

ZF 8HP INSTRUCTIONS
INSTRUÇÃO PLACA ZF 8HP

Presentation

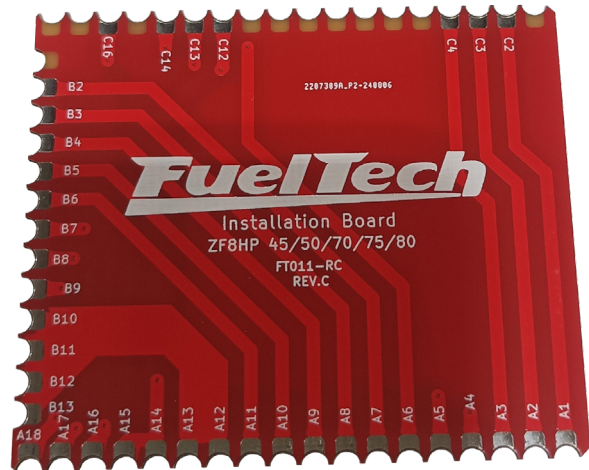
This board was developed to control the ZF 8HP gearbox by a FuelTech ECU. This board must be soldered onto the original gearbox control module.

Follow the steps described below to install the interface board.



IMPORTANT

To control the ZF 8HP gearbox, it is necessary to use a Peak and Hold PRO module to manage the solenoids actuation.



The ZF 8HP gearbox has an internal TCU, it is necessary to open the gearbox mechatronics to access the solenoid controls and thus manage the gearbox.

- Remove the mechatronics from the gearbox.
- Destructively remove the plastic pins marked in figure 2.
- Use a micro grinder to open the original transmission control cover.
- Remove the original transmission control module and replace it with the FuelTech interface board, which will ensure that the external transmission connector has direct contact with the transmission actuation solenoids.

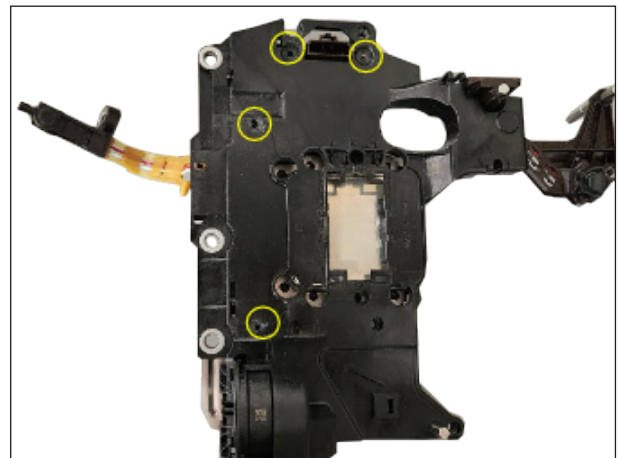
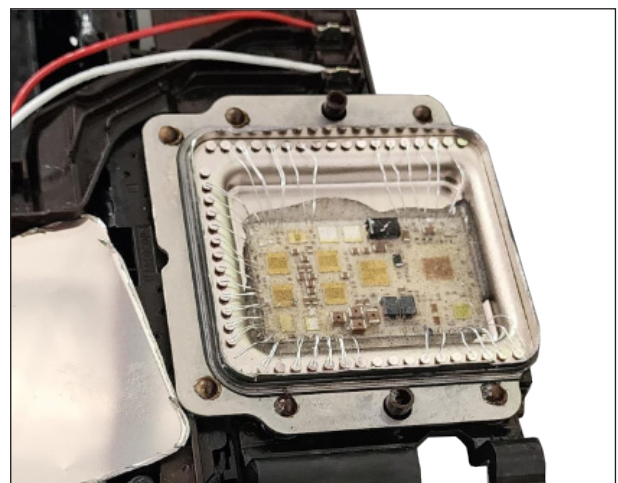
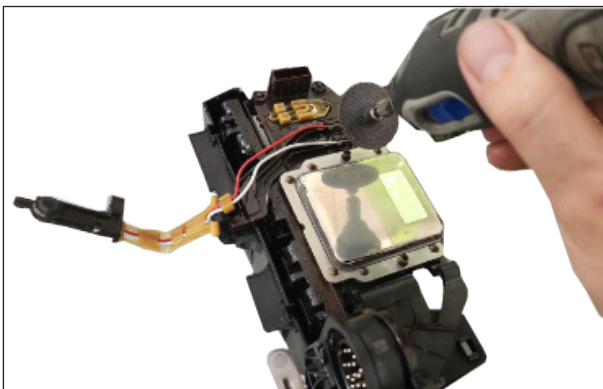


Figure 2



- e) Install the interface board and weld all terminals as shown in figure 6.
- f) Replace the cover and use high-temperature silicone to seal the board.
- g) Reassemble the mechatronics on the gearbox, performing the procedures in reverse order.

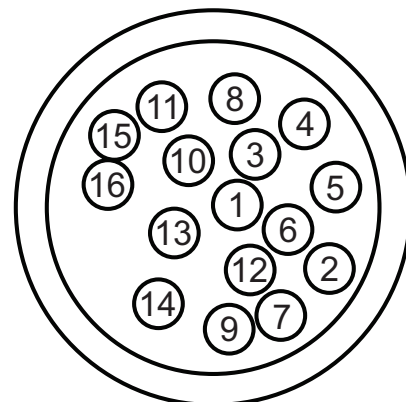


Figure 6



Once the above procedures have been carried out, we have access to the gearbox control solenoids through the external connector to the TCU, so it is possible to make the connection as follows.

Pin connector gearbox	Gearbox function	FT600 function
1	Ground temp sensor gearbox	Ground sensor temp
2	Pression control	Pression control
3	Power 12V primary sensor	12V primary sensor gearbox (RPM)
4	Hydraulic accumulator (Start/Stop)	Switch brake (park)
5	PARK/OFF Solenoid	12V permanent park with engine off
6	Disable PARK solenoid	Switch brake (park)
7	Clutch C	Solenoid C transmsion
8	Primary shaft rotation 28 teeth (2 wire hall + 180 ohm pull down with sensor ground)	Primary sensor signal
9	Clutch E	Solenoid E transmsion
10	Primary shaft rotation 40 teeth (2 wire hall + 180 ohm pull down with sensor ground)	RPM driveshaft signal
11	Clutch A	Solenoid A transmsion
12	Lockup / TCC	Lockup solenoid
13	Gearbox temperature signal	Gearbox temperature signal
14	Power 12V to solenoids	12V to solenoids
15	Clutch D	Solenoid D transmsion
16	Clutch B	Solenoid B transmsion



**IMPORTANT**

The 8HP gearbox originally has a park system that is activated as soon as the solenoid stops receiving power. For safety reasons, it is recommended to use a Park Delete in racing cars, where this activation will be done via cable.

<https://www.seemslegitgarage.com/product-page/dodge-8hp-park-release-kit>

For street cars that use this transmission, a timer module can be used. This way, if for some reason the solenoid or the FT600 loses power, the board will continue to supply power to the park solenoid so that the transmission does not break. This method is used to activate the park.

The park of this transmission is only deactivated when the engine is started and solenoid A pressurizes the line, causing the park to unlock the transmission. Thus, the timer board only maintains the pressure for a certain amount of time so that the park is not activated.

Required inputs and outputs

Three inputs are required: Transmission RPM / Transmission temperature / Cardan RPM

To control this transmission, it is necessary to use 8 outputs: Transmission LockUp / Solenoid A / Solenoid B / Solenoid C / Solenoid D / Solenoid E / Solenoid F / Transmission oil pressure

Configuration in FTManager

Below are the images of the configuration required to use the transmission.

Drive shaft RPM

Select origin
☒ White wire
☐ FT CAN 2.0

Number of teeth
 28.0 teeth

Calculate wheel speed
☒ Enabled
 Differential ratio
 4.00 : 1

Tire type
☐ Slick / DragRace
☒ Radial

Tire size
 28.0 inches

Wheel rim diameter
 18 inches

Tire width
 255 mm

Tire height
 35 %

Signal Filter
☒ Legacy high average points
☐ Noise rejection filtering

Legacy high average points:
 Smoother signal but may be delayed, default filtering method on 4.11 update and older.

Noise rejection filtering:
 Quicker response, more detailed signal.

Input shaft RPM

Select origin
☒ White wire
☐ FT CAN 2.0

Teeth number
 28.0 teeth

The tire type and size configuration will be according to the customer's car, and this is the only information that will be changed depending on the vehicle being used.

☒ Input enabled

Import sensor

Channel name
 Default name
 Transmission temperature

Custom name
 Transmission temperature

Dash name
 Transmission temperature

Unit
 °F

Decimal places
 1 (Min: -3200,0 Max: 3200,0)

Offset
 Offset type
 Disabled

Offset value
 0

Digital filter
☒ Digital filter enabled

Filter frequency
 50

Q factor
 0.60

Calibrate sensor

Input sensor
☐ Default
☒ Custom

Signal type
 Analog

Enable pullup
☒

Averagepoints
 63

Digital sensor setup
 Digital options
 Higher level

Hi level
 0.000 V

Lo level
 0.000 V

☐ Invert output signal

Interpolation table

Voltage	Value
0.000	672.800
0.356	510.800
0.800	413.600
0.990	381.200
1.240	348.800
1.450	316.400
1.850	284.000
2.720	219.200
3.550	154.400
4.120	89.600
4.800	24.800

Fill values

Automatic transmission control configuration

Automatic Transmission Control

Range selector 1, 2, 3 & 4 mode

- ☒ Limit gear up to the lower position
- ☐ Hold gear to the lever position

2 Step line pressure control

- ☒ Enabled

0.0 %

Lock time between upshifts

1.00 s

Lock time between downshifts

0.00 s

Gear change delay during throttle pedalling

- ☒ Enabled

Delay during throttle pedalling

3.00 s

Add delay when TPS reduces from

50.0 %

Activate solenoids between gear shifts

- ☐ Enabled

To configure manual Paddle Shift you need to access the [Paddle Shift](#) menu under Sensors and Calibration

Maximum RPM at each gear										
1	2	3	4	5	6	7	8	9	10	
8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	RPM

Minimum speed at each gear										
1	2	3	4	5	6	7	8	9	10	
0	5	11	16	21	24	28	99	112		Mph

Maximum speed to downshift at each gear										
1	2	3	4	5	6	7	8	9	10	
0	19	31	40	50	62	75	93	124		Mph

Gear shift compensation time start delay										
R	N	1	2	3	4	5	6	7	8	9
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Gear shift compensation time										
R	N	1	2	3	4	5	6	7	8	9
0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.00

Automatic transmission transbrake and staging control

- ☒ Enabled

	Solenoid A	Solenoid B	Solenoid C	Solenoid D	Solenoid E	Solenoid F
Transbrake	☐	☐	☐	☒	☐	☐
Staging	☐	☐	☐	☒	☐	☒

To have Transbrake and Staging control working using Automatic transmission control [@saga control / Transbrake](#) function must be activated, under Drag Race Features menu.

PWM Solenoids				
	S	S	S	S
TPS %	0.0	25.0	35.0	100.0
A - Rise	1.050	1.050	0.300	0.300
A - Fall	0.001	0.001	0.000	0.000
A - Hold	0.001	0.001	0.001	0.001
B - Rise	1.050	1.050	0.300	0.300
B - Fall	0.001	0.001	0.000	0.000
B - Hold	0.001	0.001	0.001	0.001
C - Rise	1.050	1.050	0.300	0.300
C - Fall	0.001	0.001	0.000	0.000
C - Hold	0.001	0.001	0.001	0.001
D - Rise	1.050	1.050	0.300	0.300
D - Fall	0.001	0.001	0.000	0.000
D - Hold	0.001	0.001	0.001	0.001
E - Rise	1.050	1.050	0.300	0.300
E - Fall	0.001	0.001	0.000	0.000
E - Hold	0.001	0.001	0.001	0.001
F - Rise	1.050	1.050	0.100	0.100
F - Fall	0.001	0.001	0.000	0.000
F - Hold	0.001	0.001	0.001	0.001

Solenoids			
Solenoid A ☒ Enabled Output signal ☒ Activated at 0V ☐ Activated at 12V (Only w/ yellow outputs) PWM frequency 75 Hz	Solenoid B ☒ Enabled Output signal ☒ Activated at 0V ☐ Activated at 12V (Only w/ yellow outputs) PWM frequency 75 Hz	Solenoid C ☒ Enabled Output signal ☒ Activated at 0V ☐ Activated at 12V (Only w/ yellow outputs) PWM frequency 75 Hz	Solenoid D ☒ Enabled Output signal ☒ Activated at 0V ☐ Activated at 12V (Only w/ yellow outputs) PWM frequency 75 Hz
Solenoid E ☒ Enabled Output signal ☒ Activated at 0V ☐ Activated at 12V (Only w/ yellow outputs) PWM frequency 75 Hz	Solenoid F ☒ Enabled Output signal ☒ Activated at 0V ☐ Activated at 12V (Only w/ yellow outputs) PWM frequency 75 Hz	Solenoid G ☐ Enabled Output signal ☒ Activated at 0V ☐ Activated at 12V (Only w/ yellow outputs) PWM frequency 75 Hz	Solenoid H ☐ Enabled Output signal ☒ Activated at 0V ☐ Activated at 12V (Only w/ yellow outputs) PWM frequency 75 Hz
Line pressure solenoid ☐ Enabled Output signal ☒ Activated at 0V ☐ Activated at 12V (Only w/ yellow outputs) PWM frequency 75 Hz	Accumulator solenoid ☐ Enabled Output signal ☒ Activated at 0V ☐ Activated at 12V (Only w/ yellow outputs) PWM frequency 75 Hz		

Gear change trigger table						
Upshift						
	Solenoid A	Solenoid B	Solenoid C	Solenoid D	Solenoid E	Solenoid F
P	☒	☒	☒	☒	☒	☐
R	☒	☐	☒	☒	☒	☒
N	☒	☒	☒	☒	☒	☒
1	☒	☒	☐	☒	☒	☒
2	☒	☒	☒	☒	☐	☒
3	☐	☒	☐	☒	☐	☒
4	☐	☐	☒	☒	☐	☒
5	☐	☐	☐	☒	☒	☒
6	☐	☐	☐	☐	☐	☒
7	☒	☐	☐	☐	☒	☒
8	☒	☐	☒	☐	☐	☒
Downshift						
	Solenoid A	Solenoid B	Solenoid C	Solenoid D	Solenoid E	Solenoid F
P	☒	☒	☒	☒	☒	☐
R	☒	☐	☒	☒	☒	☒
N	☒	☒	☒	☒	☒	☒
1	☒	☒	☐	☒	☒	☒
2	☒	☒	☒	☒	☐	☒
3	☐	☐	☐	☒	☐	☒
4	☐	☐	☒	☒	☐	☒
5	☐	☐	☐	☒	☒	☒
6	☐	☐	☐	☐	☐	☒
7	☒	☐	☐	☐	☒	☒
8	☒	☐	☒	☐	☐	☒

[illegible]

Output configuration

	Actuation	Preset	Peak (A)	Hold (A)
Channel	Cylinder 1 - Primary	Custom	2.0	1.2
# 2	Cylinder 2 - Primary	Custom	2.0	1.2
# 3	Cylinder 3 - Primary	Custom	2.0	1.2
# 4	Cylinder 4 - Primary	Custom	2.0	1.2
# 5	Cylinder 5 - Primary	Custom	2.0	1.2
# 6	Cylinder 6 - Primary	Custom	2.0	1.2
# 7	Cylinder 7 - Primary	Custom	2.0	1.2
# 8	Cylinder 8 - Primary	Custom	2.0	1.2

☐ Advanced configurations

Safety protections

Protections

Failure	ECU safety alert	Shut driver off
Injector disconnected	☐	☐
Injector short-circuited	☒	☐
Hardware overheating warning	☒	☐
Driver self check	☒	☐

ECU safety alert: The driver sends the fault to the ECU. The Pi4 Pro Injector Driver alert must be enabled on the ECU map to indicate the action to be taken.

Read driver
Write driver
Erase configuration

Set as a B module
Serial number:



Firmware version

Hardware version

Serial number

Size (L)	TPS (%)																
	N2C	0.50	0.75	0.90	1.00	1.10	1.20	1.30	1.40	1.50	16.00	20.00	30.00	40.00	60.00	70.00	100.00
0.100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	66.3	58.0	44.2	29.5	0.0	0.0	0.0	0.0	0.0
0.150.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	66.3	58.0	44.2	29.5	0.0	0.0	0.0	0.0	0.0
0.200.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	66.3	58.0	44.2	29.5	0.0	0.0	0.0	0.0	0.0
0.250.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	66.3	58.0	44.2	29.5	0.0	0.0	0.0	0.0	0.0
0.300.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	66.3	58.0	44.2	29.5	0.0	0.0	0.0	0.0	0.0
0.400.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	66.3	58.0	44.2	29.5	0.0	0.0	0.0	0.0	0.0
0.500.0	100.0	100.0	100.0	100.0	75.0	75.0	66.3	58.0	44.2	29.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.600.0	100.0	100.0	100.0	80.0	50.0	50.0	50.0	42.0	29.2	14.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.700.0	100.0	100.0	100.0	90.0	60.0	60.0	66.3	58.0	44.2	29.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.800.0	100.0	100.0	100.0	100.0	80.0	60.0	66.3	58.0	44.2	29.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Apresentação

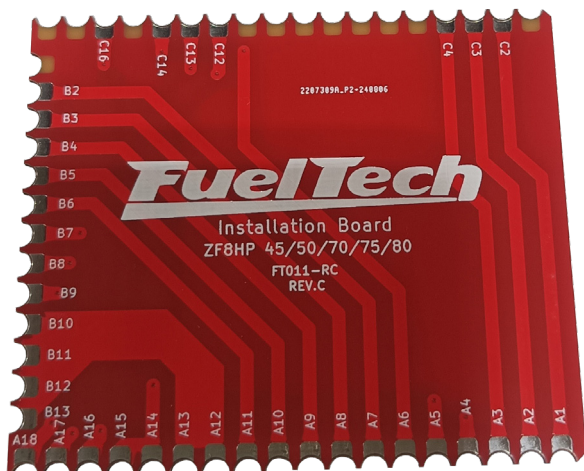
Esta placa foi desenvolvida para o controle do câmbio ZF 8HP por uma ECU FuelTech. Esta placa deve ser soldada sobre o módulo de controle original do câmbio.

Siga os passos descritos abaixo para instalar a placa de interface.



IMPORTANTE

Para o controle do câmbio ZF 8HP é necessário utilizar um módulo Peak and Hold PRO para gerenciar os solenoides de atuação.



O câmbio ZF 8HP possui uma TCU interna, é necessário abrir a mecânica do câmbio para ter acesso aos comando das solenoides e assim gerenciar o câmbio.

- a) Remover de mecânica do câmbio.
- b) Remover destrutivamente os pinos plásticos marcados na figura 2.
- c) Utilizar uma micro retífica para abrir a tampa do controle original do câmbio.
- d) Remover o módulo de controle original do câmbio e substituir pela placa de interface FuelTech que fará com que o conector externo ao câmbio tenha contato direto as solenoides de acionamento do câmbio.

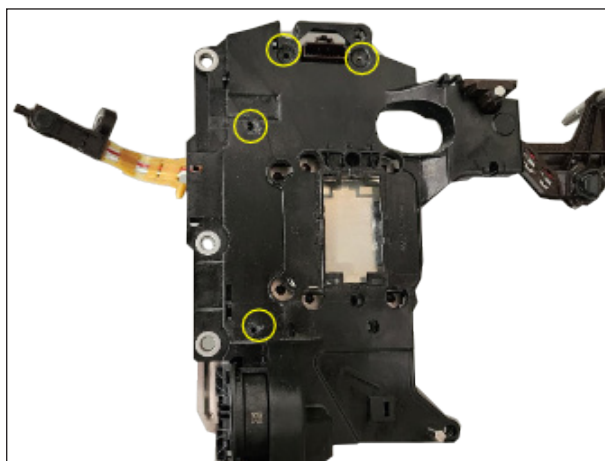
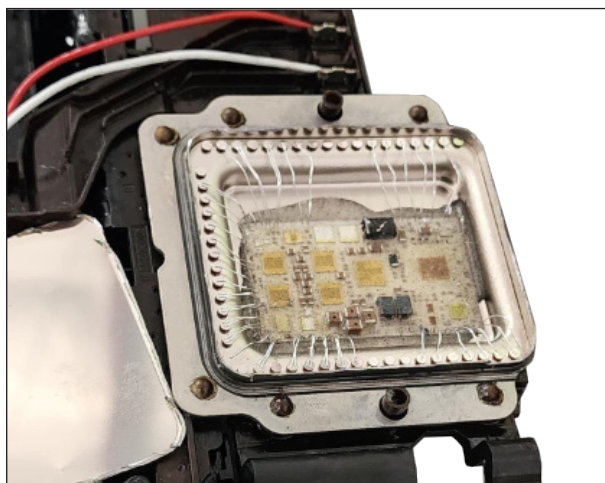
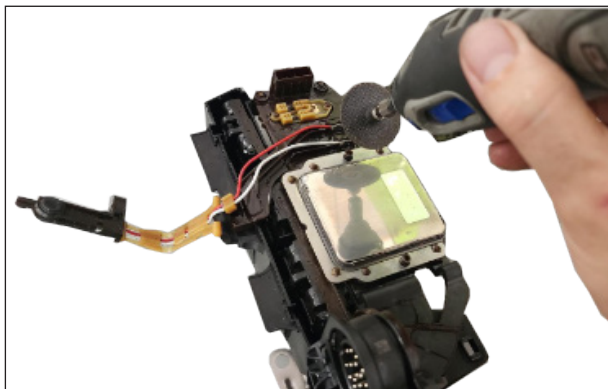


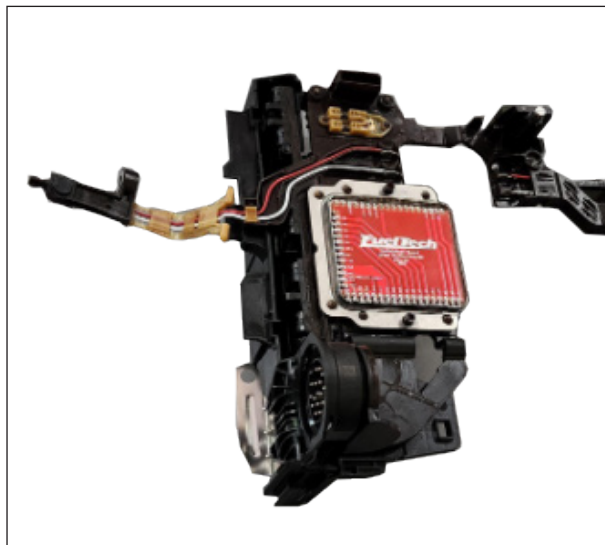
Figura 2



- e) Instalar a placa de interface e soldar todos os terminais conforme mostrado na figura 6.
- f) Coloque a tampa novamente e utilize um silicone para alta temperatura para selar a placa.
- g) Montar a mecatrônica novamente no cambio, executando os procedimento na ordem inversa.

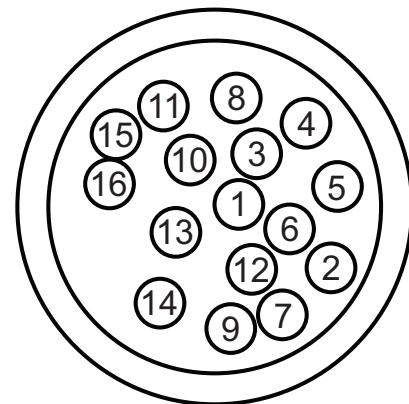


Figura 6



Realizado os procedimentos acima temos acesso as solenoides de controle do câmbio pelo conector externo a TCU, deste modo é possível fazer a ligação da seguinte forma.

Pino conector câmbio	Função câmbio	Função FT600
1	Terra sensor de temperatura câmbio	Terra sensor de temperatura
2	Controle de pressão	Controle de pressão
3	Alimentação 12V sensor primário	12V sensor primário do câmbio (RPM)
4	Acumulador hidráulico (Start/Stop)	Switch de freio (park)
5	Solenoide PARK/OFF	12V constante park motor desligado
6	Desativa solenoide PARK	Switch de freio (park)
7	Embreagem C	Solenoide C transmissão
8	Rotação eixo primário 28 dentes (hall 2 fios + pull down 180 ohms com terra de sensores)	Sinal sensor primário
9	Embreagem E	Solenoide E transmissão
10	Rotação cardan 40 dentes (hall 2 fios + pull down 180 ohms com terra de sensores)	Sinal RPM cardan
11	Embreagem A	Solenoide A transmissão
12	Lockup / TCC	Solenoide lockup
13	Sinal temperatura câmbio	Sinal sensor de temperatura
14	Alimentação 12V para solenoides	12V para solenoides
15	Embreagem D	Solenoide D transmissão
16	Embreagem B	Solenoide B transmissão





IMPORTANTE

O câmbio 8HP originalmente possui um sistema park que é acionando assim que a solenoide para de receber alimentação. Por questão de segurança é recomendado a utilização de um Park delete em carros de corrida, onde este acionamento se dará via cabo.

<https://www.seemslegitgarage.com/product-page/dodge-8hp-park-release-kit>

Para carros de rua que utilizarem este câmbio pode se usar um módulo temporizador, assim se por algum motivo a solenoide ou a FT600 percam alimentação a placa continuara alimentando a solenoide park para que não ocorra a quebra do câmbio. Utilizando este meio para o acionamento do park.

O park deste câmbio é somente desativado quando o motor é ligado e a solenoide A pressuriza a linha fazendo com que o park destrave o câmbio, assim a placa temporizada apenas mantem a pressão por um determinado tempo para que o park não seja acionado.

Entradas e saídas necessárias

São necessárias 3 entradas: RPM do câmbio / Temperatura do câmbio / RPM de Cardan

Para controle deste câmbio é necessário a utilização de 8 saídas: LockUp do câmbio / Solenoide A / Solenoide B / Solenoide C / Solenoide D / Solenoide E / Solenoide F / Pressão de óleo do câmbio

Configuração no FTManager

Abaixo segue as imagens de configuração necessária para a utilização do câmbio.

Rotação do cardan

Seleção da origem

☒ Fio branco

☐ FT CAN 2.0

Quantidade de dentes

28,0 dentes

Calcular velocidade da roda

☒ Habilitado

Relação do diferencial

4,00 : 1

Tipo de pneu

☐ Slick / DragRace

☒ Radial

Tamanho do pneu

28,0 pol

Aro da roda

18 pol

Largura pneu

255 mm

Perfil do pneu

35 %

Filtro de sinal

☒ Filtro de alto nível de médias

☐ Filtro de rejeição de ruído

Filtro de alto nível de médias:
Sinal mais amortecido, pode apresentar atraso de leitura, filtro padrão das versões 4.11 e anteriores

Filtro de rejeição de ruído:
Resposta mais rápida, maior detalhamento do sinal

Rotação do câmbio

Seleção da origem

☒ Fio branco

☐ FT CAN 2.0

Quantidade de dentes

28,0 dentes

A configuração de tipo e tamanho de Pneu serão conforme as do carro do cliente, sendo dentre as informações as únicas que serão alterada conforme o veículo que esta utilizando.

☒ Entrada habilitada

Importar sensor

Nome do Canal

Nome predefinido

Temperatura da transmissão

Nome customizado

Temperatura da transmissão

Nome no painel

Temperatura da transmissão

Unidade

°C

Casas decimais

1 (Min: -3200,0 Max: 3200,0)

Offset

Tipo de offset

Desabilitado

Offset de leitura

0

Filtro digital

☒ Filtro digital habilitado

Frequência do filtro

50

Fator Q

0,60

Calibrar sensor

Sensor de entrada

☐ Predefinido

Temperatura Fiat (Brasil)

☒ Customizado

Tipo de sinal

Análogica

☒ Ativar pullup

Número de pontos de média

63

Opções para sensor digital

Configuração digital

Nível superior

Nível superior

0,000 v

Nível inferior

0,000 v

☐ Inverter sinal de saída

Tabela de interpolação

Tensão	Valor
0,000	356,0
0,356	266,0
0,800	212,0
0,990	194,0
1,240	176,0
1,450	158,0
1,850	140,0
2,720	104,0
3,550	68,0
4,120	32,0
4,800	-4,0

Preencher valores



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