BOMAG
FAYAT GROUP

Service Manual

BF 700 C-2

S/N 821 892 12 1001>

Asphalt paver

008 400 20 EN

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1 General

1.1 Introduction Service Manual

General

This manual:

- addresses the BOMAG Customer Service and professionally trained personnel.
- provides support for repair work or maintenance procedures on the machine.

This manual described the deinstallation, dismantling , assembly, installation as well as the repair of components and assembly groups as far as this makes sense with respect to tools and spare parts supply.

Documentation

For the BOMAG machines described in this manual the following documentation is additionally available:

- Operating and maintenance instructions
- Spare parts catalogue
- Service information (if necessary)

Genuine BOMAG spare parts

Use only genuine BOMAG spare parts.

Spare parts needed for repairs can be taken from the spare parts catalogue for the machine.

Updating service

This manual is not subject of an updating service. For this reason we would like to draw your attention to the additionally published service informations.

In case of a new release all necessary changes will be included.

In the course of technical development we reserve the right for technical modifications without prior notification.

Copyright

DANGER!

Danger to life when disregarding the safety regulations!

– Strictly follow the safety regulations in this instruction manual.

1.2 Concerning your safety

1.2.1 Safety regulations and environmental protection regulations when handling fuels and lubricants

1.2.1.1 Preliminary remarks

The operating company must ensure that all professional users have read and follow the corresponding safety data sheets for the individual fuels and lubricants.

Safety data sheets provide valuable information about the following characteristics:

- Designation of the substance
- Possible dangers
- Composition / information about constituents
- First-Aid measures
- Fire fighting measures
- Measures in case of accidental release
- Handling and storage
- Limitation and monitoring of exposure / personal protective equipment
- physical and chemical properties
- Stability and reactivity
- Toxicological data
- Environmental data
- Notes on waste disposal
- Information on transport
- Legislation
- other data

1.2.1.2 Safety regulations and environmental protection regulations for handling diesel fuel

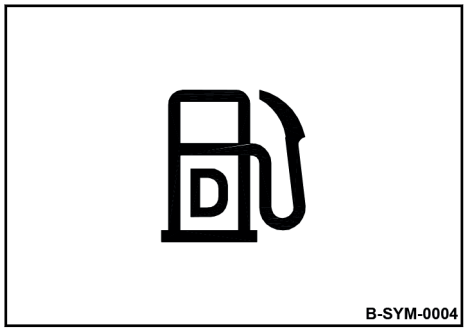

Fig. 1

WARNING!

Danger of burning by ignited diesel fuel!

– Do not allow diesel fuel to come into contact with hot components.
– Smoking and open fire is prohibited!
– Wear your personal protective outfit (protective gloves, protective clothing).

CAUTION!

Health hazard caused by contact with diesel fuel!

– Wear your personal protective outfit (protective gloves, protective clothing).
– Do not inhale any fuel fumes.
– Avoid contact.

CAUTION!

Danger of slipping on spilled diesel fuel!

– Immediately bind spilled diesel fuel with an oil-binding agent.

ENVIRONMENT!

Diesel fuel is an environmentally hazardous substance

– Always keep diesel fuel in proper containers.
– Immediately bind spilled diesel fuel with an oil-binding agent.
– Dispose of diesel fuel and fuel filters according to regulations.

1.2.1.3 Safety regulations and environmental protection regulations for handling oil

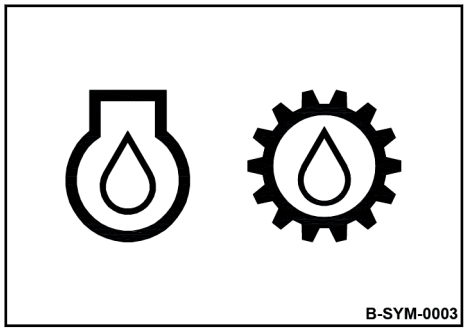

Fig. 2

WARNING!

Danger of burning by ignited oil!

– Do not allow oil to come into contact with hot components.
– Smoking and open fire is prohibited!
– Wear your personal protective outfit (protective gloves, protective clothing).

CAUTION!

Health hazard caused by contact with oil!

– Wear your personal protective outfit (protective gloves, protective clothing).
– Do not inhale any oil vapours.
– Avoid contact.

CAUTION!

Danger of slipping on spilled oil!

– Immediately bind spilled oil with an oil-binding agent.

ENVIRONMENT!

Oil is an environmentally hazardous substance

– Always keep oil in proper containers.
– Immediately bind spilled oil with an oil-binding agent.
– Dispose of oil and oil filter according to regulations.

1.2.1.4 Safety regulations and environmental protection regulations for handling hydraulic oil

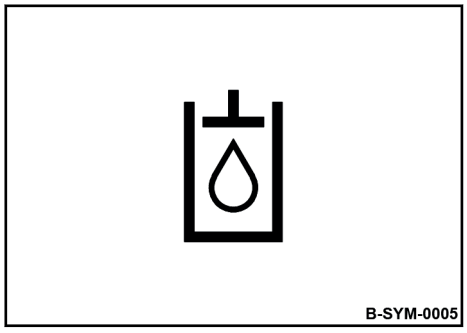

Fig. 3

WARNING!

Danger of injury caused by escaping pressure fluid!

– Always depressurize the hydraulic system before starting work in the hydraulic system.
– Wear your personal protective outfit (protective gloves, protective clothing, goggles).

Should pressure fluid penetrate the skin, immediate medical help is required.

WARNING!

Danger of burning by ignited hydraulic oil!

– Do not allow hydraulic oil to come into contact with hot components.
– Smoking and open fire is prohibited!
– Wear your personal protective outfit (protective gloves, protective clothing).

CAUTION!

Health hazard caused by contact with hydraulic oil!

– Wear your personal protective outfit (protective gloves, protective clothing).
– Do not inhale any oil vapours.
– Avoid contact.

CAUTION!

Danger of slipping on spilled oil!

– Immediately bind spilled oil with an oil-binding agent.

ENVIRONMENT!

Oil is an environmentally hazardous substance

– Always keep oil in proper containers.
– Immediately bind spilled oil with an oil-binding agent.
– Dispose of oil and oil filter according to regulations.

1.2.1.5 Safety regulations and environmental protection regulations for handling coolants

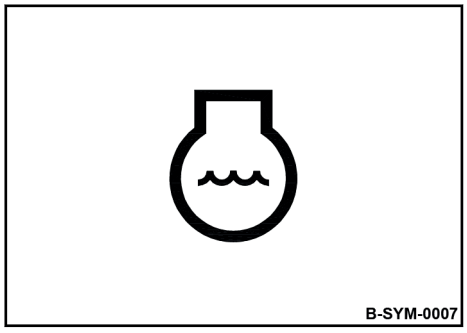

Fig. 4

WARNING!

Danger of scalding by hot fluid!

– Open the coolant compensation tank only after the engine has cooled down.
– Wear your personal protective outfit (protective gloves, protective clothing, goggles).

CAUTION!

Health hazard caused by contact with coolant and coolant additives!

– Wear your personal protective outfit (protective gloves, protective clothing).
– Do not inhale any fumes.
– Avoid contact.

CAUTION!

Danger of slipping on spilled coolant!

– Immediately bind spilled coolant with an oil-binding agent.

ENVIRONMENT!

Coolant is an environmentally hazardous substance

– Always keep coolant and coolant additives in proper containers.
– Immediately bind spilled coolant with an oil-binding agent and dispose of environmentally.
– Dispose of coolant according to regulations.

1.2.1.6 Safety regulations and environmental protection regulations for handling battery acid

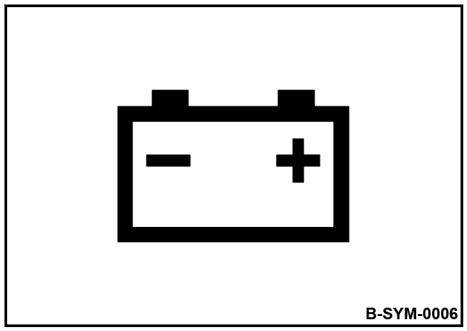

Fig. 5

WARNING!

Danger of cauterization with acid!

– Wear your personal protective outfit (protective gloves, protective clothing, goggles).
– Do not allow clothes, skin or eyes to come into contact with acid.
– Rinse off spilled battery acid immediately with lots of water.

Rinse acid off clothes, skin or eyes immediately with lots of clear water.

Immediately call for medical advice in case of cauterization.

WARNING!

Danger of injury caused by exploding gas mixture!

– Remove the plugs before starting to recharge the battery.
– Ensure adequate ventilation.
– Smoking and open fire is prohibited!
– Do not lay any tools or other metal objects on the battery.
– Do not wear jewellery (watch, bracelets, etc.) when working on the battery.
– Wear your personal protective outfit (protective gloves, protective clothing, goggles).

ENVIRONMENT!

Battery acid is an environmentally hazardous substance

– Dispose of battery and battery acid according to regulations.

1.2.2 Park the machine in secured condition.

1. Drive the machine onto level and firm ground.

2. Shift the travel lever to "Middle" position.

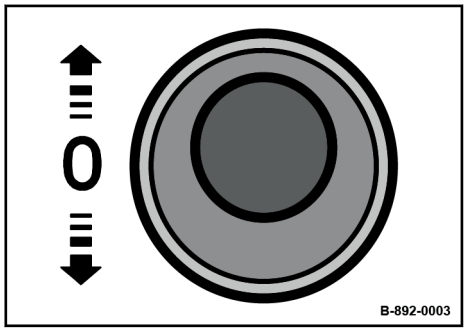

Fig. 6

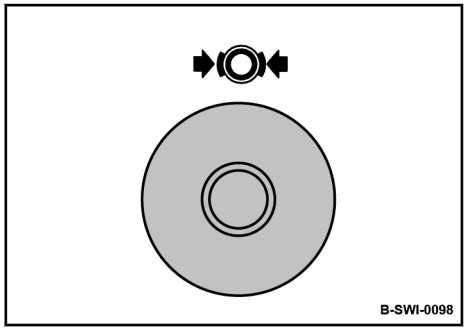

Fig. 7

3. Press the parking brake switch.

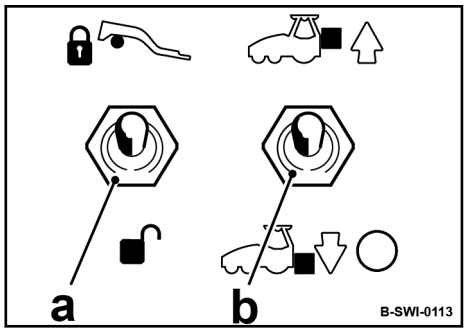

Fig. 8

4. Completely lower the screed with the toggle switch/button for lifting/lowering the screed (b).

NOTICE!

Danger of engine damage!

– Do not shut down the engine all of a sudden from full load speed, but let it idle for about 2 minutes.

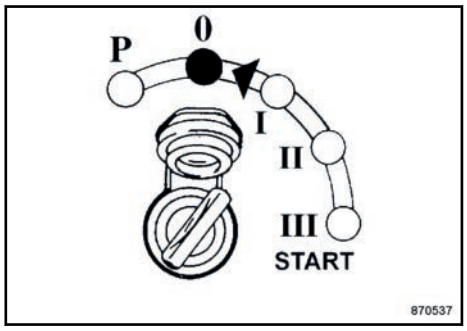

Fig. 9

5. Turn the ignition key to position "0" and pull it out.

NOTICE!

Danger of damage to the electronic system!

- In events of emergency do not use the main battery switch to shut down the engine.
- The main battery switch must only be pulled out at the earliest 40 seconds after switching off the ignition.

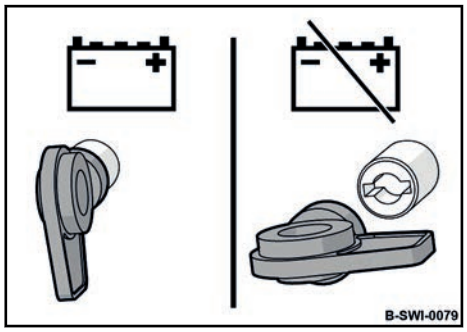

Fig. 10

6. Turn the main battery switch to position "Horizontal" and pull it out.

1.3 Fuels and lubricants

1.3.1 Engine oil

1.3.1.1 General

Modern diesel engines put high demands on the lubrication oil used. The engine powers that have continuously increased over the past few years lead to higher thermal loads for the lubrication oil. Apart from that, the lubrication oil is additionally loaded by contamination because of the reduced lubrication oil consumption and the prolonged lubrication oil change intervals.

For this reason it is necessary to follow the requirements and recommendations in these operating instructions in order not to reduce the lifetime of the engine.

Engine oils of the same specification can generally be mixed among each other. However, mixing of engine oil should be avoided, because the poorest characteristics of a mixture will always prevail.

The use of additives for lubrication oils is not permitted.

The lubrication oil quality has a considerable influence on the lifetime, performance and thus the economy of the engine. The following is generally valid: the better the lubrication oil quality, the better its properties.

1.3.1.2 Oil quality

Lubrication oils for use in DEUTZ engines are classified in DEUTZ Lubrication Oil Quality Classes (DQC).

The following lubrication oils have been approved:

Deutz	ACEA	API	DHD
DQC II- 10	E3-96 E4-12 E5-02 E7-12	CH-4 CI-4 CI-4 Plus	DHD-1
DQC III- 10	-	-	-
DQC IV-10	-	-	-

The list of approved lubrication oils is also available in the Internet under the following address:

www.deutz.com	
de	SERVICE \ Betriebsstoffe und Additive \ Deutz Quality Class \ DQC-Freigabeliste
en	SERVICE \ Operating Liquids and Additives \ Deutz Quality Class \ DQC Release List

1.3.1.3 Oil viscosity

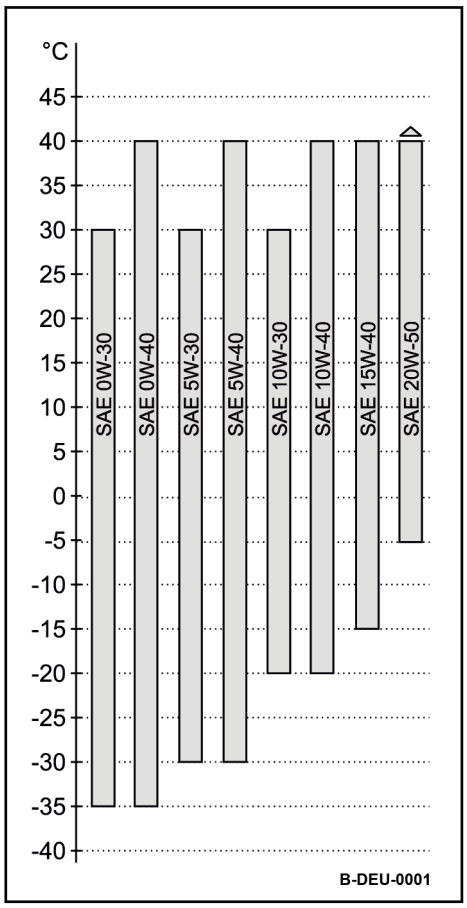

Fig. 11: Oil viscosity diagram

Since lubrication oil changes its viscosity with the temperature, the ambient temperature at the operating location of the engine is of utmost importance when choosing the viscosity class (SAE-class) .

Multi-purpose oils should generally be used.

Too high viscosity can cause starting difficulties, too low ´viscosity can jeopardize the lubrication effect and result in a high lubrication oil consumption.

Optimal operating conditions can be achieved by using the oil viscosity chart as a reference.

At ambient temperatures below -40 °C (-40 °F) the lubrication oil must be pre-heated (e.g. by parking the machine indoors).

1.3.1.4 Oil change intervals

The longest permissible time a lubrication oil should remain in an engine is 1 year. If the following oil change intervals are not reached over a period of one year, the oil change should be performed at least 1x per year, irrespective of the operating hours reached.

Oil change interval with DQC II, DQC III, DQC IV: 500 operating hours.

1.3.2 Fuel

1.3.2.1 General

You should only use commercially available brand diesel fuel with a sulphur content below 0.5% and ensure strict cleanliness when filling in. A higher sulphur content has a negative effect on the oil change intervals.

The fuel level should always be topped up in due time so that the fuel tank is never run dry, as otherwise filter and injection lines need to be bled.

1.3.2.2 Fuel quality

The following fuel specifications are permitted:

- EN 590
- DIN 51628
- ASTM D975 Grade-No. 1-D and 2-D.
- JIS K 2204 Grade Fuel 1 and Grade Fuel 2 with lubrication properties acc. to EN 590

1.3.2.3 Winter fuel

For winter operation use only winter diesel fuel, to avoid clogging because of paraffin separation.

At very low temperatures disturbing paraffin separation can also be expected when using winter diesel fuel.

Diesel fuels suitable for temperatures down to -44 °C (-47 °F) are available for Arctic climates.

NOTICE!

Danger of engine damage!

– The admixture of petroleum and the addition of "flow enhancing additives" (fuel additives) is not permitted.

1.3.2.4 Storage

Even traces of zinc, lead and copper can cause deposits in the injection nozzles, especially in modern Common-Rail injection systems.

Zinc and lead coatings in refuelling systems and fuel lines are not permitted.

Copper containing materials (copper lines, brass items) should be avoided, because they can cause catalytic reactions in the fuel with subsequent depositing in the injection system.

1.3.3 Coolant

1.3.3.1 General

For fluid cooled engines the cooling fluid must be prepared by admixing a cooling system protection agent to the fresh water and should be checked within the specified maintenance intervals.

This prevents damage caused by corrosion, cavitation, freezing and overheating.

1.3.3.2 Water quality

The correct quality of water is highly important when preparing coolant. Clear and clean water within the boundaries of the following analysis values should generally be used.

Analysis values	
pH-value at 20 °C (68 °F)	6.5 - 8.5
Chlorine-ion content	max. 100 mg/l
Sulphate ion content	max. 100 mg/l
Water hardness (ion content of calcium and magnesium)	max. 3.56 mmol/l max: 356 mg/l (ppm)
Germ degree:	max. 20 °dH
English degree:	max: 25 °eH
French degree:	max: 35.6 °fH
Bacteria, fungi, yeasts	not permitted

Information concerning the water quality can be obtained from the waterworks.

If the fresh water analysis values are unknown, these must be determined with the help of a water analysis.

If the values of the analysis deviate, the water must be treated accordingly:

pH-value too low	- Adding of caustic lye of soda or caustic potash solution.
Water hardness too high	- Mix with soft, distilled or fully demineralized water
Chlorides and/or sulphates too high	- Mix with distilled or fully demineralized water

NOTICE!

Danger of engine damage!

– Another analysis must be made after the fresh water has been prepared.

1.3.3.3 Cooling system protection agent

As a protection against frost, corrosion and boiling point anti-freeze agents must be used under any climatic conditions.

Coolant is prepared by adding an ethylene-glycol based anti-freeze agent with corrosion inhibiting properties to the cooling water.

We therefore highly recommend our BOMAG cooling system protection agent.

If our cooling system protection agent is not available for any important reasons, you may, in exceptional cases, use products that have been approved by the engine manufacturer.

The list of approved lubrication oils is also available in the Internet under the following address:

www.deutz.com	
de	SERVICE Betriebsstoffe und Additive DeutzQuality-Class DQC-Freigabeliste
en	SERVICE \ Operating Liquids and Additi-ves \ Cooling System Conditioner

Products of the same product group (see Deutz Technical Circular Cooling System Protection Agents) can be mixed with each other.

The BOMAG cooling system protection agent corresponds with product group A.

NOTICE!

Danger of engine damage!

- Do not mix different coolants and additives of any other kind.
- Before changing the product you must clean the entire cooling system.
- Consult our customer service if in doubt.
- The cooling system protection agent must be used all year round, to provide adequate corrosion protection.

The following mixing ratio must not be fallen short of or exceeded:

Cooling system protection agent	Fresh water	Cold protection down to
min. 35%	65%	-22 °C (-8 °F)
40%	60%	-28 °C (-18 °F)
45%	55%	-35 °C (-31 °F)
max. 50%	50%	-41 °C (-42 °F)

NOTICE!

Danger of engine damage!

- A proportion of more than 50% of cooling system protection agent causes a drop in cooling power.
- The use of corrosion protection oils as cooling system protection agents is not permitted.

1.3.4 Hydraulic oil

1.3.4.1 Mineral oil based hydraulic oil

The hydraulic system is operated with hydraulic oil HV 32 (ISO) with a kinematic viscosity of 32 mm^2/s at 40 °C (104 °F).

For topping up or for oil changes use only high-quality hydraulic oil, type HVLP according to DIN 51524, part 3, or hydraulic oils type HV according to ISO 6743-4.

The viscosity index (VI) should be at least 150 (observe information of manufacturer).

1.3.5 Gear oil

For the gearboxes use only multi-purpose gear oils ISO VG 220 of API GL5-class with a minimum viscosity of 20 mm^2/s at 100 °C (212 °F).

This is a hypoid lubricant of highest quality class for extremely loaded transmissions.

The additives in this oil ensure low wear lubrication under all operating conditions.

1.3.6 Lubrication grease

For lubrication purposes use an EP-high pressure grease, lithium saponified (penetration 2), acc. to DIN 51502 KP 2G.

1.3.7 High-temperature lubrication grease

For lubrication purposes use an EP-high pressure grease, lithium saponified (penetration 2), for raised bearing temperatures acc. to DIN 51502 KP 3 P-20.

NLGI-classification 3 acc. to DIN 51818.

1.4 Table of fuels and lubricants

Assembly	Fuel or lubricant		Spare parts number	Filling quantity
	Summer	Winter		Observe the level marks!
Engine oil	SAE 10W/-40 Specification: *Chapter 1.3.1 'Engine oil' on page 17*		009 920 06 20 l	10.5 l (2.8 gal us)
	SAE 5W-30			
	SAE 15W-40			
	SAE 5W-40			
Fuel	Diesel	Winter diesel fuel		285 l (75 gal us)
	Specification: *Chapter 1.3.2 'Fuel' on page 19*			
Coolant	Mixture of water and anti-freeze agent Specification: *Chapter 1.3.3 'Coolant' on page 20*		009 940 02 20 l	32 l (8.5 gal us)
Hydraulic system	Hydraulic oil (ISO), HV32 Specification: *Chapter 1.3.4.1 'Mineral oil based hydraulic oil' on page 22*			160 l (42 gal us)
Transfer gearbox	SAE 80W-140, API GL-5 Specification: *Chapter 1.3.5 'Gear oil' on page 22*		009 925 07 20 l	9 l (2.4 gal us)
Travel gears	SAE 80W-140, API GL-5		009 925 07 20 l	3.5 l each (0.9 gal us)
Lubrication points	High pressure grease (lithium saponified) Specification: *Chapter 1.3.6 'Lubrication grease' on page 22*			as required
Auger drive chain box	High temperature - high pressure grease (lithium saponified) Specification: *Chapter 1.3.7 'High-temperature lubrication grease' on page 22*		009 960 09 400 g	as required
Emulsion	Release agent tank		009 741 00 20 l	30 l (8 gal us)

General – Table of fuels and lubricants

2 Technical data

Technical data

Dimensions

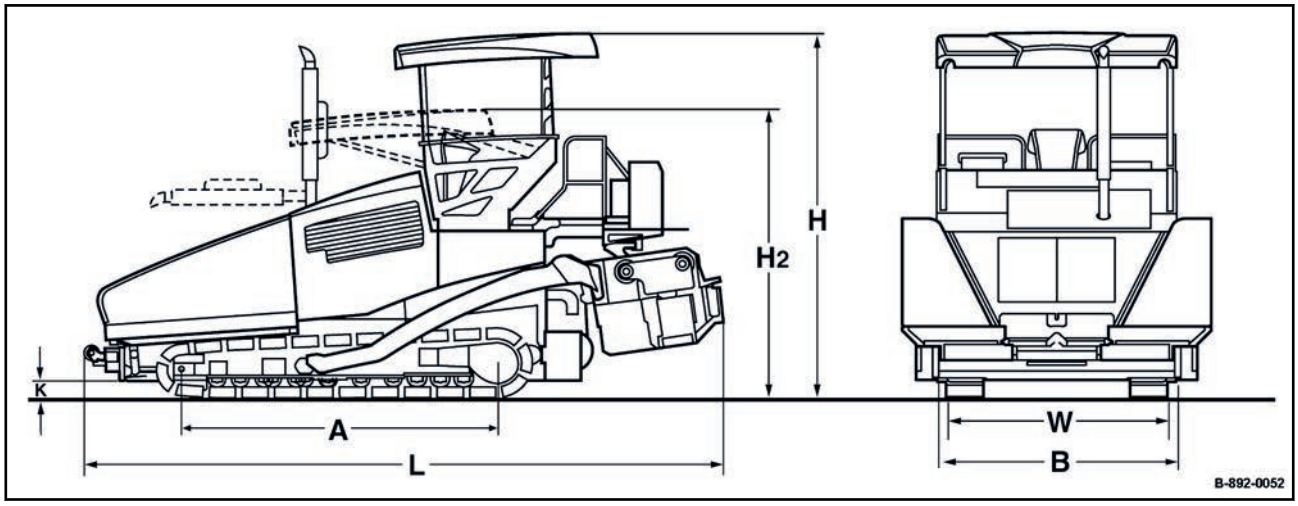

Fig. 12

A	B	H	H_2	L	W
2975 (117)	2550 (100)	3910 (154)	3061 (121)	6460 (254)	2255 (89)
Dimensions in millimetre (Dimensions in inch)					

Weights		
Operating weight (CECE) with screed	19800 (43651)	kg (lbs)

Travel characteristics		
Working speed	0 – 25 (0 – 66)	m/min (ft/min)
Travel speed	0 – 4 (0 – 2.5)	km/h (mph)
Max. permissible ascent	15	°

Drive		
Engine manufacturer	Deutz	
Type	TCD 2013 L04 2V	
Cooling	Fluid	

Drive		
Number of cylinders	4	
Rated power ISO 3046	128/172	kW/hp
Rated speed	2000	min^{-1}
Fuel	Diesel	

Crawler track		
Ground contact area (length x width)	2975 x 300	mm
	(117.1 x 11.8)	(in)

Hopper		
Capacity	7	m^3
	(247)	(ft^3)
Width (wings open)	3330	mm
	(131)	(in)
Width (wings closed)	2270	mm
	(89)	(in)
Length	1800	mm
	(71)	(in)
Filling height (middle)	590	mm
	(23.2)	(in)

Scraper belt / auger		
Quantity	2	
Rated speed	64	min^{-1}
Individual control	Standard	
Reversing operation	Standard	

Conveyor auger		
Quantity	2	
Width	400	mm
	(15.7)	(in)
Rated speed	117	min^{-1}
Reversing operation	Standard	

Technical data

Screed		
Basic width retracted	2550 (100)	mm (in)
Basic width extended	5000 (197)	mm (in)
Max. working width	7500 (295)	mm (in)
Min. paving width with reducing skids	1800 (71)	mm (in)
Mat height	300 (11.8)	mm (in)
Smoothing plate depth	400 (15.7)	mm (in)
Smooting plate thickness	15 (0.6)	mm (in)
Heating	electric	
Straight crossfalls	-2,5 to +4,5	%
Tamper frequency	0 to 30	Hz
Vibration frequency	0 to 60	Hz

Filling capacities		
Fuel (diesel)	285 (75)	l (gal us)

Travel pump		
Manufacturer		Bosch-Rexroth
Type		A4VG
System		Axial piston variable displacement pump
Maximum displacement	56	cm^3/rev
Maximum pumping delivery	202	l/min
High pressure limitation	450	bar
Charge pressure	25	bar

Scraper belt pump		
Manufacturer		Bosch-Rexroth
Type		A10VG
System		Axial piston variable displacement pump
Maximum displacement	28	cm^3/rev
Maximum pumping delivery	109	l/min
High pressure limitation	340-360	bar
Charge pressure	17-25	bar

Auger drive pump		
Manufacturer		Bosch-Rexroth
Type		A10VG
System		Axial piston variable displacement pump
Maximum displacement	45	cm^3/rev
Maximum pumping delivery	152	l/min
High pressure limitation	350	bar
Charge pressure	25	bar

Working pump		
Manufacturer		Bosch-Rexroth
Type		A10VO
System		Swash plate pump
Maximum displacement	45	cm^3/rev
Permanent pressure	180	bar
Nominal pressure	250	bar
High pressure limitation	315	bar
Maximum speed	2935	rpm

Fan pump		
Manufacturer		Bosch-Rexroth
Type		A10VO

Technical data

Fan pump		
System		Axial piston pump
Maximum displacement	28	cm^3/rev
Maximum pumping delivery	84	l/min
Permanent pressure	180	bar
Nominal pressure	250	bar
High pressure limitation	315	bar
Maximum speed	3000	rpm

3 Total overview of machine

3.1 Component overview - Electrics

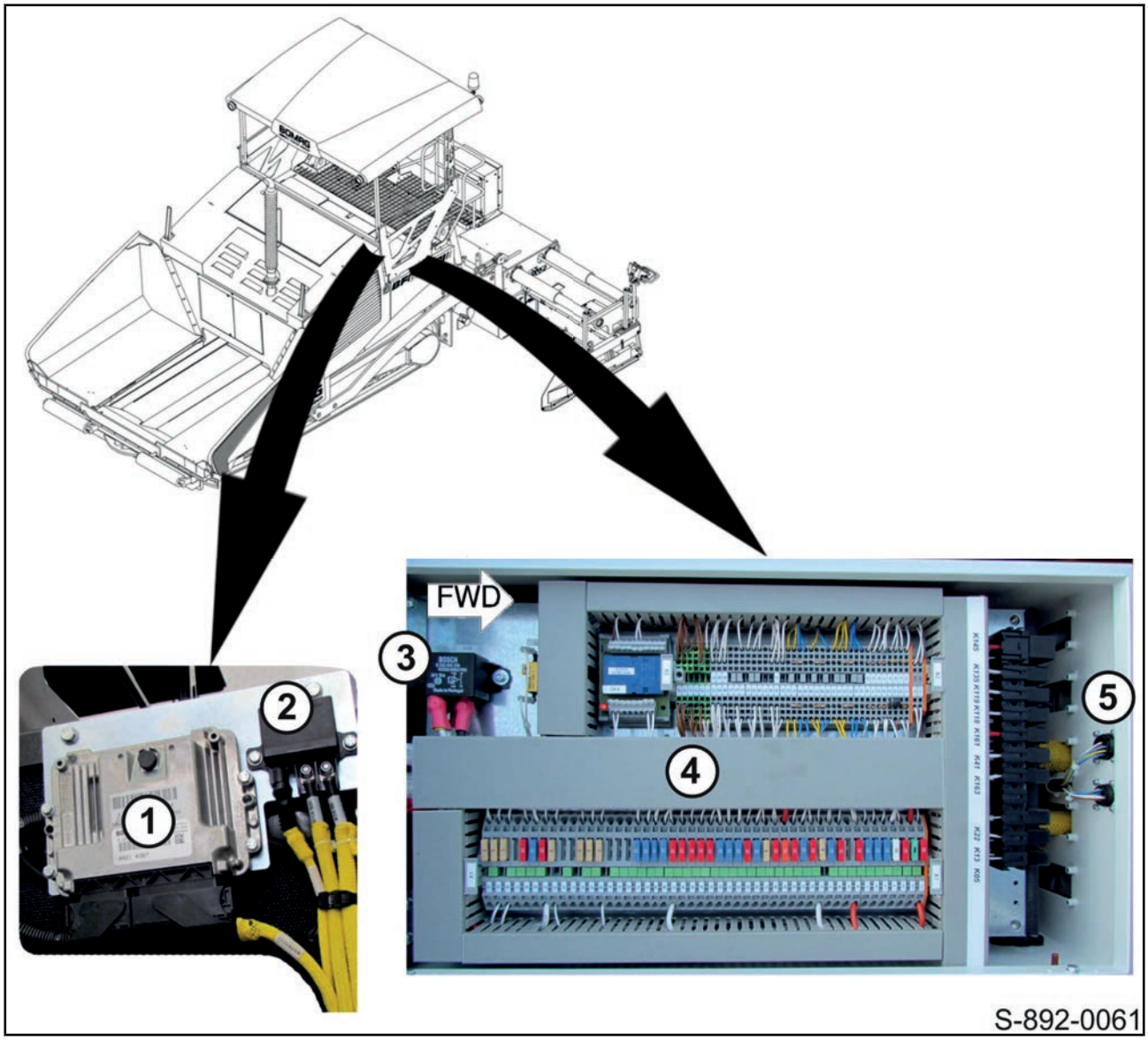

Fig. 13

1 Engine control unit - ***A48***
2 Pre-heating relay - ***K14***
3 Starter relay
4 Central electrics with fuse and relay box
5 Diagnostics sockets

Overview of switches in dashboard

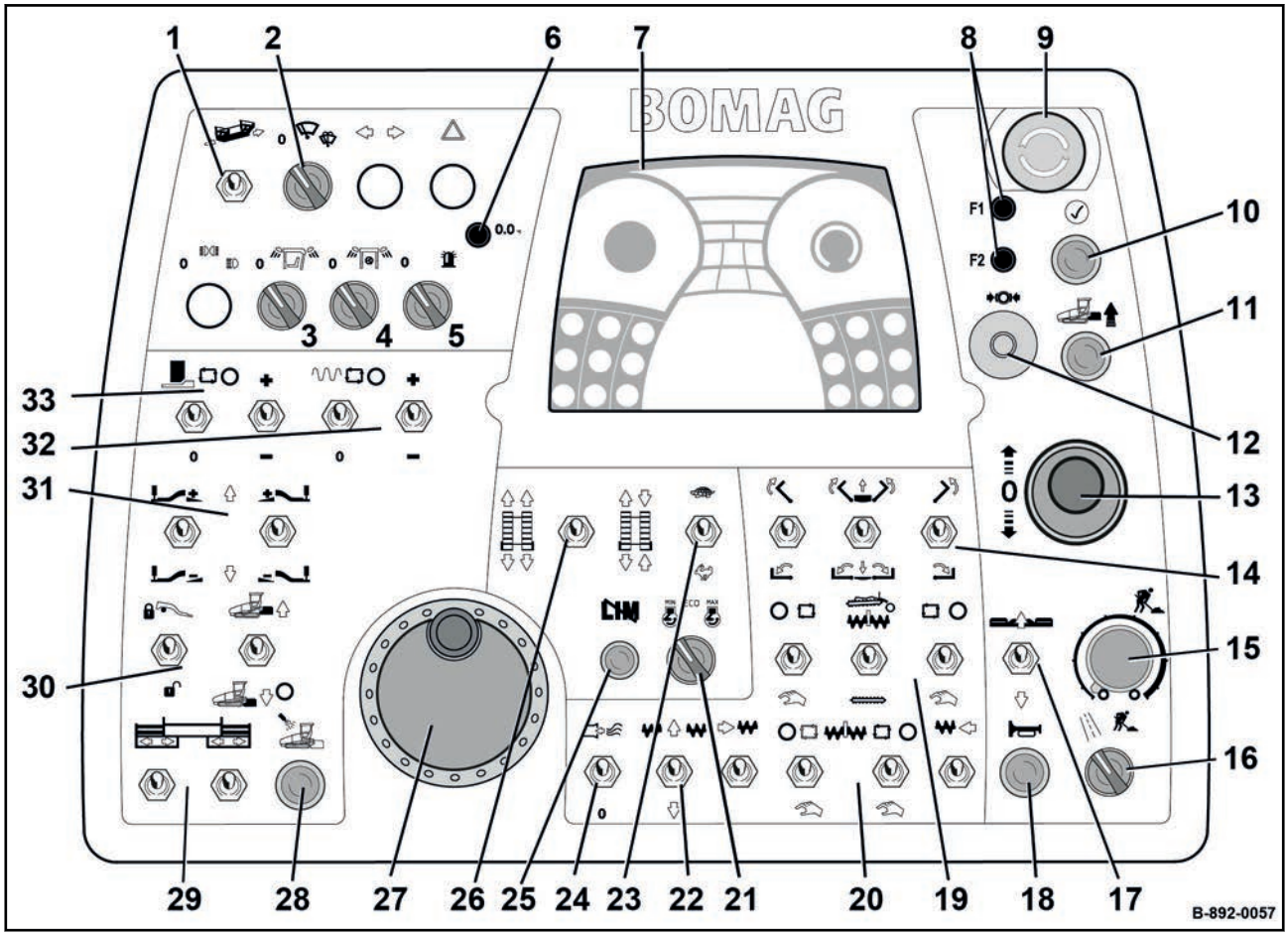

Fig. 14

1 ***S288*** Toggle switch on driver's platform *(optional equipment)*
2 ***S20*** Rotary switch/button windscreen wiper/washer *(optional equipment)*
3 ***S16*** Rotary switch working lights front and rear
4 ***S335*** Rotary switch, lateral working lights *(optional equipment)*
5 ***S38*** Rotary switch for flashing beacon
6 ***S338*** Function button to reset the meter counter
7 ***A81*** LC-Display unit
8 ***S280/S281*** Function keys F1 and F2
9 ***S01*** Emergency stop push button
10 ***S218*** Push button to release hydraulics and travel functions
11 ***S250*** Push button for partial unloading of screed
12 ***S04*** Parking brake switch
13 ***S221*** Travel lever
14 Hopper control panel
15 ***R07*** Travel speed potentiometer
16 ***S217*** Rotary switch for operating mode
17 ***S327*** Toggle switch press rollers *(optional equipment)*
18 ***S03*** Push button for warning horn
19 Scraper belt control panel
20 Auger control panel
21 ***S120*** Rotary switch for engine speed
22 ***S236*** Toggle button for auger height adjustment
23 ***S220*** Toggle switch, travel ranges

24 ***S197*** Tumbler switch for asphalt fume extraction system *(optional equipment)*
25 Push button reduced engine power
26 ***S261*** Toggle button for track control
27 ***A45*** Steering wheel
28 ***S326*** Push button for cleaning function
29 Screed width control panel
30 Control panel screed up/down
31 Levelling control panel
32 Control panel for screed vibration
33 Control panel for screed tamper

Overview of switches in dashboard Designations for the right hand side are in brackets ().

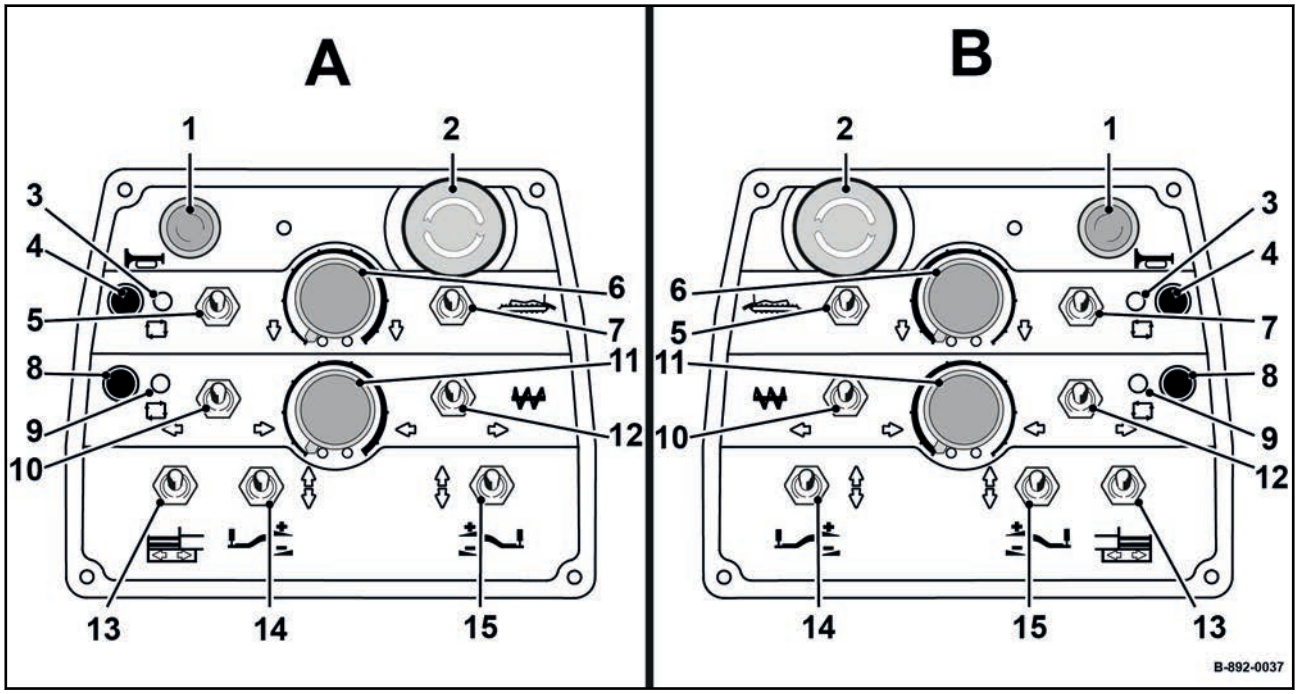

Fig. 15

A External operator stand on left hand side
B External operator stand on right hand side
1 ***S213 (S214)*** Push button for warning horn
2 ***S125 (S126)*** Emergency stop switch
3 ***H116 (H119)*** Control lamp for scraper belt in automatic mode
4 ***S331 (S332)*** Push button for scraper belt in automatic mode
5 ***S228 (S292)*** Toggle button, scraper belt left
6 ***R96 (R97)*** Potentiometer ultrasonic sensor for scraper belt
7 ***S293 (S229)*** Toggle button, scraper belt right
8 ***S333 (S334)*** Push button for auger in automatic mode
9 ***H122 (H132)*** Control lamp for auger in automatic mode
10 ***S234 (S235)*** Toggle button, auger left
11 ***R98 (R99)*** Potentiometer, ultrasonic sensor auger
12 ***S239 (S235)*** Toggle button, auger right
13 ***S241 (S242)*** Toggle button for screed width
14 ***S245 (S284)*** Toggle button, cylinder left
15 ***S285 (S246)*** Toggle button, cylinder right

Overview of switches in screed control panel

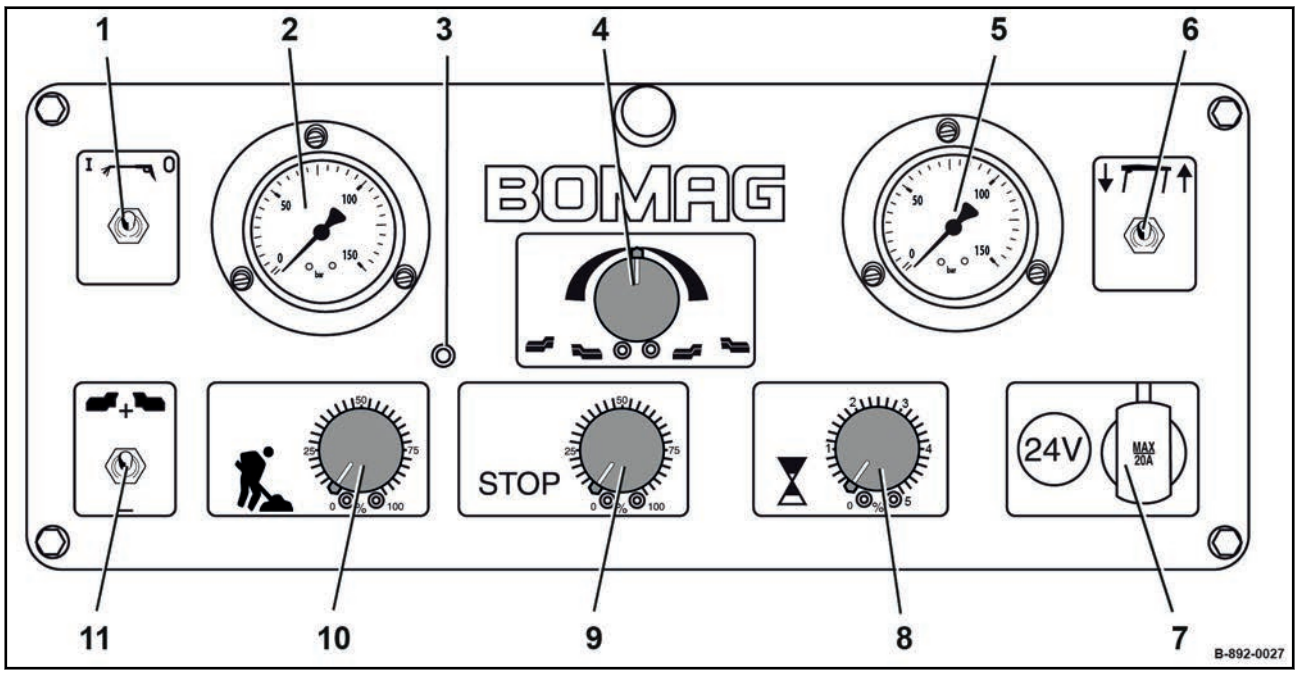

Fig. 16

1 ***S251*** Toggle switch for cleaning system
2 Pressure gauge for relief pressure
3 ***H124*** Control lamp, screed relieved
4 ***R123*** Potentiometer for screed relief right/left distribution *(optional equipment)*
5 Pressure gauge for relief pressure *(optional equipment)*
6 ***S296*** Toggle button for protective roof *(optional equipment)*
7 24 V Universal socket
8 ***R102*** Potentiometer for timer
9 ***R101*** Potentiometer for screed relief - machine stopped
10 ***R100*** Potentiometer for screed relief - machine in motion
11 ***S258*** Toggle button for crown adjustment *(optional equipment)*

3.2 Component overview - Wiring looms

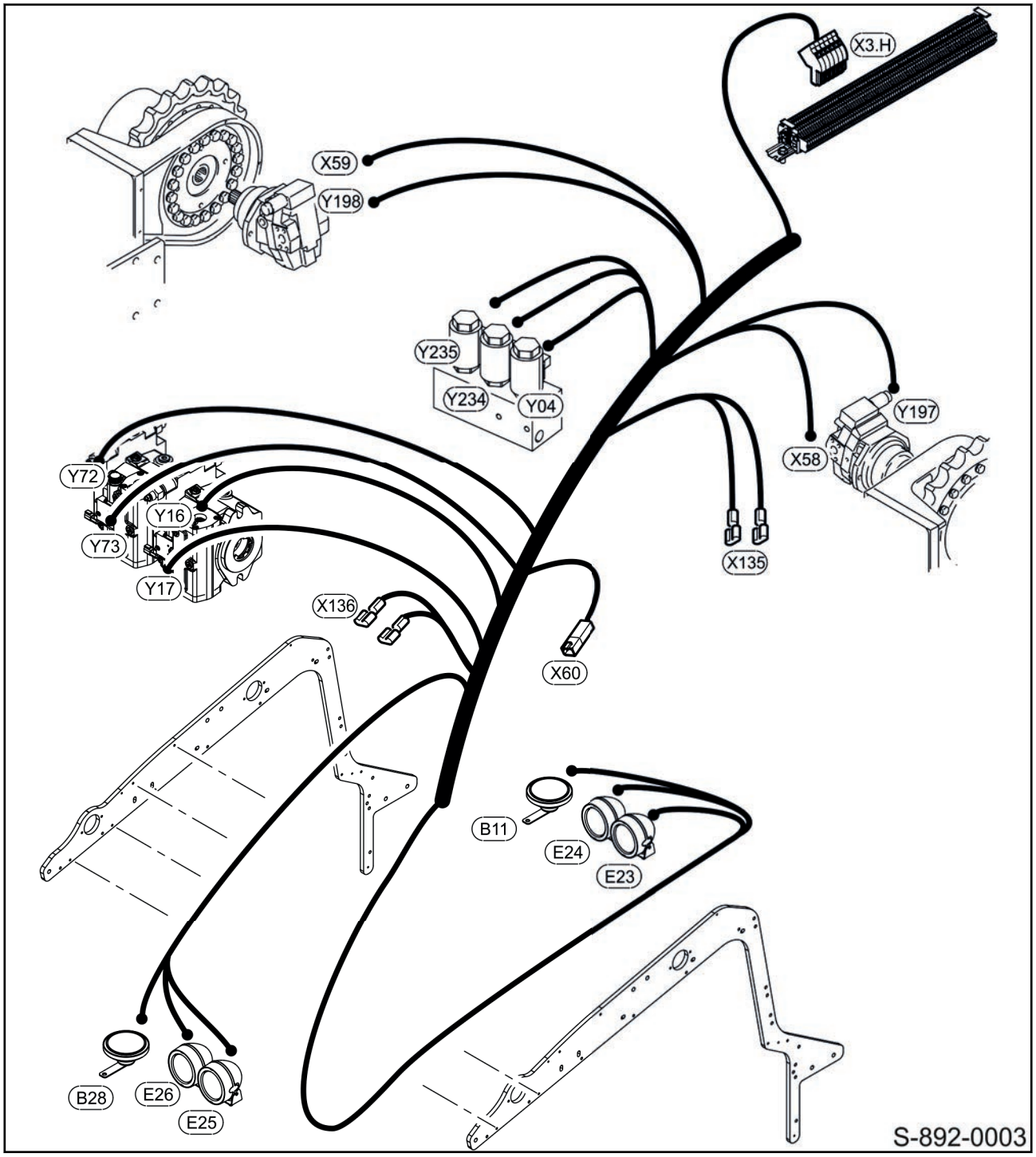

Fig. 17

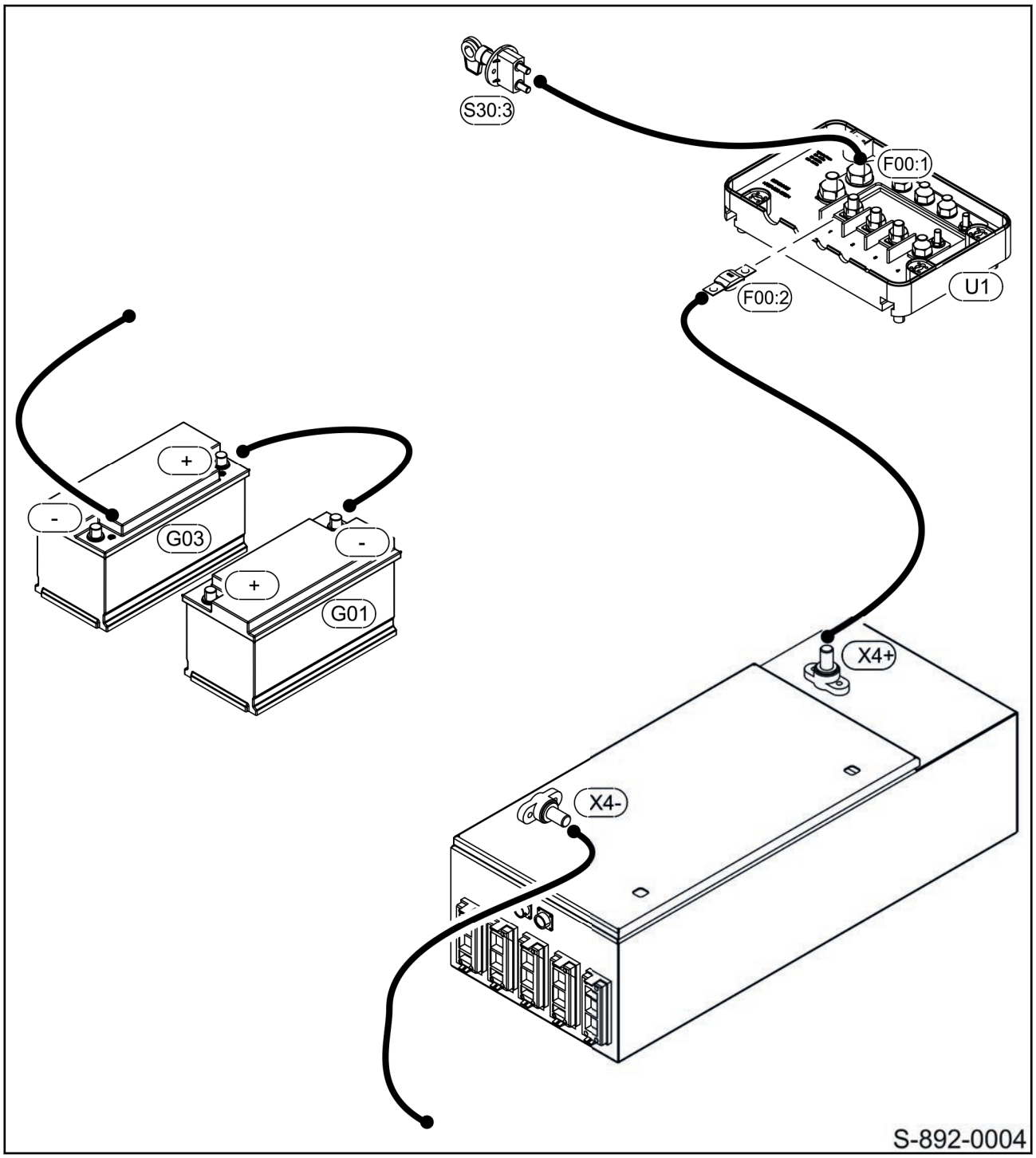

Fig. 18

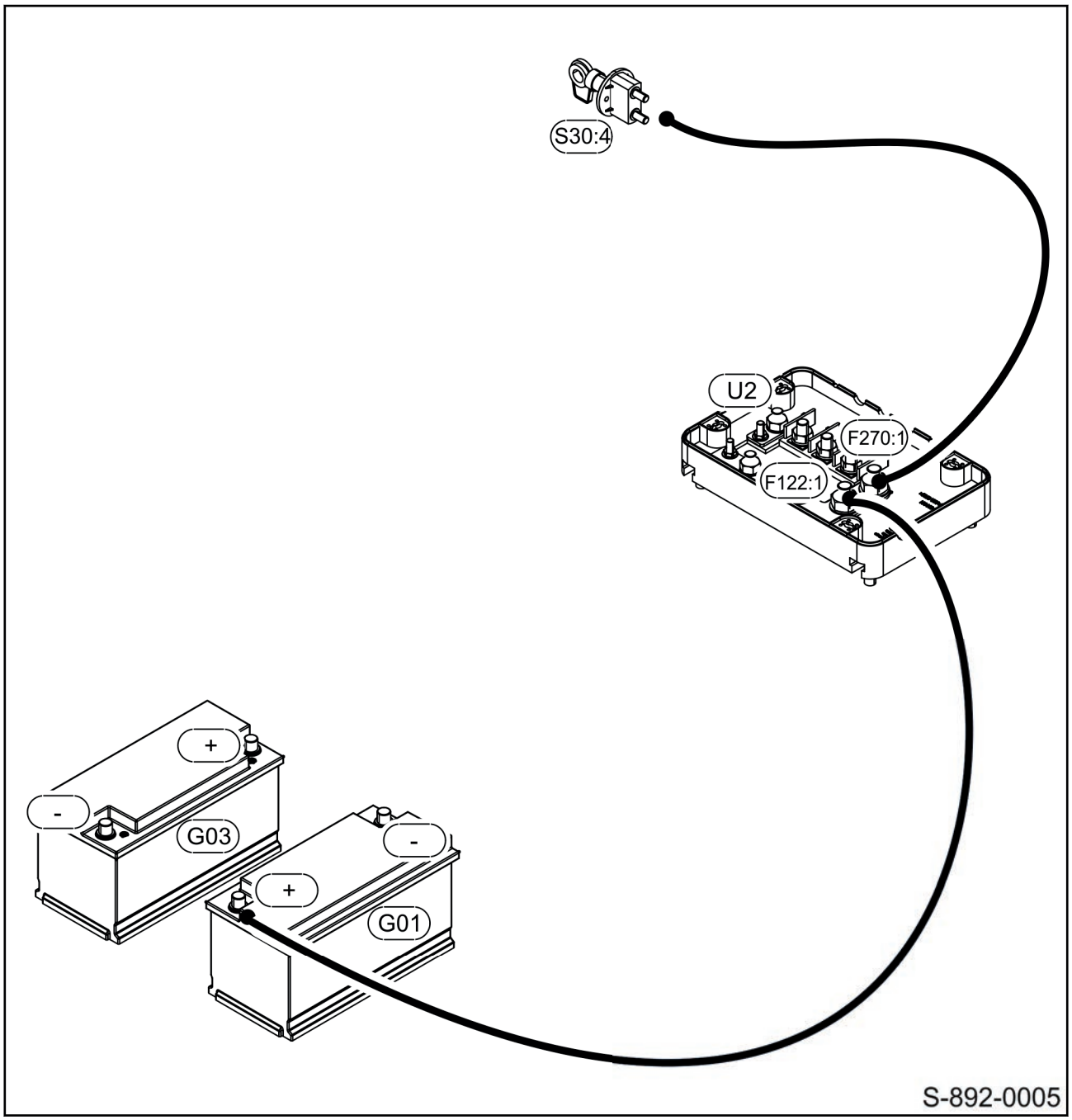

Fig. 19

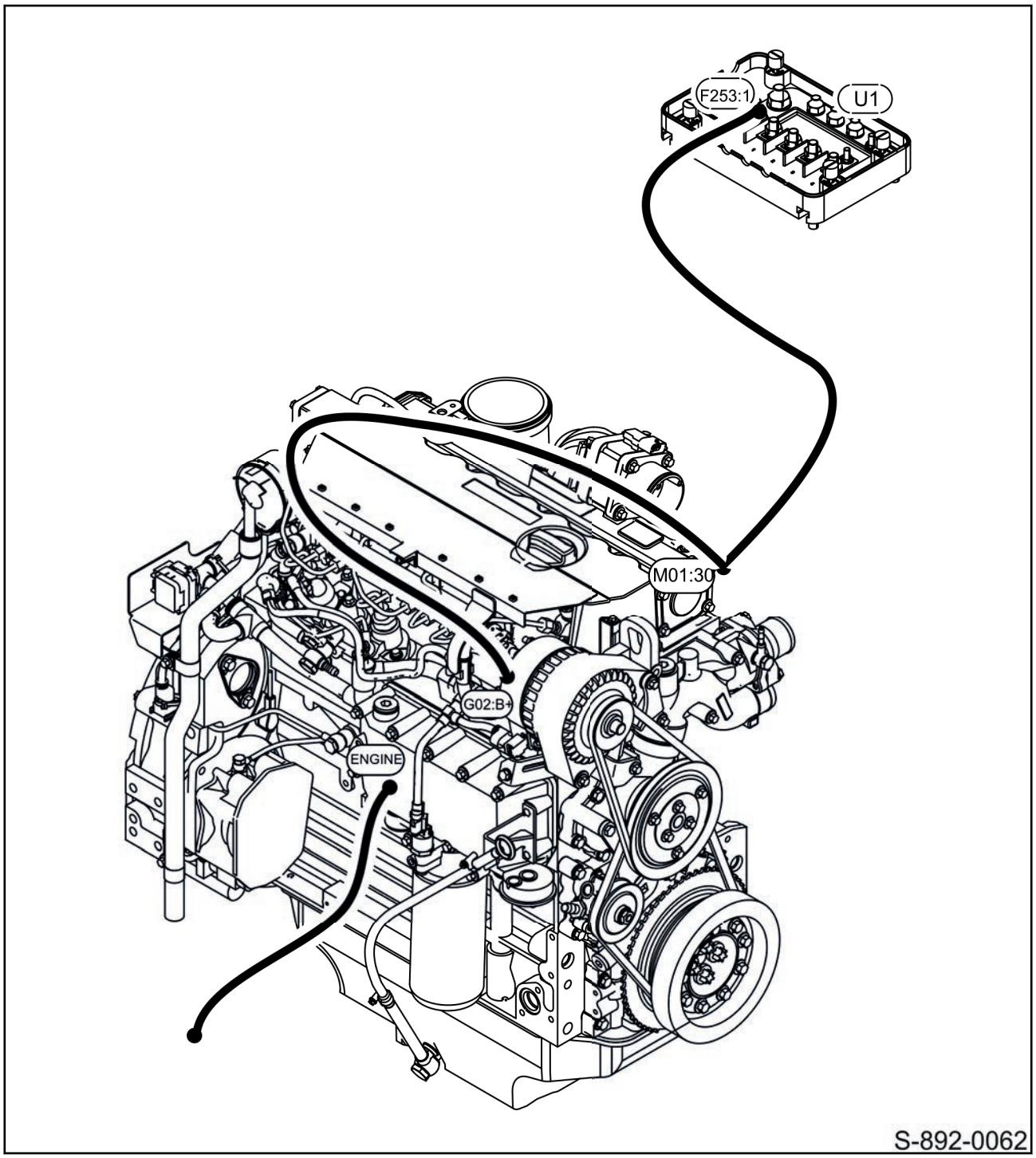

Fig. 20

Total overview of machine – Component overview - Wiring looms

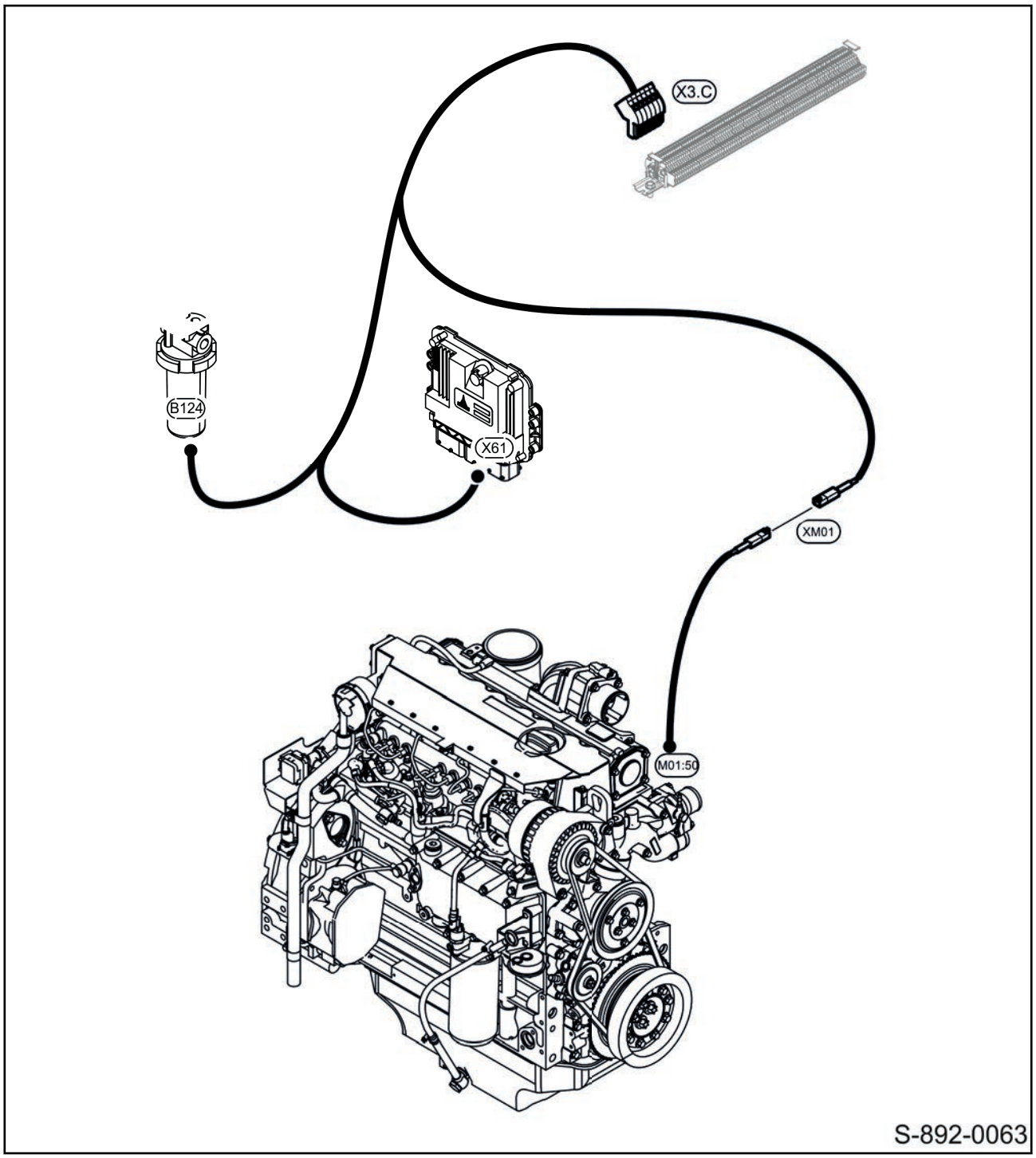

Fig. 21