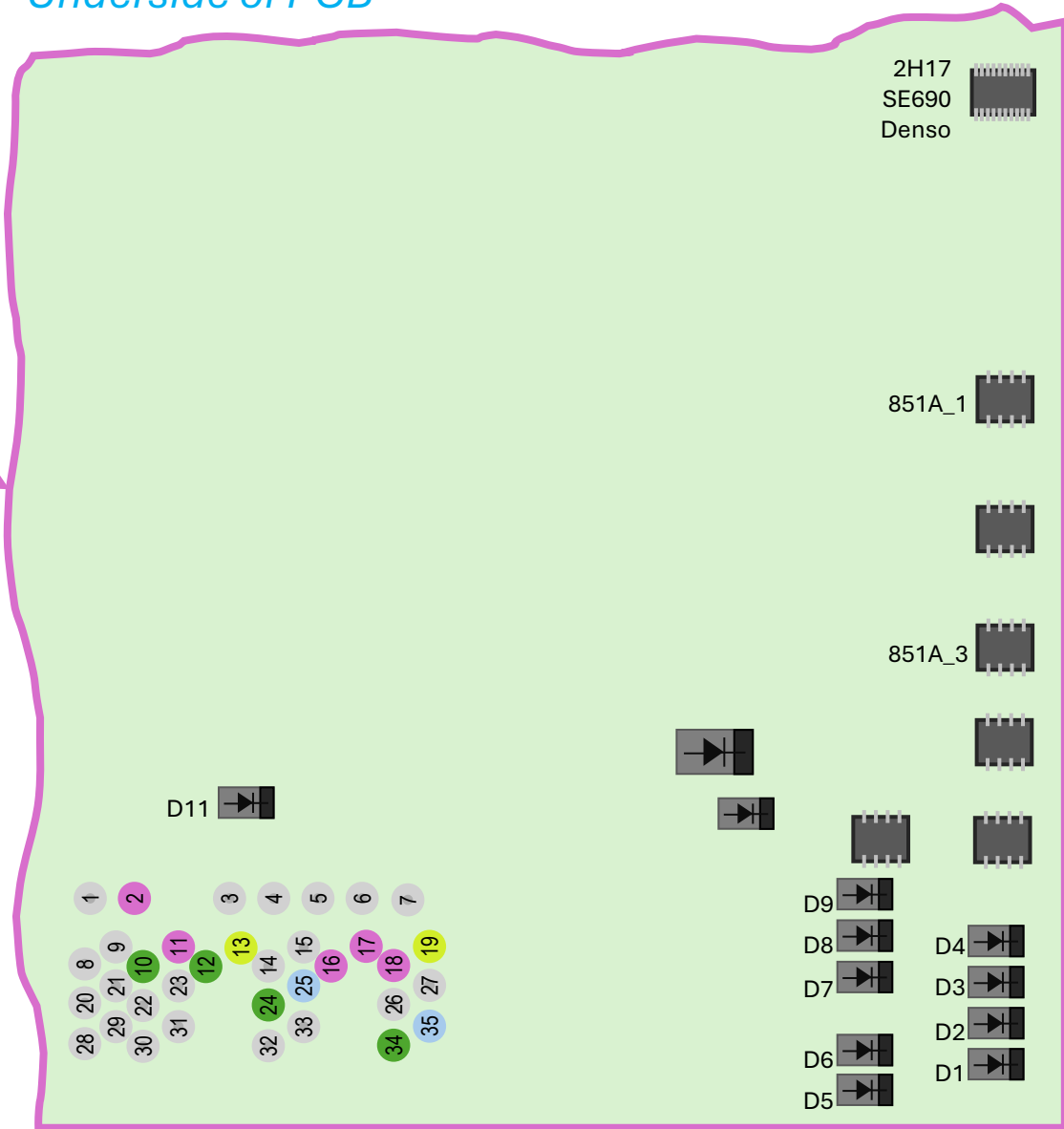
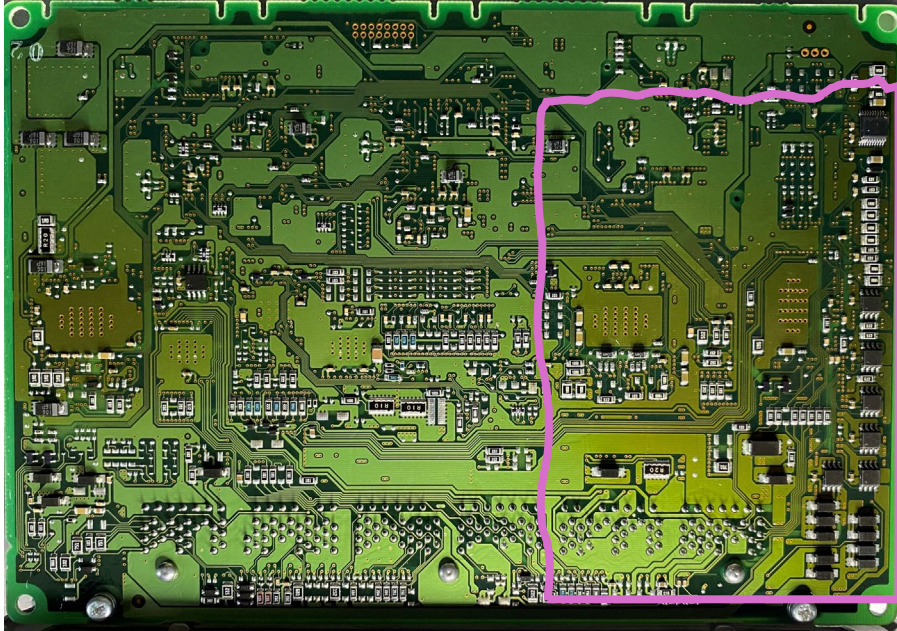
Note: unlabeled component numbers shown as D1 through D11 and 851A_1 through 851A_3 correspond to the diagram on the next page and are not labeled on the ECM PCB

IC907 – this is a Denso integrated circuit with part numbers 2H10 and SE619. It is a proprietary chip, so little is known about it. The solenoids S1, S2 and the gates of T900 and T901 are connected directly to various pins of this chip. Pin numbers are not recorded here.

IC903 – this is a Denso integrated circuit with part numbers 2H17 and SE690. There are two such chips on the PCB, one on the topside and a second on the bottom side. The solenoid connects to pin 20.



Underside of PCB



Pin	Funct.	Purpose
19	S1	1-2 shift, SL Relay
18	S2	2-3, 5-6 shift
17	S3	3-4 shift
16	S4	4-5 shift
2	SR	C4 relay, B1 relay
35	SLT +	Line fluid pressure
34	SLT -	GND
25	SL1 +	Clutch fluid pressure
24	SL1 -	GND
11	SL2 +	Brake pressure control
10	SL2 -	GND
13	SLU +	Lock-up clutch
12	SLU -	GND
27	Oil +	Oil sensor
26	Oil -	GND

