Webasto

Feel the drive

Thomas BUILT BUSES®

TSL 17 Coolant Heater

Operating Instructions

Maintenance Instructions

Service Parts Listing

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Foreword

General Information

Dear Webasto Customer,
We assume that the workshop / service center that carried out the installation explained to you the operation and principle of functioning of your Webasto heater to your complete satisfaction. With these operating instructions we would like to provide you with an overview of the use of the TSL 17 coolant heater.

Safety and Information Symbols and their Meaning

WARNING!
This symbol is used to highlight that non-compliance with instructions or procedures can result in serious injuries or death to personnel.

CAUTION!
This symbol is used to highlight that non-compliance with instructions or procedures may cause damage to equipment.

ATTENTION
This symbol is used to highlight and draw specific attention to important information.

Maintenance and Safety Information – Read Before Operating the TSL 17 Heater!

The heater must be switched off:

Danger of explosion and asphyxiation!

- before entering filling stations and fuel depots.
- before entering locations where flammable vapors or dust may accumulate (e.g. in the vicinity of fuel, coal, sawdust or grain depots). Do not operate heater over dry grass or other dry ground cover.
- before entering enclosed spaces (e.g. garages). This should also be considered when pre-setting heater operating times with the optional timer.

The heater must not be:

- exposed to temperatures greater than 120° C (storage temperature). Exposure to such temperatures may cause damage to the electronic components.
- operated without a minimum level of 20% of good quality antifreeze in the water of the heating circuit.

Maintenance and Safety Information – Continued

The heater must:

- be operated with the fuel specified on the nameplate.
- In the case of a severe build-up of smoke, unusual combustion noises or fuel smell, the heater is to be put out of operation by removing the fuse and may only be restarted after it has been inspected by qualified personnel.
- be operated at least once a month for 10 minutes, with the vehicle engine cold. The heater should be checked annually by a qualified expert, preferably prior to the heating season commencing.

Liability claims:

- Webasto will not assume any liability if the installation instructions and the notes contained therein are not observed. The same applies to improperly performed repairs or those where other than genuine replacement parts have been used. In those cases, the heater's General Design Certification will be invalidated as a consequence.
- Claims can only be asserted if the claimant can prove that the maintenance and safety notes were adhered to.

The Webasto TSL 17 (Thermo Top C) Coolant Heater - Overview

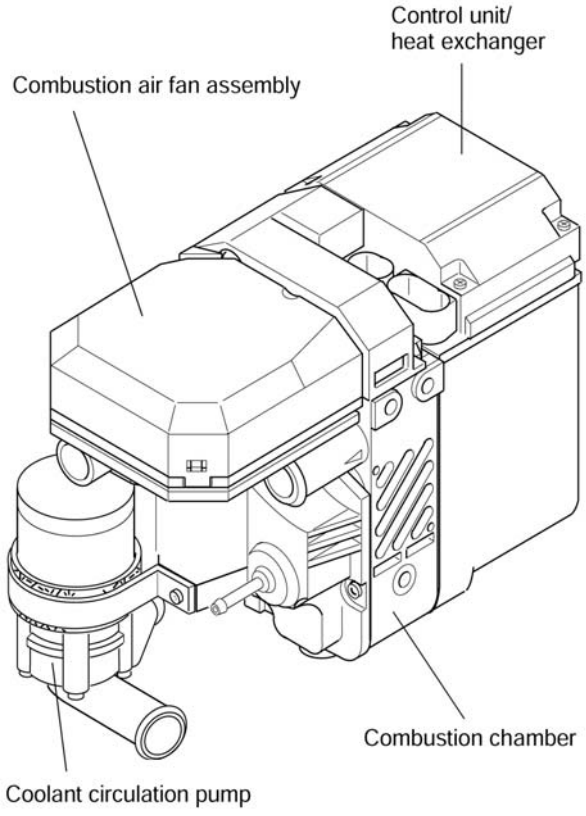


Figure 1. TSL 17 (Thermo Top C) Coolant Heater

Operating the Webasto Coolant Heater

Before switching on the Webasto TSL 17, review the following procedures on the proper operating techniques to ensure a comfortable interior. The Webasto can be activated either by a supplied ON / OFF rocker switch, or optional 7 Day Digital Timer.

Heater Activation with the Standard Equipped Rocker Switch

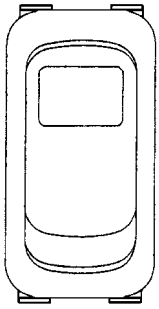


Figure 2. Standard Equipped Rocker Switch

The TSL 17 heater is activated by depressing the rocker switch to the 'ON' position. Once switched on, the heater begins operation and shortly thereafter, heated coolant is circulated through the engine's coolant system.

ATTENTION
The heater will not operate using the rocker switch unless the vehicle's ignition key is switched to the 'ACCESSORIES' position for preheat (engine not running) or 'IGNITION' position (engine running) for boost heating.

Heater Deactivation

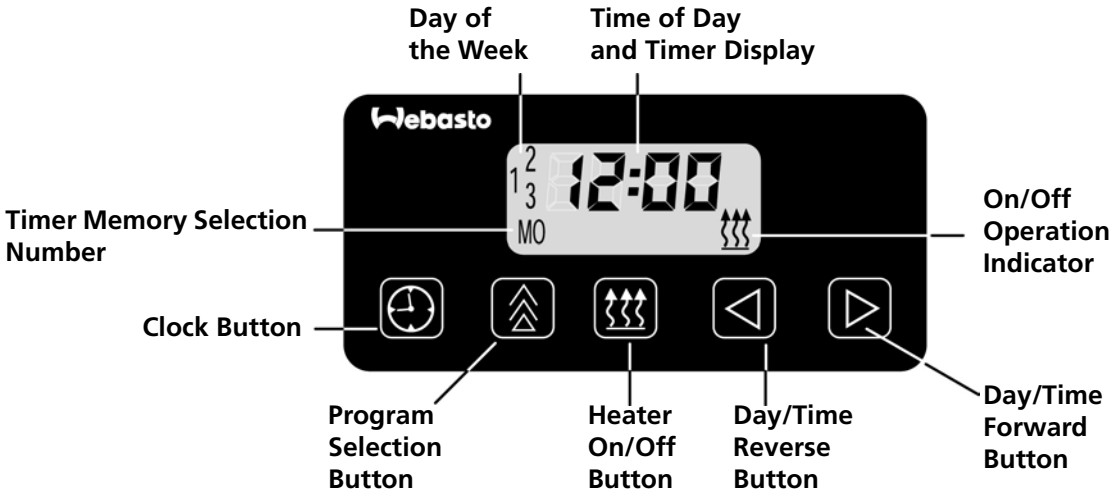
Manually:
By returning the rocker switch to the 'OFF' position or, if the optional timer is installed, by pressing the "Heater On/Off Button" on the timer (see timer operating instructions on next page). The heater can be switched off at any time during operation.

Automatically:
Whenever the ignition key is switched off, the heater will also shut-down. If the optional timer is installed, the heater will be switched off automatically once the timer reaches the end of a timed cycle (preheat mode) or whenever the ignition is switched off while the heater is running (boost heat mode).
In all cases, whenever the heater is turned off, it will immediately begin a brief cool-down period. The cool-down period allows the heater to burn off any residual fuel and purge the combustion chamber with cool air.

ATTENTION
The heater will automatically shut-down anytime the ignition key is switched to the 'OFF' position. This prevents the heater from being unintentionally left on for extended periods and possibly discharging the vehicle batteries.

WARNING!
To avoid the possibility of fire or explosion causing injury or death, the Webasto heater MUST be switched off before entering fueling stations, during refueling or entering areas where flammable or explosive materials, gases, fumes or dusts are present.

Operating the Coolant Heater with the OPTIONAL 7-Day Digital Timer



Setting the Time and Day of the Week	
1	Press and hold for 2 seconds. Time of day will start flashing.
2	Press Or to adjust time setting. Once time is set, release button. Flashing will stop after 5 seconds and day of the week will begin flashing.
3	Press Or to select the day of the week. Once set, wait for flashing to stop.

Operating the Heater in Manual Mode	
1	Press to activate the heater. The operation indicator will light up.
2	Press to deactivate the heater. The operation indicator will go out.

Programming Heater Starting Times	
1	Press to begin timer programming. The timer memory selection number starts flashing. Continue to press button until the desired memory selection number (1, 2 or 3) is visible.
2	Press Or to adjust heater start time setting. Once start time is set, release button. Flashing will stop after 5 seconds and day of the week will begin flashing.
3	Press Or to select day of the week. Once set, wait for flashing to stop. The heater will start on the time and day selected. To program the other two memory locations, repeat the above 3 steps for each location.

Recalling or Cancelling a Programmed Starting Times	
1	Press to cycle through the selection numbers. Any one of the three memory numbers can be activated each time the button is pressed. After selecting the memory number you desire, you can recall or change the day and time setting if desired be repeating steps 1, 2 and 3 under "Programming Heater Starting Times".
2	Press repeatedly until no memory location number is visible on the timer display.

Startup Sequence / Preheat Sequence with OPTIONAL Timer

To further ensure a warm and comfortable interior temperature, the following preheating and operational sequence is recommended:

1. Preheat the vehicles engine using ONLY the Webasto heater (Engine Off).

2. Start the vehicles engine.
   - DO NOT leave engine idling with all heater fans in the 'ON' position. Doing so will decrease the amount of heat available.

3. Start the driving route, leaving the Webasto heater in the 'ON' position.

ATTENTION
The Webasto heater has a start up and shut down procedure that takes several minutes to complete. Repeatedly turning the Webasto heater on and off will result in a malfunction, and can potentially damage the heater.

Technical Data and Information

Unless tolerances are shown within the technical data table, a tolerance of ± 10% applies at an ambient temperature of +20° C (+68° F) and at the rated voltage and conditions.

Heater	TSL 17 (Thermo Top C)
Mark of Approval:	~S 289
Design Type:	Coolant heater with evaporator burner (Ferro-Tech Technology)
Heat Output Rating: - full load - part load	 5.0 kW (17,076 Btu/hr) 2.5 kW (8,538 Btu/hr)
Fuel	Diesel #1 Diesel #2 Arctic and Kerosene
Fuel Consumption: - full load - part load	 0.59 l/hr (0.155 US gal/hr) 0.30 l/hr (0.079 US gal/hr)
Rated Voltage:	12 Volts
Operating Voltage Range:	10.5... 15 Volts
Rated Power Consumption Without Circulating Pump: - full load - part load	 26 Watts (2.1 Amps) 18 Watts (1.5 Amps)
Maximum Permissible Ambient Temperature: Heater: - operation - storage Metering Pump: - operation	 -40°... + 60°C (-40°... +140°F) -40°... +120°C (-40°... +248°F) -40°... + 20°C (-40°... +68°F)
Maximum Allowable Working Pressure (Coolant System):	0.4... 2.5 Bar (5.8... 36 PSI)
Capacity of Heat Exchanger:	0.15 Liters (0.039 US gallons)
Min. Capacity of Coolant System:	4.0 Liters (1.0 US gallons)
Min. Volume of Flow:	250 l/hr (66 US gal/hr)
CO_2 Content in Exhaust Gas (operating range maximum)	8... 12.0 Vol.-%
Dimensions of Heater	Length 214 mm (8.42 in.) Width 106 mm (4.17 in.) Height 168 mm (6.61 in.)
Weight of Heater	2.9 kg (6.3 lb.)

Circulating Pump	Model U 4847
Volume Flow Against 0.1 Bar (1.45 PSI):	900 l/hr (237.75 gal/hr)
Rated Voltage:	12 Volts
Operating Voltage Range:	10.5... 15 Volts
Rated Power Consumption	14 Watts (1.16 Amps)
Dimensions of Circulating Pump:	L 95 mm X W 61 mm X H 61 mm (3.74 in. X 2.4 in. X 2.4 in.)
Weight of Heater	0.3 kg (0.66 lb.)

Table 1: Technical Data

Electrical Components

Control unit, fan motor, fuel metering pump, digital timer and pencil-type glow pin are designed for 12-volt operation. The temperature limiter and flame detector are voltage-independent components

Fuel Requirements

The Diesel fuel recommended for use by the vehicle manufacturer is suitable as fuel for the heater. When changing to cold-resistant fuels, the heater must be operated for approximately 15 minutes to ensure that the fuel line and the fuel pump are also filled with the new type of fuel.
Any negative effect caused by fuel additives is not known. The addition of waste oil is not permitted.

Dimensions

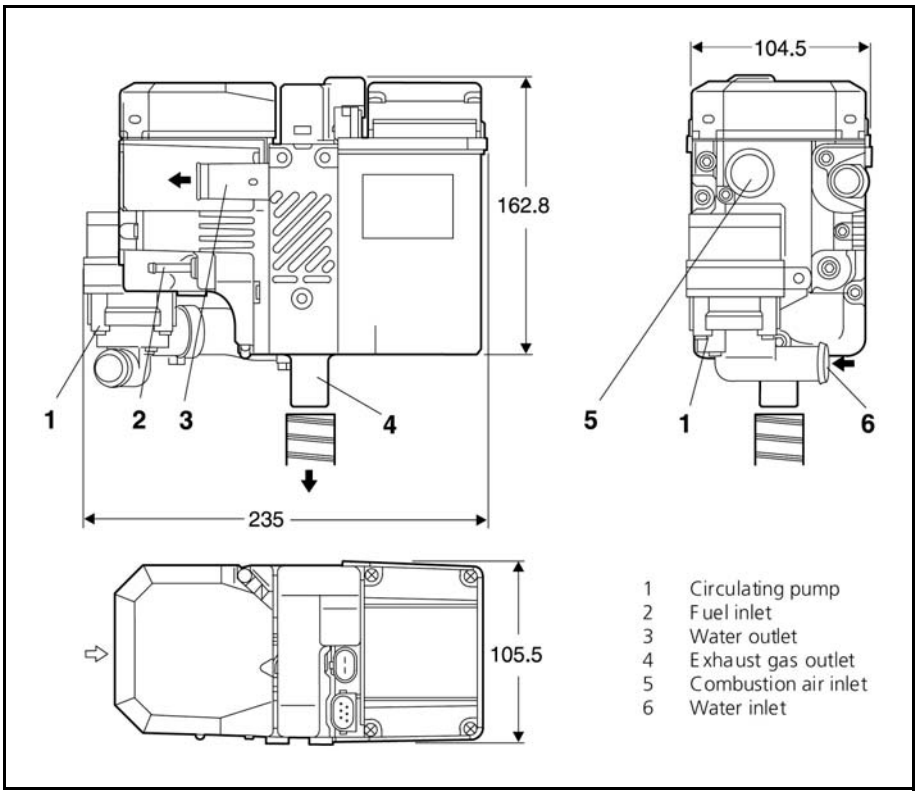


Figure 3. Heater Dimensions

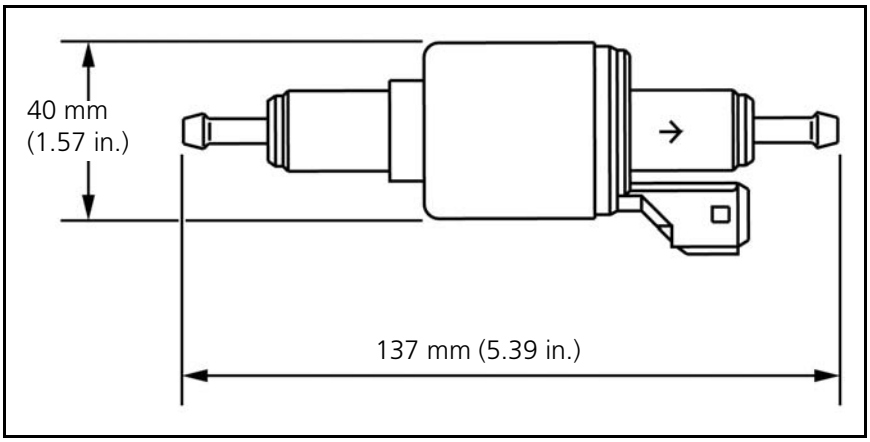


Figure 4. Fuel Pump Dimensions

ATTENTION
The fuel pump must be mounted horizontally (level) to operate properly.

Functional Description

Switch ON

Upon switching the heater on by the rocker switch or the optional timer, the ceramic igniter pin, the combustion air fan and the circulation pump are activated. After 30 seconds the fuel metering (dosing) pump starts operation and combustion air fan operation is suspended for 3 seconds.
Subsequently the combustion air fan speed is increased in two ramps within 56 seconds to nearly full load operation.
After a stabilization phase (constant speed) of 15 seconds the combustion air fan speed is again increased in a ramp within 50 seconds to nearly full load.
After reaching full load fuel delivery, the ceramic igniter pin is deactivated and the combustion air fan operation is increased to full load.
During the subsequent 45 seconds as well as in normal operation the ceramic igniter pin functions as a flame sensor to monitor the flame condition.
Once all these events are completed, the heater begins the automatically controlled heating period of operation.
In case of a no flame condition or a flameout, a restart is automatically initiated. If the no flame condition persists, fuel delivery is stopped and the heater enters an error lockout with a cool-down of the combustion air fan.
A flameout during normal combustion operation causes an automatic restart.

Heating Operation

When the temperature rises to reach 161° F (72° C) the heater switches to the energy saving part load operation.
A further rise in temperature up to 171° F (77° C) causes the heater to enter a control idle period. This also happens when exceeding a total heating operating time of 76 minutes.
The circulation pump and the operation indicator light (if equipped) remain on during control idle.
After cool-down of the coolant to 160° F (71° C) the heater resumes part load operation. Another rise in temperature to 171° F (77° C) causes the heater to enter again the control idle period. A drop in the coolant temperature during part load operation due to an increased demand in heat will cause the heater to switch to full load operation at 133° F (56° C).
Should the coolant temperature however not drop within 15 minutes during the control idle period to below 160° F (71° C), a subsequent drop in the coolant temperature below 160° F (71° C) causes the heater to perform a regular starting sequence into full load operation.

Switch Off

When turning the heater off the combustion process terminates and cool-down commences. The circulation pump and the combustion air fan first continue operation to cool the heater down (cool-down) to be automatically switched off afterwards.

NOTE
The cool-down time and the combustion air fan speed depend on the heater operating condition at the time of deactivation. Cool-down time is 175 seconds when deactivated in full load operation and 100 seconds when deactivated in part load operation. Dependent on the software variant implemented in the control unit there might be deviations from those cool-down periods.

Annual Maintenance

General Information

The TSL 17 coolant heater requires a minimum of maintenance to keep it in good operating condition. The following maintenance procedures should be performed annually before each heating season:

Heater

– Clean the heater of any accumulated debris or dust with compressed air.

– Inspect all components for wear and damage. Repair or replace worn and damaged components.

Electrical System

– Check wiring harnesses for damage, repair or replace damaged wiring.

– Check the condition of the batteries and the connections.

– Load test the batteries and replace if necessary.

Combustion Air System

– Check for obstructions at air intake port.

– Check air intake tube carefully for restrictions and damage. Repair or replace if damaged.

Exhaust System

– Check the exhaust system carefully for restrictions or corrosion. Repair or replace if damaged.

Fuel System

– Change fuel filter once a year preferably before the heating season. Inspect fuel line for damage, restrictions, routing or loose connections. Repair or replace if damaged.

Coolant System

– Inspect all coolant lines and clamps for leakage, restrictions or damage. Repair or replace.

– Inspect coolant circulation pump for leakage. Repair or replace if leaking or damaged.

Operational Test

– Run your heating system for at least 15 minutes.

– Check water and fuel connections for leakage. Re-tighten hose clamps if necessary.

ATTENTION
The heater will not function properly with defective or discharged batteries.

ATTENTION
Operate the Webasto TSL 17 coolant heater at least once a month for 15 minutes to keep it in optimal operating condition.

Basic Troubleshooting

General Information

This section describes basic troubleshooting procedures for the TSL 17 coolant heater. Troubleshooting is normally limited to the isolation of defective components. For more in depth troubleshooting, servicing and repair of the heater, refer to the Workshop Handbook available from Webasto Product N.A., Inc.

CAUTION!
Troubleshooting requires profound knowledge about structure and theory of operation of the heater components and should only be performed by trained personnel familiar with Webasto heating systems.

Before troubleshooting, check for and eliminate the following for possible causes of a malfunction:

- blown fuses
- fuel supply (plugged fuel filter)
- corroded battery terminals, electrical wiring, connections and fuses
- loose contacts at connections and connectors
- shut-down initiated by temperature limiter

NOTE
After any correction of a malfunction, a functional test has to be performed with the heater normally installed in the vehicle.

General Malfunction Table

The following table lists possible malfunctions, probable causes and remedies.

Malfunction	Probable Cause	Remedy
Coolant heater switches off unexpectedly (Fault lockout)	No combustion after start or automatic restart	Switch off heater momentarily and switch on once again
	Flame extinguishes during operation	Switch off heater momentarily and switch on once again
	Heater overheats	Check for closed coolant circuit valves, obstructed coolant lines. Check coolant level. Allow heater to cool down. Switch off heater momentarily and switch on once again. Should heater fail to activate, see "Heater Lockout Reset Procedure" on following page.
	Vehicle electrical system voltage too low	Charge battery Switch off heater momentarily and switch on once again
Heater expels black smoke from exhaust	Combustion air and/or exhaust tubing blocked	Check combustion and exhaust tubing for obstructions and clear

Heater Lockout Reset Procedure

The Webasto TSL 17 coolant heater is designed with a lockout safety feature built into the control unit. After 3 consecutive unsuccessful startup attempts, the heater will lock itself out from any further start attempts. The heater may also enter the lockout mode after experiencing an overheat condition.

1. Ensure switch or optional timer is in the "OFF" position. Turn switch or timer to the "On" position. Remove main fuse F1 (20 Amp), reinsert after 5 seconds.
2. Cycle switch or timer off and then back on once more. Remove fuse F1 once again and reinsert after 5 seconds. Heater should attempt to start after inserting fuse.

NOTE
Coolant temperature must be below the lower threshold before heater will attempt to start.

PC Diagnostics Kit

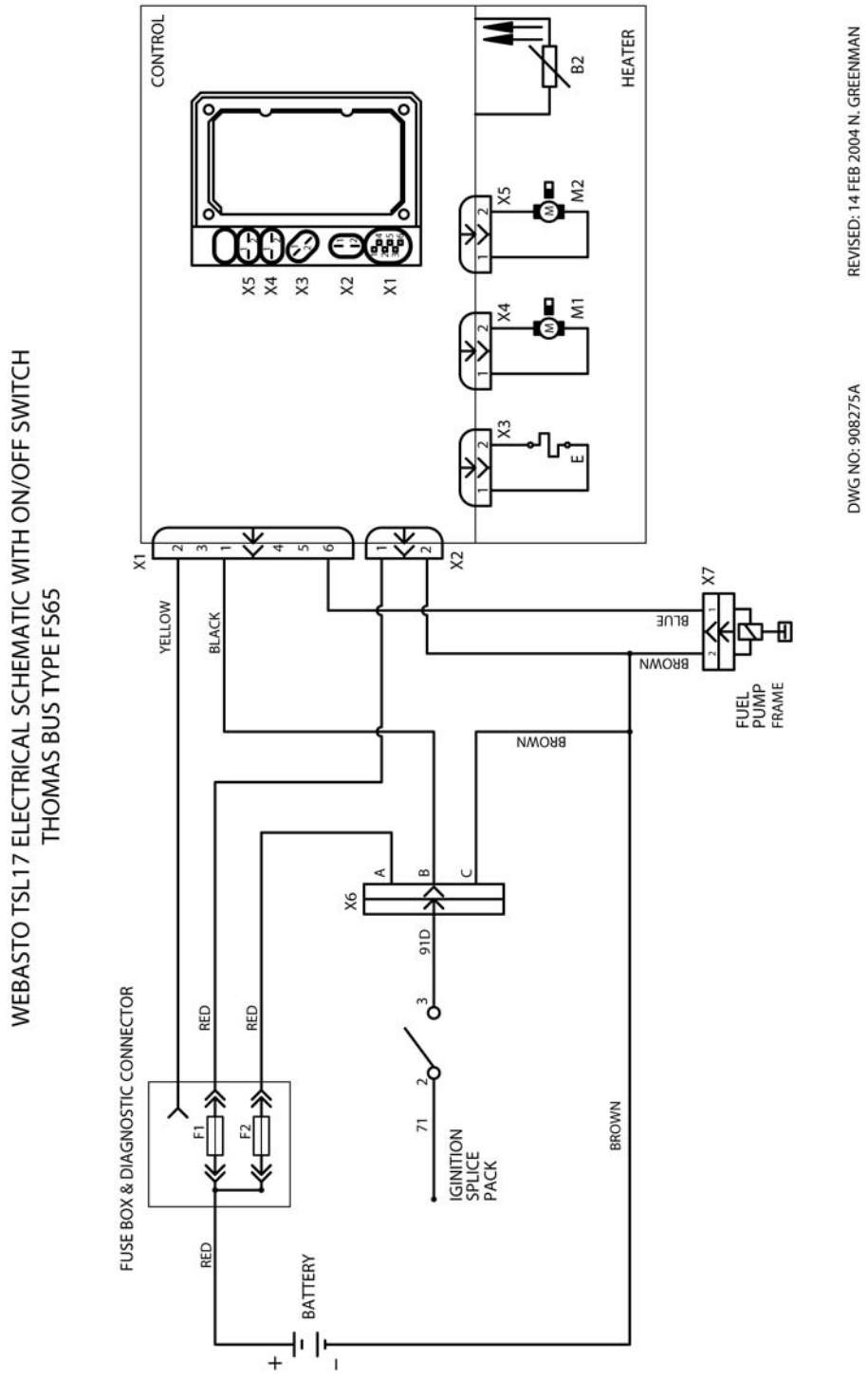
It is possible to read and remove (reset) stored malfunction codes from the TSL 17's internal memory.
This is achieved through the use of a diagnostic interface kit connected to the TSL 17 and a PC computer with Microsoft Windows operating system and the PC Diagnostic software loaded.

The PC Diagnostic Interface Kit comes complete with connecting hardware including software and user's guide on compact disc. Order PC Diagnostics Kit under part number 1301728B.

Kit includes the required adapter for the TSL 17, Thermo Top C/Z and Air Top 2000 heaters. More adapters are available for other Webasto heaters with internal diagnostic capabilities.

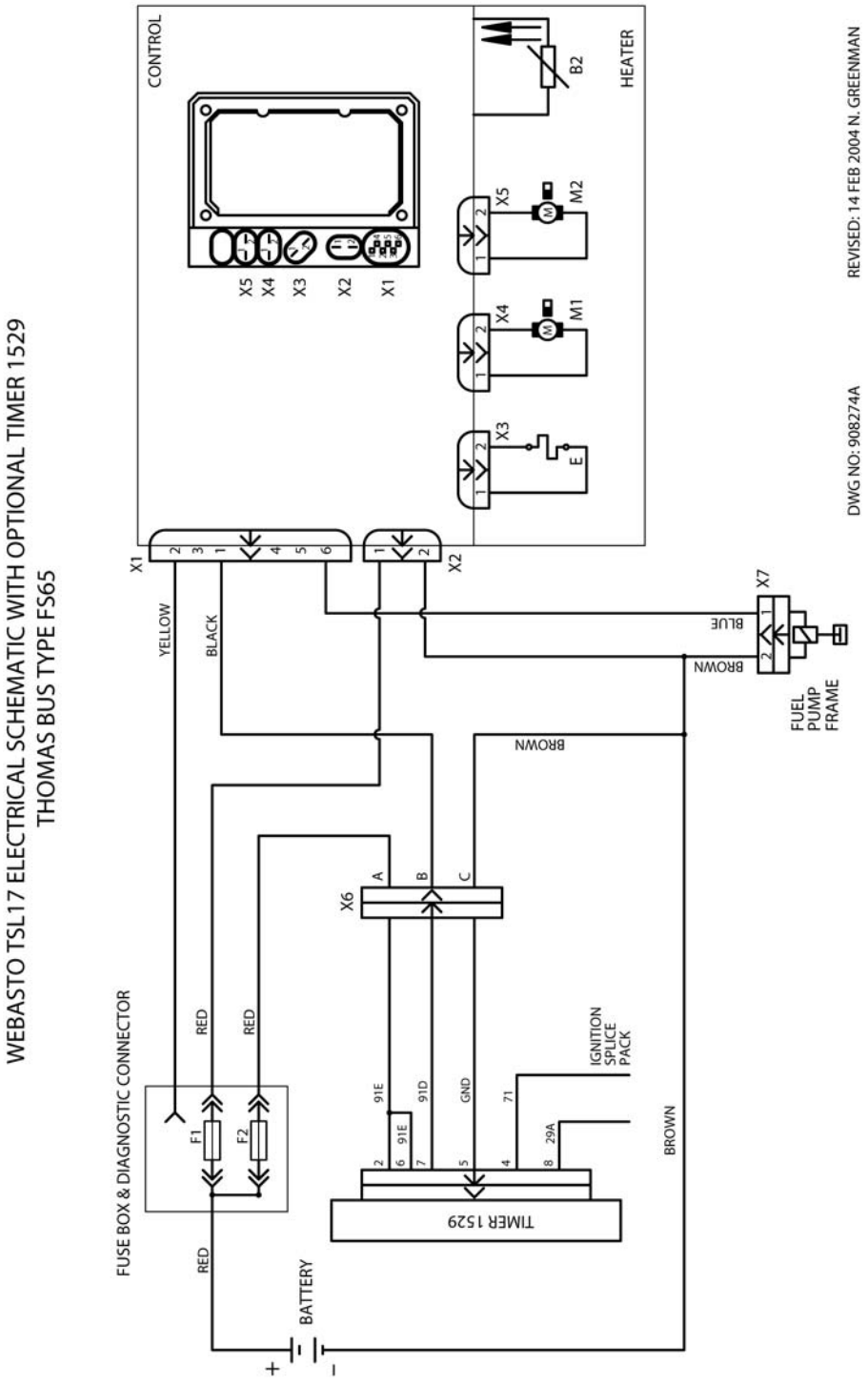
In addition to working with stored malfunction codes, the PC Diagnostics Kit allows you to do several other functions such as reading values while the heater is in operation or testing individual components.
Print out capability of malfunction codes and heater data is also provided (user supplied printer required).

For further capabilities and instructions for use with the TSL 17 heater, refer to the user's guide on compact disc supplied with the PC Diagnostics Kit.



B2	Temperature Sensor	X2	Connector 2–Way
E	Ceramic Igniter/Flame Sensor	X3	Connector 2–Way
F1	20A Fuse	X4	Connector 2–Way
F2	2A Fuse	X5	Connector 2–Way
M1	Combustion Air Fan	X6	Connector 3–Way
M2	Coolant Circulation Pump	X7	Connector 2–Way
X1	Connector 6–Way		

Figure 5.



B2 Temperature Sensor
E Ceramic Igniter/Flame Sensor
F1 20A Fuse
F2 2A Fuse
M1 Combustion Air Fan
M2 Coolant Circulation Pump
X1 Connector 6–Way
X2 Connector 2–Way
X3 Connector 2–Way
X4 Connector 2–Way
X5 Connector 2–Way
X6 Connector 3–Way
X7 Connector 2–Way

Figure 6.

Contents / Table des matières TSL 17 (12 Volt, Diesel)

Topic / Matière

For additional accesssory parts refer to the accessories catalogue.
Pour d'autres accessoires consulter le catalogue d'accessoires.

For replacement heater see / Pour le réchauffeur de rechange voyez:

Column A/N: Indicates which parts are modified, which parts are new:
A = modification N = new part

Column Description: Sub-assemblies or components (marked by a point) - offset to the right - are contained in the assembly which is offset one point less.

Example:
fuel pump = assembly
• solenoid valve = sub-assembly
• • gasket = component

The parts dependent on voltage are marked: 12 Volt with red label or dot
24 Volt with green label or dot

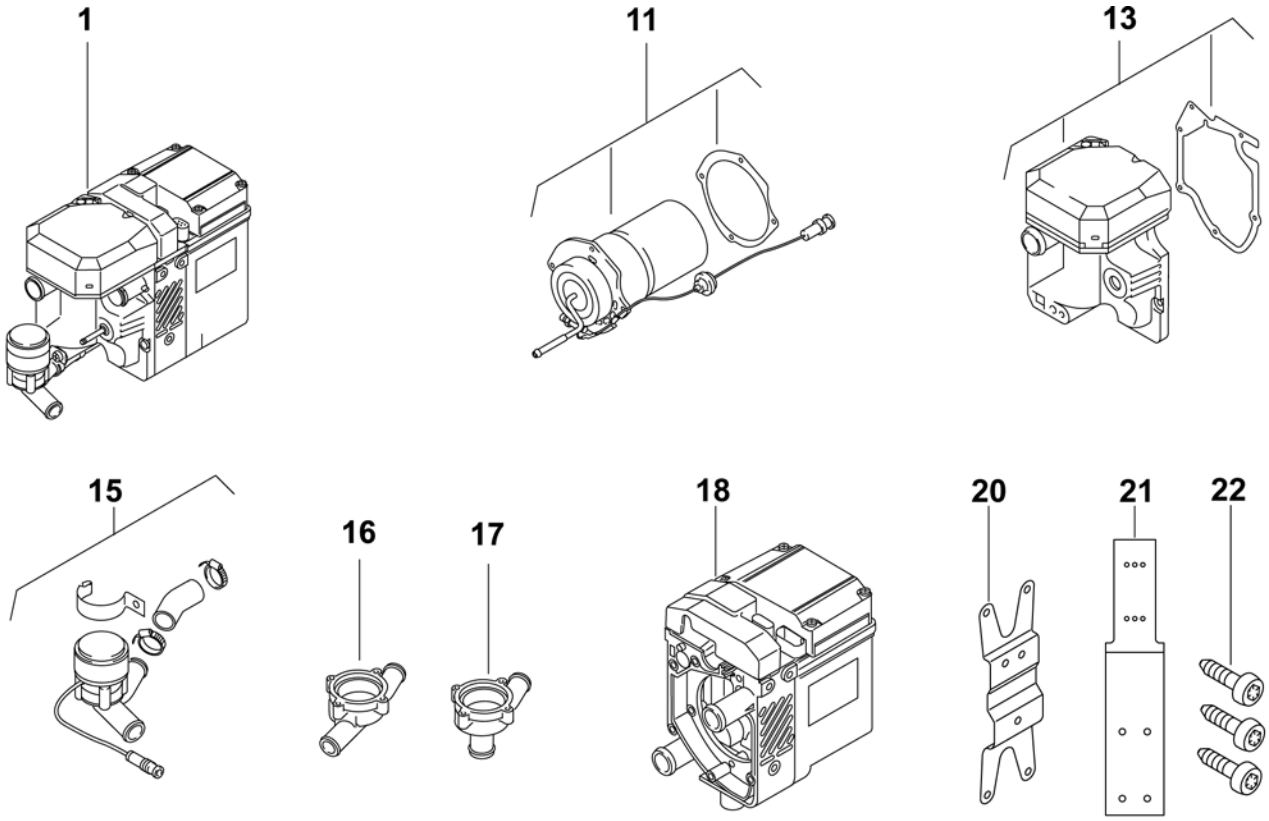
Séparation A/N: Afin de mettre en évidence les nouvelles pièces et les pièces transformées, vous trouverez le repère suivant:
A = transformation N = nouvelles pièces

Désignation abrégée: Les sous-ensembles marqués par points sont inclus dans les pièces les précédant et étant précédés d'un nombre de points inférieurs ou d'aucun point.

Exemple:
pompe à combustible = pièce principale
• électrovanne = sous-ensemble inclus dans la pompe à combustible
• • joint torique = inclus dans l'électrovanne

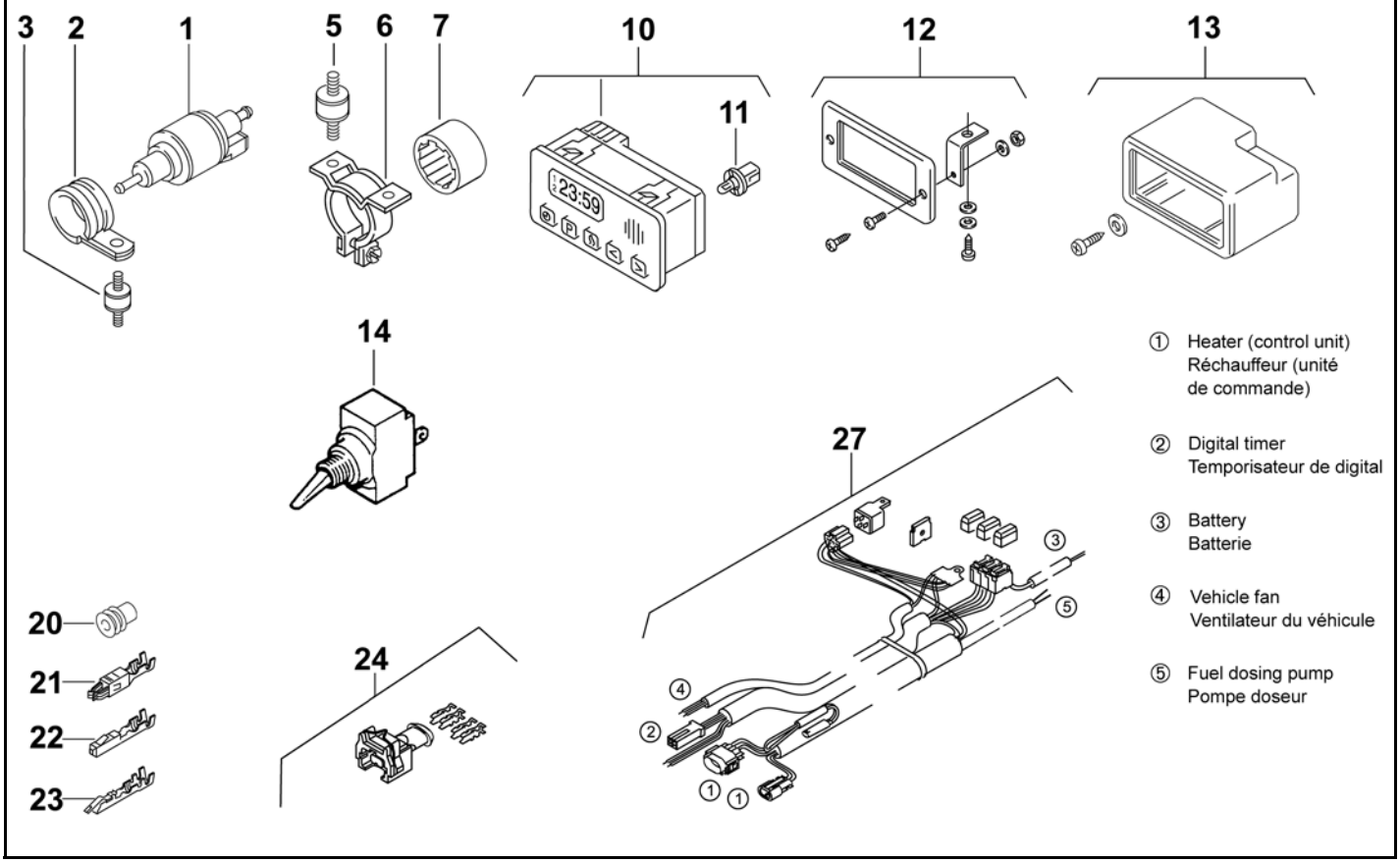
Pièces différentes selon tension 12 ou 24 volts: 12 volts avec inscription rouge ou point rouge
24 volts avec inscription verte ou point vert

TSL 17 (12 Volt, Diesel) - fig. 1



Item Repére	Quantity Nombre **TSL 17**	Part No. Référence	A/N	Description Désignation	Remarks Remarques
TSL 17 - 12 Volt, Diesel Heaters / Réchauffeur					
1	1	89073K		TSL 17 - 12 V, Diesel replacement heater réchauffeur de rechange	
2-10					
Parts for heater / Pièces pour le réchauffeur					
11	1	92995C		burner (Diesel) 12 V brûleur (Gas-oil) 12 V	with screws and gaskets / avec vis et joints
12					
13	1	9001383A		combustion air fan 12 V turbine d'air 12 V	
14					
15	1	93008A		circulation pump U 4847 - 12 V pompe de circulation U 4847 - 12 V	with seals and screws / avec pièces d'étanchéité et vis
16	1	93011C		pump housing 193° Corps de pompe 193°	for / pour U 4847
17	1	93012C		pump housing axial Corps de pompe axial	for / pour U 4847
18	1	92998E		burner head + heat exchanger + control unit tête de brûleur + échangeur de chaleur + boîtier de commande	
19					
20	1	87394B		universal mounting plate plat de support universel	
21	1	901088		mounting plate - heavy duty truck applications plat de support - applications résistantes de camion	
22	3	86889B		screw - EJOT PT 10 DG 60 x 18 vis - EJOT PT 10 DG 60 x 18	for fastening bracket to heater / pour le support d'attache au réchauffeur

TSL 17 (12 Volt, Diesel) - fig. 2

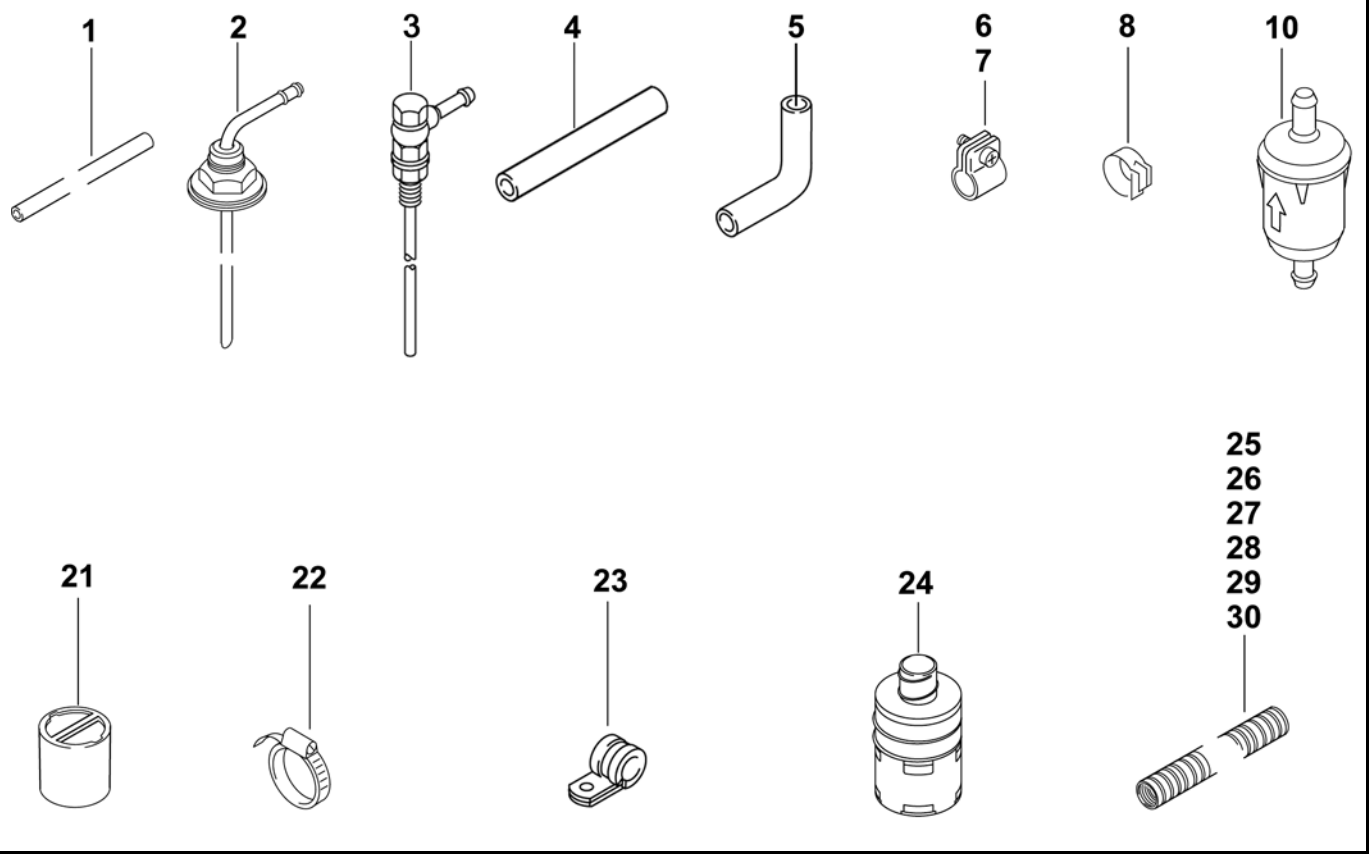


Item Repére	Quantity/ Nombre **TSL 17**	Part No. Référence	A/N	Description Désignation	Remarks Remarques
Electrical parts / Piéces électriques					
1	1	89372A	A	dosing pump - DP 30 12 V pompe doseur- DP 30 12 V	
2	1	21499A		clamp Ø 35mm collier de fixation Ø 35mm	
3	1	462543		rubber anti-vibration mount silentbloc en caoutchouc	
4					
5	1	462543		rubber anti-vibration mount M6 silentbloc en caoutchouc M6	alternatives for item 3 facultativement pour rep. 3
6	1	255149		clamp collier de serrage	
7	1	131320		rubber mounting couche intermédiaire	
8-9					
10	1	906108A		timer - 1531 12 V temporisateur - 1531 12 V	3 preset times 3 temps préaffichés
11	1	90807A		• light bulb 12 V • lampe 12 V	
12	1	474630		mounting kit (digital timer) cadre avec support	
13	1	475866		mounting case habillage de montre	
14	1	905103		toggle switch 12 V, illuminated interrupteur à levier 12 V, illuminé	with On/Off plate avec le plat "Marche/Arrêt"
15-19					

Item Repére	Quantity/ Nombre **TSL 17**	Part No. Référence	A/N	Description Désignation	Remarks Remarques
20	X	32099A		silicone seal joint de silicone	
21	X	84346A		flat spring contact 2.8 contact à ressort à lame 2.8	
22	X	84348A		jack 0.75 contact à douille 0.75	
23	X	24990A		receptacle cosse femelle	for digital timer connector / pour fiche d'horloge
24	1	5000756A		plug connector 2 pole, 2.8 douille à cosses femelles 2 poteau, 2.8	metering pump pompe de dosage
25-26					
27	1	5000524A		wiring harness - Thomas Bus faisceau des câbles - Thomas Bus	Thomas Bus - replacement part Autobus de Thomas - pièce de rechange

X = Quantity as required / Nombre suivant les besoins

TSL 17 (12 Volt, Diesel) - fig. 3

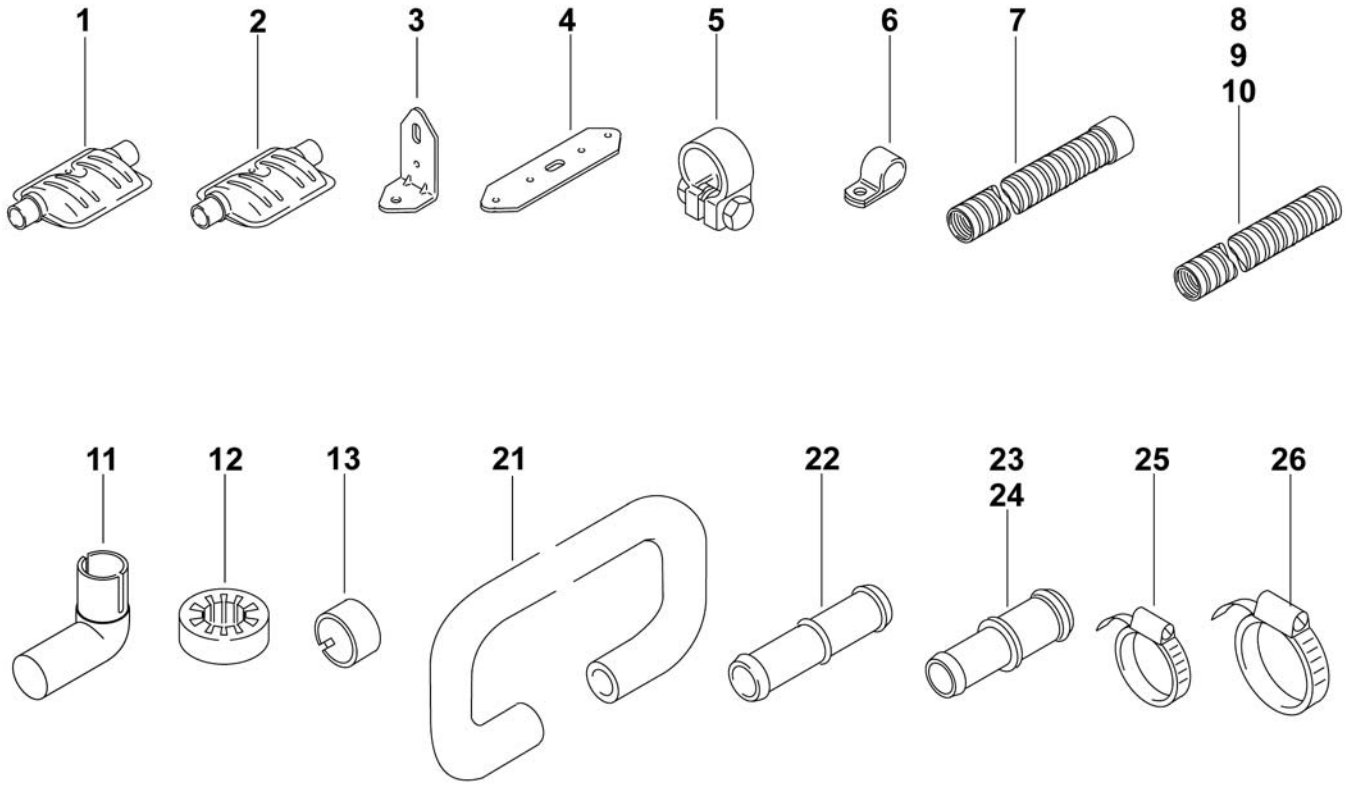


Item Repére	Quantity/ Nombre **TSL 17**	Part No. Référence	A/N	Description Désignation	Remarks Remarques
Parts for fuel supply / Pièces afférentes au alimentation en combustible					
1	X	50483931A		fuel line id.Ø 2 x od.Ø 5 mm tuyau de combustible di.Ø 2 x de.Ø 5 mm	per meter au Métre
2	1	903200A		fuel standpipe Ø 5.5 mm dispositif de prise, réservoir Ø 5.5 mm	alternate part 35320A article alternatif 35320A
3	1	5000553A		fuel standpipe Ø 5.5 mm dispositif de prise, réservoir Ø 5.5 mm	
4	5	50484032B		fuel line connector id.Ø 4.5 mm x 50 mm lg. tuyau de combustible connecteur di.Ø 4.5 mm x 50 mm lg.	
5	X	34859B		fuel line connector - 90° id.Ø 4.5 mm tuyau de combustible connecteur - 90° di.Ø 4.5 mm	
6	10	330027		hose clamp Ø 10 mm collier de serrage Ø 10 mm	
7	X	379670		hose clamp Ø 12 mm pince pour tuyau flexible Ø 12 mm	
8	X	463949		hose clamp Ø 10 mm collier de serrage Ø 10 mm	
9					
10	1	50487171A		fuel filter filtre de combustible	
11-20					
Parts for combustion air system / Pièces afférentes au système d'air comburant					
21	1	29516B		protecting cap Ø 27 mm capot de protection Ø 27 mm	

Item Repére	Quantity/ Nombre **TSL 17**	Part No. Référence	A/N	Description Désignation		Remarks Remarques
22	X	243744		hose clamp pince pour tuyau flexible	Ø 20 - 27 mm Ø 20 - 27 mm	
23	X	362891		pipe clip collier de fixation	Ø 29 Ø 29	
24	1	66113A		air intake silencer silencieux d'aspiration d'air		
25	1	5023298A		flexible pipe PAP tuyau flexible	Ø 22 mm x 500 mm Ø 22 mm x 500 mm	combustion tubing - Thomas Bus tuyauterie de combustion - Thomas Bus
26	1	5000641A		flexible pipe AA tuyau flexible	Ø 22 mm x 450 mm Ø 22 mm x 450 mm	combustion tubing tuyauterie de combustion
27	1	5000642A		flexible pipe AA tuyau flexible	Ø 22 mm x 500 mm Ø 22 mm x 500 mm	combustion tubing tuyauterie de combustion
28	1	5000643A		flexible pipe AA tuyau flexible	Ø 22 mm x 1 m Ø 22 mm x 1 m	combustion tubing tuyauterie de combustion
29	1	5000644A		flexible pipe AA tuyau flexible	Ø 22 mm x 1.5 m Ø 22 mm x 1.5 m	combustion tubing tuyauterie de combustion
30	X	5000645A		flexible pipe AA tuyau flexible	Ø 22 mm x 5 m Ø 22 mm x 5 m	combustion tubing tuyauterie de combustion

X = Quantity as required / Nombre suivant les besoins

TSL 17 (12 Volt, Diesel) - fig. 4

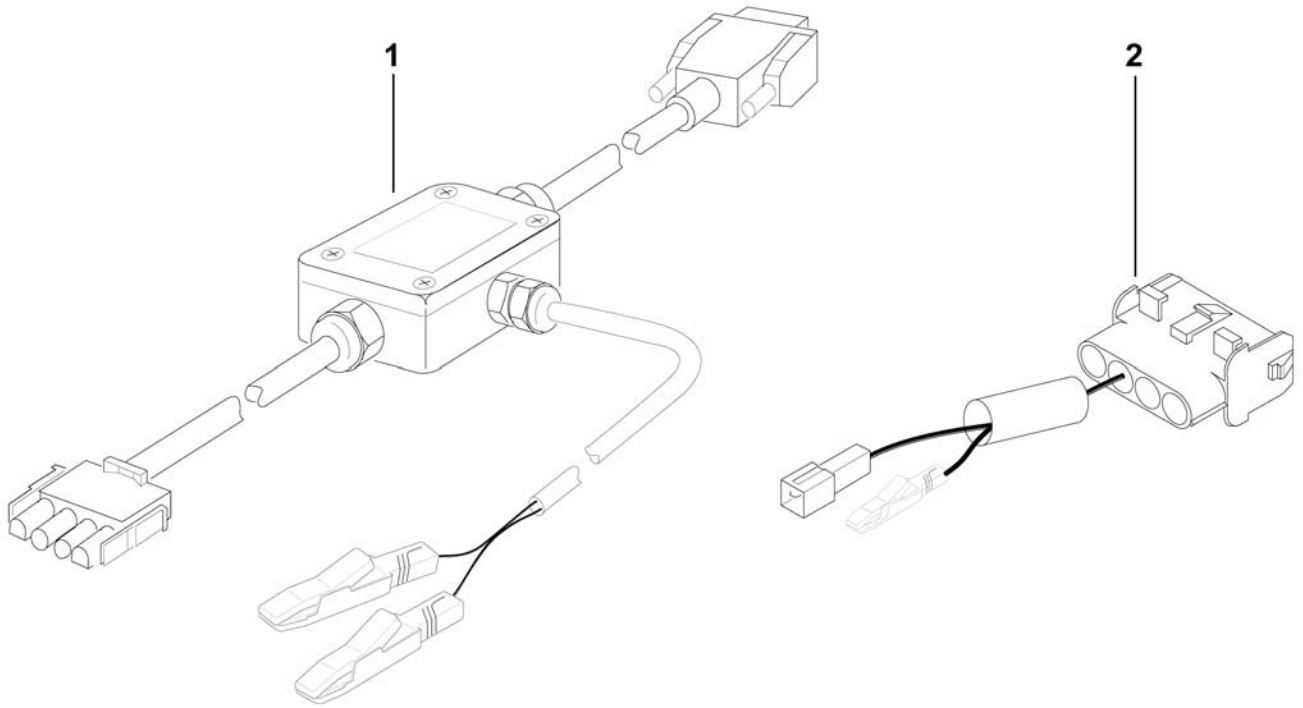


Item Repére	Quantity/ Nombre **TSL 17**	Part No. Référence	A/N	Description Désignation	Remarks Remarques
Parts for exhaust system / Pièces afférentes au système d'échappement					
1	1	86450B		exhaust silencer Ø 22 mm silencieux d'echappement Ø 22 mm	rustproof antirouille
2	1	20844D		exhaust silencer Ø 22 mm silencieux d'echappement Ø 22 mm	
3	X	242780		angle bracket support équerre	
4	X	242888		mounting strip ruban de montage	
5	1	20965A		exhaust clamp Ø 24 - 26 mm bride d'échappement Ø 24 - 26 mm	
6	X	405256		pipe clip Ø 25 mm collier de serrage Ø 25 mm	
7	1	50900126A		flexible exhaust pipe, Ø 22 mm x 1 m, stainless steel with cap pipe d'échappement Ø 22 mm x 1 m, acier inoxydable flexible, avec capot	Thomas Bus - replacement part Autobus de Thomas - pièce de rechange
8	X	5000322A		flexible exhaust pipe Ø 22 mm x 5 m, stainless steel pipe d'échappement flexible Ø 22 mm x 5 m, acier inoxydable	
9	X	5000323A		flexible exhaust pipe Ø 22 mm x 10 m, stainless steel pipe d'échappement flexible Ø 22 mm x 10 m, acier inoxydable	
10	X	50337390A		flexible exhaust pipe Ø 22 mm x 20 m, stainless steel pipe d'échappement flexible Ø 22 mm x 20 m, acier inoxydable	
11	1	28472C		exhaust elbow Ø 22 mm coude d'échappement Ø 22 mm	
12	X	18137A		rubber ring (red) anneau caoutchouc (rouge)	

Item Repére	Quantity/ Nombre **TSL 17**	Part No. Référence	A/N	Description Désignation		Remarks Remarques
13	1	24048A		protection cap capot de protection	Ø 26.3 mm Ø 26.3 mm	
14-20						
Parts for heating water system / Pièces afférentes au système d'eau chaude						
21	X	50126840A		formed hose tuyau formé	Ø 20 mm x 2.2 m lg. Ø 20 mm x 2.2 m lg.	180° formed ends extrémités formées par 180°
22	X	66934B		hose connector connecteur de tuyau	20 x 20 mm 20 x 20 mm	
23		66908B		hose connector connecteur de tuyau	18 x 20 mm 18 x 20 mm	
24	2	900611		hose connector connecteur de tuyau	5/8" x 3/4" 5/8" x 3/4"	alternate item / article alternatif 66908B
25	X	901052		hose clamp pince pour tuyau flexible	Ø 19 - 27 mm Ø 19 - 27 mm	
26	X	901097		hose clamp pince pour tuyau flexible	Ø 23 - 32 mm Ø 23 - 32 mm	

X = Quantity as required / Nombre suivant les besoins

TSL 17 (12 Volt, Diesel) - fig. 5



Item Repére	Quantity Nombre **TSL 17**	Part No. Référence	A/N	Description Désignation	Remarks Remarques
Diagnostic Tools / Outils Diagnostiques					
1	1	9009064C		PC diagnosis diagnostic PC	includes software and adapter / inclut le logiciel et l'adapteur 92566B
2	1	92566B	A	test adapter examinez l'adapteur	
no fig.	1	63378A		workshop manual - English Thermo Z/C / TSL 17 manuel d'atelier - l'anglais Thermo Z/C / TSL 17	available at www.techwebasto.com disponible à www.techwebasto.com
no fig.	1	907636		troubleshooting guide guide de dépannage	available at www.techwebasto.com disponible à www.techwebasto.com

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