MM4X4 VEHICLE ELECTRONICS

FOR ALL MITSUBISHI VEHICLES

OBD2 Reader Programming for Transmission PIDs

Revision F – 10/25

This article provides an understanding of why you should monitor the transmission oil temperature and a step by step guide for setting up two of the common OBDII solutions:

1. UltraGauge MX
2. ScanGaugeII
3. TORQUEPRO App (android only) with ELM327 dongle

The article is directly applicable for the Mitsubishi **Pajero** (NS, NT, NW, NX), **Challenger** (PB and PC), **Triton** (MN, MQ and MR), and **Pajero Sport**.

Why Monitor the Transmission Oil Temperature?

The transmission oil may get excessively hot when towing, driving in soft sand, or climbing long and steep hills. Transmission damage due to overheating is a major cause of expensive rebuilds. Monitoring your transmission oil temperature is important to enable the driver can take action to avoid over-heating.

Just as the engine coolant temperature gauge should be monitored to avoid the engine over-heating, so should the transmission oil. Unfortunately, vehicles do not come with a gauge as standard, and instead have a high (extreme) temperature warning lamp.

The transmission oil starts to deteriorate above 125°C, and in the Pajero (for example) the transmission warning lamp doesn't come on unit 147°C. Well before the oil reaches this temperature the driver should take action to cool it down to protect the transmission's internal parts.

The cause of high temperatures is the torque converter slipping

The torque converter is a fluid coupling between the engine and transmission. As the oil passes through the torque converter under higher load it rises by 20-30°C. To remove this heat the oil then passes through a small oil cooler (radiator) that is placed in front of the larger engine radiator.

The standard transmission oil cooler is not able to remove enough heat under higher loads (eg, extended towing up hills). As a result, the transmission oil slowly gets hotter and hotter. The factory system relies on extended periods of lower loads to allow the oil cooler to reduce the temperature again.

Typical solutions are:

1. Install a larger after-market transmission cooler that is able to remove more heat. This extra heat, however, goes into the engine raditator (causing increased coolant temperature), and the air conditioning radiator (causing reduced air-con performance).

2. Or, install a torque converter lockup kit that stop the heat being generated in the first place. **auto-matePRO, auto-mate** and **lockup-mate®** (available from mm4x4.com.au) keep the torque converter locked to prevent excessive heat being generated, thus protecting the transmission from over-heating. That excessive heat is actually wasted fuel, so with a lockup kit you also get the benefit of up to 20% better fuel ecconomy.

Want to read more? There's a wealth of knowledge available. Below are a some articles from the US. Please note that the mentioned temperatures are in ºF not ºC.

- link to a ºF converter
- https://www.transmissionrepaircostguide.com/transmission-overheating/
- https://www.lakecityautocare.com/blog/what-to-do-when-your-transmission-is-overheating

How to monitor the transmission oil temperature?

You can monitor the transmission oil by either installing a dedicated after-market gauge, or more commonly people use an OBD2 reader that connects to the vehicle's diagnostic port. The OBD2 standard does not specify the need to report transmission oil temperature, so most OBD2 readers don't provide this ability off-the-shelf. The reader needs to be able to be programmed to read and display the transmission temperature. Not all readers have this capability.

Transmission Temperature Sensors

There are two temperature sensors available in the AISIN transmission, and one temperature sensor in the JATCO transmission.

- **Pan Temperature Sensor**

  The pan temperture sensor is located in the main oil reseviour of the transmission. This temperature reading varies slowly as the oil in the whole reseviour warms up or cools down.

  auto-mate monitors this temperature to determine if the minimum operating temperature has been reached before commencing operation.

- **Pipe Temperature Sensor [AISIN TRANSMISSION ONLY]**

  The pipe temperature sensor is located between the output of the torque converter and the transmission.

  When the torque converter is unlocked, this temperature increases by 10-30ºC according to the amount of slippage of the torque converter.

  When the torque converter is locked, minimal heat is generated and this temperature drops to the same value as the pan temperature.

Which temperature sensor to monitor?

If you only wish to setup one oil temperature gauge, we recommend the pipe temperature is chosen as this measures the oil at its hottest point.

UltraGauge MX Setup

The UltraGauge MX has the ability to access non-standard, manufacturer specific gauges such as the transmission oil temperature.

NOTE: The UltraGauge EM does not have this capability, so the MX version should be purchased.

To monitor your transmission temperature, you need to program the UltraGauge to read the sensors from the transmission computer using the M-Gauge feature.

The following steps will setup the M-Gauge to measure your chosen temperature (Pipe Temperature, or Pan Temperature).

If you want to monitor both temperature sensors, repeat the whole process and create two M-Gauges (one for each temperature sensor).

Enter the M-GAUGE Menu

These instructions assume you are familiar with how to use the UltraGauge menu system and how to setup a page to display your preferred vehicle parameters onto the gauge screen. If not, please refer to the UltraGauge operating manual for more detail.

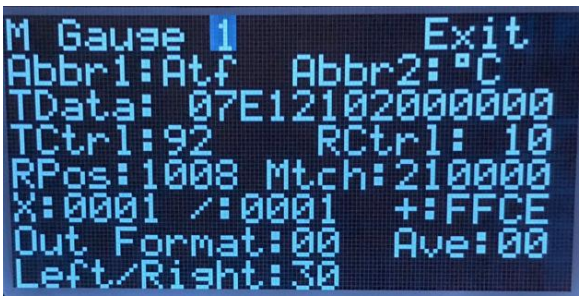
DISPLAY	NOTES
	Enter the main menu and select the *Gauge/Page…* menu
	Select *Gauge/Page…* menu
	Select the *M Gauge setup* menu

Next steps are vehicle model dependent. Setup the screens EXACTLY as shown.

AISIN Transmission

Pajero Diesel (NT, NW, NX)
Pajero Sport
Triton MQ, MR

Pipe Temperature



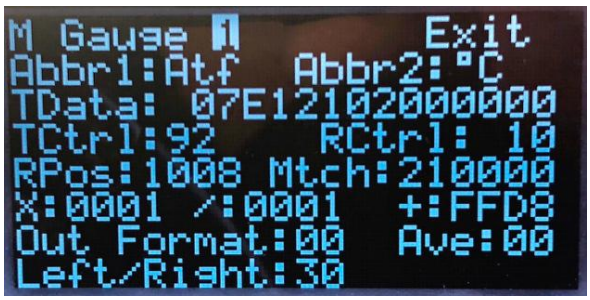
OR

Pan Temperature

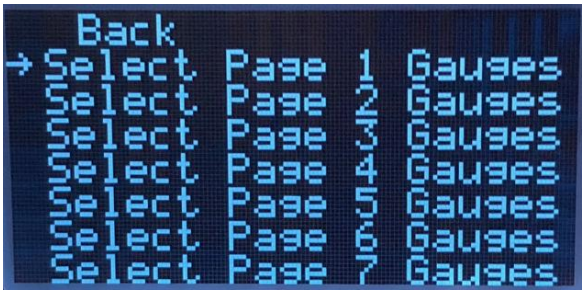
JATCO Transmission

Pajero Diesel (NS)
Pajero Petrol (NS, NT, NW)
Challenger PB, PC
Triton MN (4 and 5 sp)

Pan Temperature



Now add the new M Gauges to the page display



Choose the page onto which the gauge will be displayed

Using NEXT, scroll to the MGauge screen, and choose the page locations to display the gauges; position 5 and 3 in this example.

To confirm your gauge has been setup correctly for your vehicle, after the vehicle has been off for many hours (overnight) the various temperature sensors should measure the same reading (+/- 1 ºC)

ScanGauge™ Setup

The ScanGauge^{II} features the X-Gauge™ programmable gauge system that gives you the ability to customise your ScanGaugeII by adding additional vehicle specific digital gauges. To monitor your transmission temperature, you need to program the ScanGauge to read the sensors from the transmission computer using the X-Gauge™ feature.

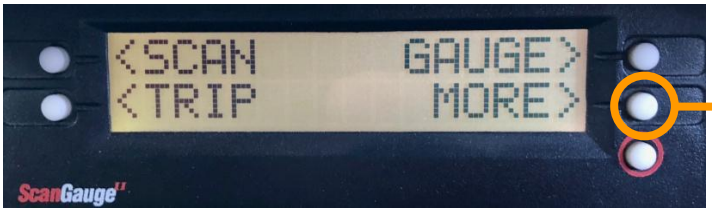
The following steps will setup the X-Gauge to measure your chosen temperature (Pipe Temperature, or Pan Temperature).

If you want to monitor both temperature sensors, repeat the whole process and create two X-Gauges (one for each temperature sensor).

Programming ScanGauge^{II}

Enter the XGAUGE Menu:

DISPLAY	BUTTON TO PRESS



MORE>

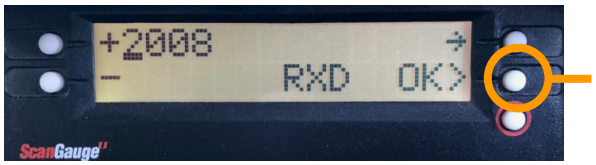
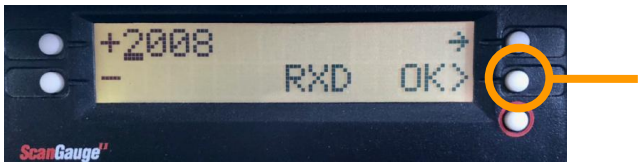
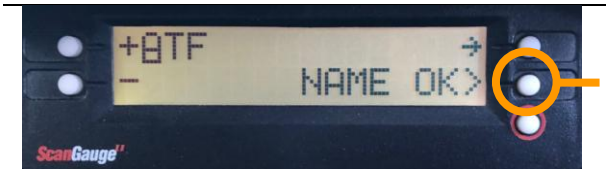
MORE>

DISPLAY	BUTTON TO PRESS
	< MODE >
	EDIT >
	3> Repeatedly press until a 'blank' position is available (3 in this example).
	EDIT>

Enter PID for temperature measurement:

DISPLAY	BUTTON TO PRESS
	Enter number shown 07E12102 then OK>
	Enter number shown, then OK>

Next steps are vehicle dependent:

AISIN Transmission	**JATCO Transmission**
Pajero Diesel (NT, NW, NX) Triton MQ, MR Pajero Sport	Pajero Diesel (Na) Pajero Petrol (NS, NT,NW) Challenger PB, PC Triton MN (4 and 5 sp)
Pipe Temperature  **OR** **Pan Temperature**  	**Pan Temperature** 
Offset (-50 °C)  	**Offset (-40 °C)** 
 	Enter the name for the gauge of your choice, eg, ATF , ATF2, PIPE, PAN etc.
 	SAVE>

TORQUE app Setup

TORQUE is an OBD2 reader app for your android smartphone that connects via bluetooth to an ELM327 dongle which is attached to the vehicles OBD2 port. ELM327 dongles can be purchased from companies such as OBD2 Australia or Jaycar.

There are two versions available, Lite (free), and Pro ($5). TORQUEPRO is the version required to read the temperature sensors.

> TORQUEPRO may not work in some vehicles which have a MM4X4 lockup kit installed. For details, visit our website and read a document regarding OBD2 compatibility here.

CarScanner is our recommended app, which works with all our products, and on both Apple and Android smartphones.

Most apps allow you to purchase or download pre-defined vehicle specific 'packs'. However, we've found for the Mitsubishis they often get the transmission offset value incorrect, and may display a value 10°C too high. To check for accuracy, in the morning when the car is cold, the engine and transmission temperatures should be the same (within 1°C).

We recommend you always create your own custom PID for the transmission temperature, so you know it is correctly programmed for your vehicle.

TORQUEPRO enables you to create custom PIDs to read the vehicle sensors. To monitor your transmission temperature, you need to program it to read the sensors from the transmission computer.

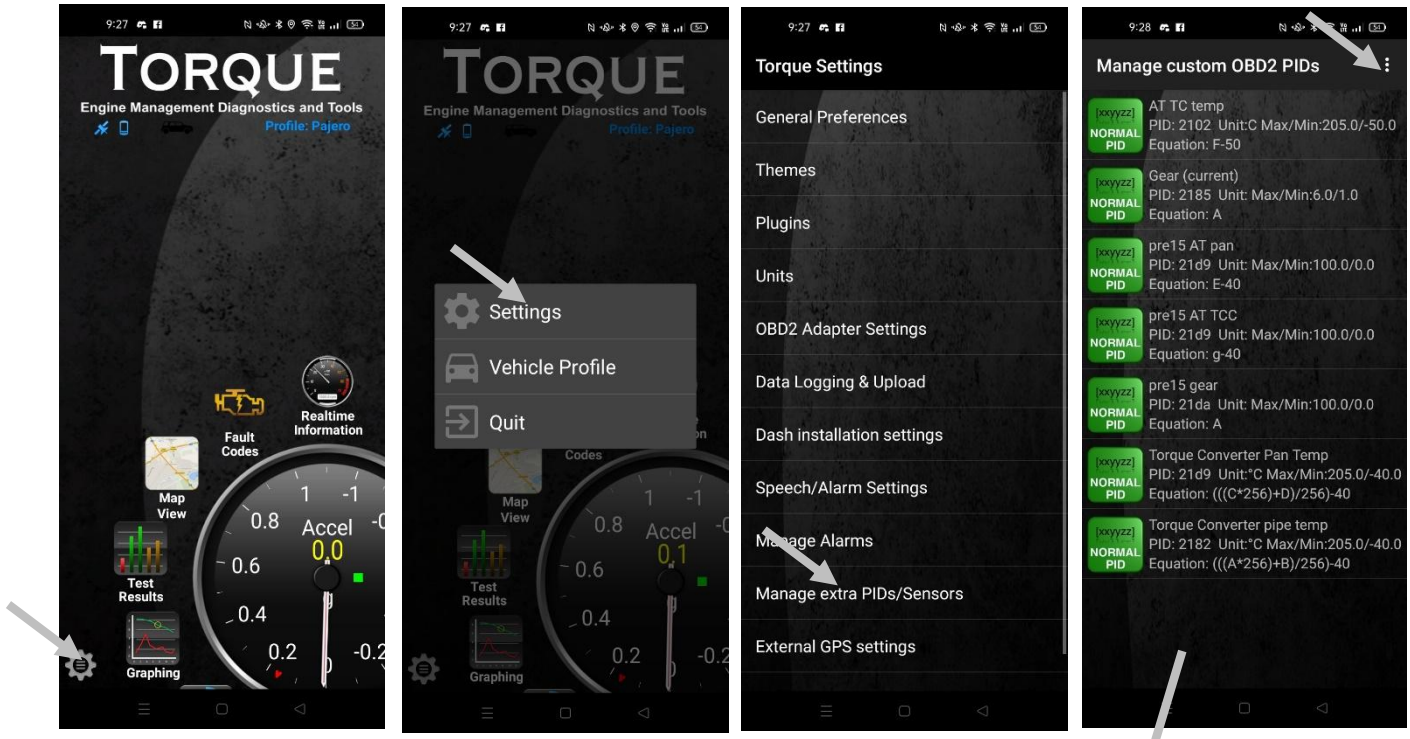
The following steps will setup TORQUEPRO to measure your chosen temperature (Pipe Temperature, or Pan Temperature). NOTE: Only vehicles with an AISIN transmission have two sensors.

If you want to monitor both temperature sensors, repeat the whole process and create two PIDs (one for each temperature sensor).

Once created, a gauge can be added to the TORQUEPRO display to show the temperature values.

Programming TorquePro

Open the PID Editor

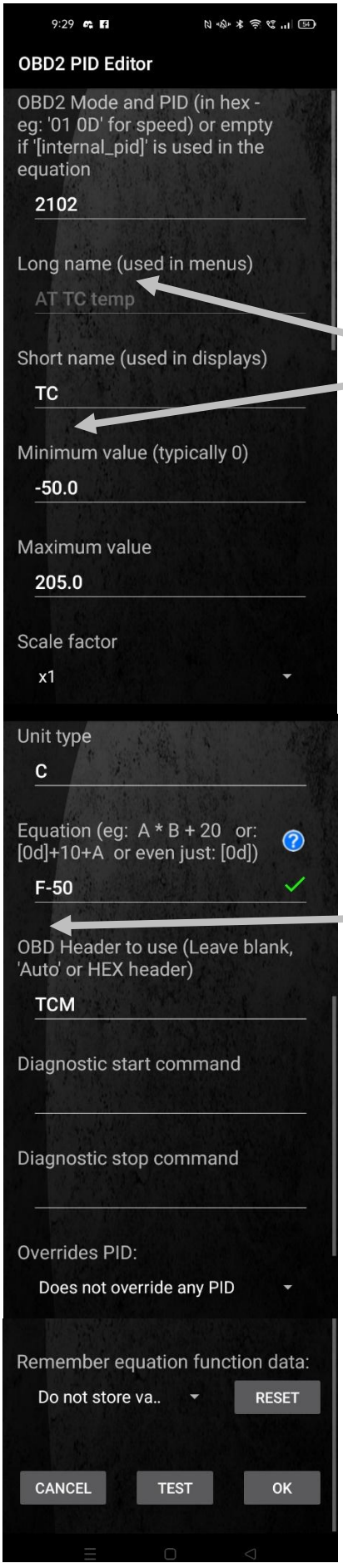


Select Add custom PID from the popup menu

The next screen is the PID Editor. Enter the parameters as shown.

Create another custom PID if you want both sensors to be configured.

Add a gauge to the Torque screen to display the temperature sensor.



Enter the PID parameters as shown, and press TEST to ensure it reads the sensor correctly.

NOTE: The vehicle ignition must be ON, and TORQUEPRO connected to the dongle.

When finished, press OK

Enters Labels for your custom sensors eg.
TC (for pipe temp)
Pan (for pan temp)

AISIN Transmission	JATCO Transmission
Pajero **Diesel** NT,NW,NX	Pajero **Diesel** NS
Triton MQ, MR	Pajero **Petrol** NS,NT,NX
Pajero Sport	Challenger PB, PC
F-50 = Pipe Sensor	Triton MN
G-50 = Pan Sensor	**F-40** = Pan Sensor