Listening to the Pure 3 Travatos

An aural field guide to Travatos equipped with the Pure 3 Energy System

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Acknowledgements

Thanks to Graham Smith, who has written two excellent reference guides to the Pure 3 system and its autostart fast-idle charging subsystem that should be in every Pure 3 owner's library. They can be found on the TOWB Resource page: https://travato.group/#.

Winnebago's Travato knowledgebase diagrams were helpful aids.

Introduction

The Travato KL and GL do not have a noisy generator, but neither are they totally silent. In addition to the usual automatic appliances in the rig, like the refrigerator and the Truma furnace/water heater, there are 6 main Pure 3 components in and about the coach. Four of them automatically make some sort of noise, mostly from their cooling fans. Each of those fans turns on and off according to the temperature control needs of their associated Pure 3 component. This document will help you identify what you are hearing and what your rig is telling you.

This document does not discuss coach appliances that generate noise as a direct consequence of operator action, such as the water pump or coach ventilation fans.

Applicability

The information herein is valid for KL and GL Travatos including the late 2020.5 models.

A Note to the Listener

The noises discussed herein are mostly faint, completely normal, and you will quickly get used to them. The Pure 3 related noises are generally not user-controllable, so you have no choice. Just consider them the music of a happy ship.

If you are confused as to the source of a noise, use this guide to shut off suspect noise generators one by one until the noise source is isolated.

The Pure 3 Energy System

The Operator's Manual for the Travato KL/GL shows this diagram of the Pure 3 system:

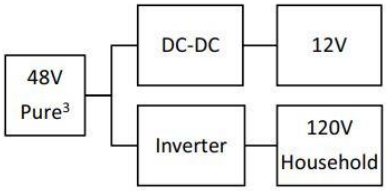

FIGURE 1. OPERATOR'S MANUAL PURE 3 DIAGRAM

Which is great for understanding how the Pure 3 power pack delivers power to the coach's 12V DC and 110V AC loads, but not much else. This diagram, taken from the Pure 3 Guide, is a more complete representation that includes the engine-charging, solar, and shore power components and pathways. More importantly, it shows how the functions of Figure 1 are packaged – which is key to understanding what you are hearing when the system is running.

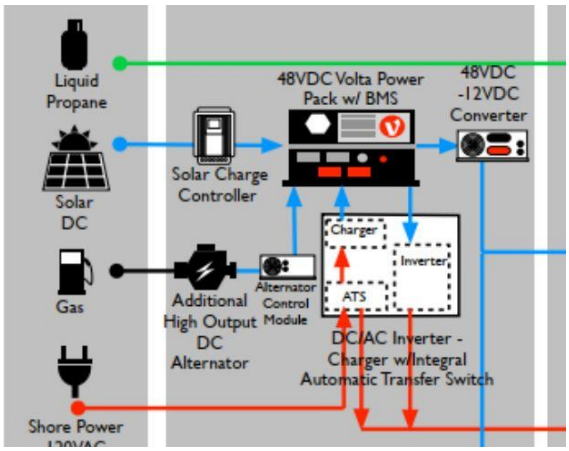

FIGURE 2. KL/GL CONCEPTUAL POWER FLOW DIAGRAM (PORTION)

In this diagram, a red line indicates a 110V AC pathway, and a blue line indicates a DC pathway – either 48V or 12V. The 6 main Pure 3 system components are:

1. Power Pack / Battery Management System (BMS)
2. Inverter / Shore Power Charger / Automatic Transfer Switch
3. DC – DC Converter
4. Solar Charge Controller
5. Alternator Control Module
6. Alternator

The alternator is in the engine compartment; the Power Pack / BMS is underneath the floor of the coach, and the remaining components are inside the coach.

There are two other coach appliances operate automatically and make noise:

7. Refrigerator
8. Truma

The Noises

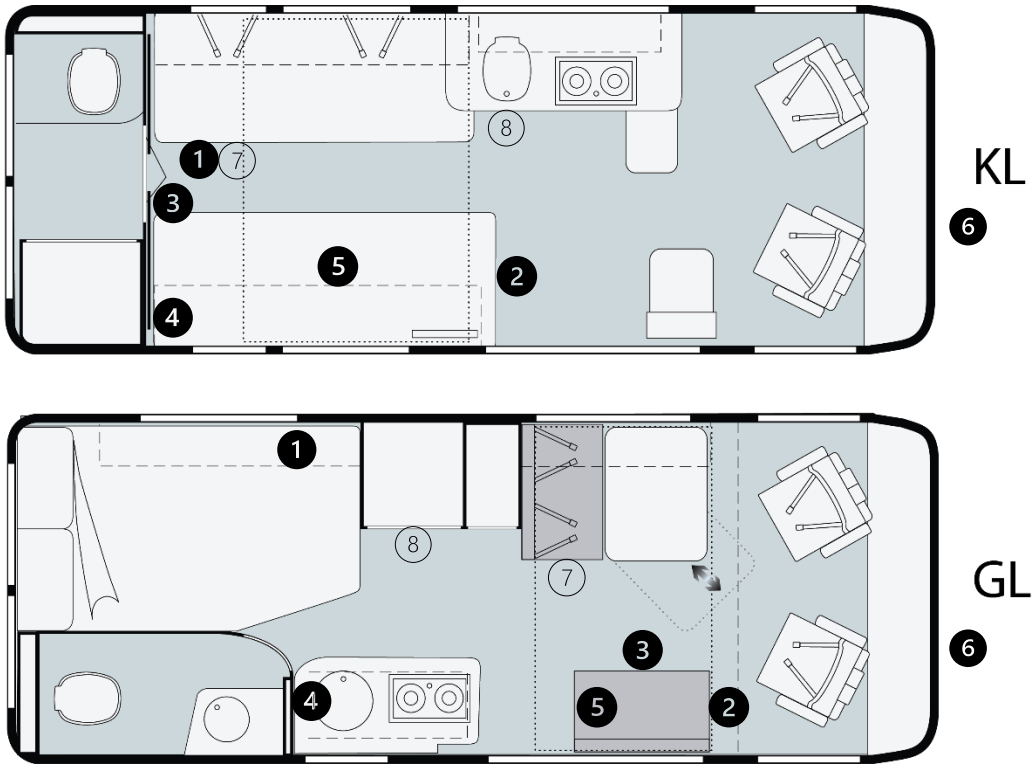

FIGURE 3. NOISE SOURCES FOR THE KL AND GL

The numbers on Figure 3 identify the emanation point of the noises produced by the Pure 3 system components in the KL and GL or the physical location of those components, following the numbering in the list above. The black background numbers are Pure 3 system related.

Noise 1: Low, constant fan whine.

When heard:	whenever the Power Pack is too hot, and in pre 2020.5 rigs, when the Power Pack is too cool. Usually most evident at night when everything else in the rig is shut off.
From where:	in the KL, from the grille underneath the aft end of the driver's side bed. in the GL, from the grille at the bottom of the garage storage cabinets. outside, aft of the rear tires of the RV.
Source:	Power Pack temperature control fan
What's happening:	the Travato "borrows" coach air to efficiently maintain Power Pack temperature. The BMS turns the fan on and off according to the table in the Operator's manual. In Early KL and GL Travatos coach air recirculation was used for both heating and cooling. In the 2020.5 model year heating pads replaced the fan for pack heating. The fan was retained for pack cooling. The heating pads are 110V AC, which requires that the inverter be on or the rig connected to shore power – see Noise 2 below.
User Controls:	the fan operates completely under BMS control. In 2020.5 and later rigs, turning the inverter off when boondocking makes for quiet nights, but disables the power pack heating pads. If the pack then gets too cold it won't charge until reheated, which can mean finding shore power if the power pack is too discharged. This can trigger spontaneous noises from the rig's operator.
Can be Confused with:	Noise 7 and noise 8

Noise 2: Moderately loud fan woosh that increases quickly but decreases slowly.

When heard:	whenever the Inverter is on or when the rig is connected to shore power and the Shore Power Charger is recharging the Power Pack.
From where:	in the KL, from the grille at the forward end of the passenger side bed next to the sliding door. in the GL, from the grilles on the forward and inboard sides of the dinette "hassock".
Source:	Inverter/Shore Power Charger/ATS module cooling fan
What's happening:	the Inverter and Shore Power Charger handle a lot of power and generate heat in the process. The Inverter will dissipate 200-250W at idle, so the cooling fan turns on shortly after the inverter is turned on. The fan responds to circuit temperature, so as power demands increase so will fan speed and airflow noise. It takes some time for the fan to slow and quiet down when inverter loads are removed. The Shore Power Charger uses the same cooling fan as the Inverter. This

	component turns on when the rig is connected to shore power and the BMS decides that the Power Pack needs charging. This can happen at any time, because all 12V DC loads in the rig are supplied by the power pack, even when connected to shore power.
User Controls:	the fan operates completely under BMS control. Keep the inverter off when you're not using it, and minimize 12V DC loads to reduce drain on the power pack. Once the Shore Power Charger begins charging, it will stay on until the power pack is fully charged. If on shore power and the SOC gauge gets down to around 80%, expect the Shore Power Charger to kick in.
Can be confused with:	Noise 7 sometimes

Noise 3: Very faint fan whir that can rapidly change in tone.

When heard:	whenever the Pure 3 system is on, but really only when the rig is extremely quiet and you are right next to the emanation point.
From where:	in the KL, from the passenger side bathroom door pocket. in the GL, from the grilles on the forward and inboard sides of the dinette "hassock".
Source:	DC-DC converter
What's happening:	The DC-DC converter sources the 12V DC loads in the rig from the 48V DC of the power pack. Therefore the DC-DC converter is always on. As its loading varies, the converter's cooling fan will change speed quickly to follow.

Noise 4a: Faint moderate pitch fan whine.

When heard:	During sunny weather, especially when the coach interior is hot.
From where:	in the KL, from the passenger side bathroom door pocket or from the passenger side cabinet just forward of the pocket. in the GL, from the cabinet over the galley.
Source:	Solar Controller
What's happening:	The Solar Controller is heating up from processing a lot of solar power and/or the coach is hot inside. This happens rarely with the factory solar array, which uses only 1/3 of the Solar Controller's 600W capacity. If you have installed additional rooftop or portable solar panels the controller's cooling fan will actuate more often.
User Controls:	the Solar Controller operates completely under BMS control. It will operate only when the BMS determines that the Power Pack should accept charge.
Can be confused with:	Noise 1, the power pack fan. The Solar Controller fan will be loudest at head level and will be obvious when its cabinet door is opened; the Power Pack fan, at the grille at the head of the driver's side bed.

Noise 4b: Slow Clicking.

When heard:	occasionally when outside light levels are very low – typically in the early morning.
From where:	in the KL, from the passenger side bathroom door pocket or from the passenger side cabinet just forward of the pocket. in the GL, from the cabinet over the galley.
Source:	Solar Controller
What's happening:	The Solar Controller is searching for light to harvest from the solar panels. The clicking is the controller's input relay cycling as the controller periodically retries its search. You may or may not hear this sound. Clicking is more likely on 2019 models that have not had the Version 1.57 firmware upgrade, but varies from rig to rig.
User Controls:	none.

Noise 5 and 6: The sound of silence.

When heard:	never.
From where:	nowhere.
Source:	Alternator Control Module and Alternator
What's happening:	The Alternator Control Module (#5) operates silently, the alternator only when the engine is on, and since it's located in the engine compartment it can't be heard
User Controls:	none.

Noise 7: Low steady hum that goes for a while and then stops.

When heard:	more prevalent when coach temperature is higher
From where:	From the galley, though it can sound like it's coming from elsewhere.
Source:	Refrigerator
What's happening:	the refrigerator compressor is running.
User Controls:	Refrigerator temperature control knob.
Can be Confused with:	Noise 1 and noise 8

Noise 8: steady fan whoosh that can vary from gentle to more insistent.

When heard:	Whenever the the coach and or fresh water is being heated.
From where:	in the KL, from the grille at the forward end of the passenger side bed next to the sliding door. in the GL, from under the dinette seat.
Source:	Truma fan
What's happening:	The Truma has two fans – an air distribution fan and an intake/exhaust fan. The Air distribution fans have 3 distinct speeds: ECO, HIGH, and BOOST plus vent.
User Controls:	Dependent on what the user sets at the Truma control panel, but the Truma controller will adjust the fan speed to meet operational conditions and coach environment.
Can be confused with:	Noise 1 and noise 2

Change History

1.0 5/19/2020