Smart Construction
3D Machine Guidance
DCDC converter installation instructions

EARTHBRAIN

revision history

Date	Contents
2025/4/1.	first edition
2025/9/19	Minor updates -Change picture -Add BAND

Before You Start

●Please read this first.

This manual explains how to install Smart Construction 3D Machine Guidance, an application provided by EARTHBRAIN Corporation.
This manual describes how to install this kit and the items to be observed for safe use.
The installation does not have to be the same as in this document. Some vehicles may not be able to be installed in the same way as in this document. Please check the vehicle first and consider whether the kit can be installed beforehand.
-Many accidents have occurred when working without following basic precautions.
Before starting to use this kit, read and follow all the information contained in this manual. Failure to follow the warnings and cautions may result in serious injury or death.
The company cannot foresee every situation that may arise when the customer uses the product. For this reason, the precautions described in this document do not cover all safety matters. Therefore, when using this application in situations not described in this manual, please take all necessary safety precautions at your own risk. In addition, please do not perform any of the actions prohibited in this manual.
This manual uses the International System of Units (SI) as the display unit.
The descriptions, figures and illustrations in this manual are based on information available at the time this manual was prepared. Due to constant improvements, the actual specifications may differ from those in this manual.
If you have any questions or concerns, please contact the EARTHBRAIN Support Centre listed at the end of this document.
The manufacturer or distributor is not responsible for the accuracy of this kit or for any malfunction of the unit resulting from its installation.
-Persons with experience in the maintenance and servicing of construction vehicles should work on them.
When welding operations are carried out, they should be carried out by operators who are familiar with and skilled in welding.
Basically, the bracket kit should be installed. Use of magnets on bulldozers or other objects subject to high vibration and shock may cause misalignment. When using the magnet kit, mark the initial mounting positions of the antenna, controller and IMU and inspect them daily.

● Uses of the product.

This kit is a retrofit kit for providing ICT functions to existing vehicle-based machinery. By installing this kit, the following functions become available, enabling machine-guided construction even on conventional construction machinery.

- 3D-machine guidance function (*1)
- 3D construction history data acquisition function

1 A function that acquires the machine's position information by GNSS and provides the difference between the design data of the construction area and the driving position to the tablet in the driver's seat.

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01

Chapter

Safety Precautions.

Table of contents

1. Safety precautions.

1.1 How to read the warning signs

The following warning signs are used in this manual and in this kit to identify safety messages. Follow these warning signs.

⚠ Caution	Indicates a hazard which, if not avoided, could result in serious injury or death.
⚠ Notice	Indicates a risk of injury if not avoided.

Other instructions that must be observed for the kit and its installation are described in the following indications.

Note	Indicates a hazard which, if not avoided, could result in serious injury or death, damage to equipment or vehicles, or unexpected behaviour.
supplementary explanation	Indicates a risk of injury, damage to equipment/vehicle or unexpected operation if not avoided.

1.2 Safety precautions.

⚠Caution

May result in serious injury or death.

-When working at height, use a height work vehicle, lifting steps and safety belt for safety.
-Use a handrail, ladder or step when ascending or descending the kit-equipped machine. Always face the front of your body towards the machine with the kit and direct your body by placing at least three of your arms or legs over a handrail, ladder or step. If no scaffolding is provided, use a stepladder or step stool.
-Do not work in wet or stormy weather.
-For the safety of the operator and the surrounding area, the warning signs in this manual and on the kit must be observed.
- Do not modify this kit.

⚠ Notice

There is a risk of injury.

-Wear safety shoes and a helmet at all times while working.
-Do not wear sloppy or unbuttoned work clothes.

Note

When using tools, always use standard tools. Also, always use the correct torque for tightening work. There is a risk that parts may be damaged.

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02

Chapter

DCDC Converter Installation Overview

2. DCDC Converter Installation Overview

2.1 Kit overview (included in the kit)

The kit includes the following: 24 V power supply with 12 V output in the event of a wiring short circuit.
The controller CAN IC protection is effective in the following areas.

- DCDC converter
- Connection harness (between DCDC converter and vehicle body)

For PC (DT6pin - M2pin)

For PW (DT6pin - EJ2 12pin)

DCDC Converter

2.2 Installation precautions

This installation manual is based on the Komatsu PC200-11.
When installing on other sizes or on other manufacturers' machines, please refer to the shop manual or other shop manuals for installation.

2.3 List of part numbers

The part number list for this kit is as follows: 24 V power supply with 12 V output in the event of a wiring short circuit.
The controller CAN IC protection is effective in the following areas.

- DCDC converter
- Connection harness (between DCDC converter and vehicle body)

*The **harness connector may not be compatible with the vehicle body.**
If it is not applicable, connector modification work is required, for example, by referring to a shop manual.
Please take sufficient care in carrying out the work.

	No		品番	部品	個数
(DT6pin - M2pin) 	1	TOP	L01-1004010	12VDCDC CON OPT U.,PC	
	2		2A5-06-11881	CONVERTER	1
	3		L02-00-01530	WIRING HARNESS	1
	4		01252-80520	BOLT	2
	5		01640-50508	WASHER	2
	6		08034-20536	BAND	10
(DT6pin - EJ2 12pin) 	1	TOP	L01-1004020	12VDCDC CON OPT U.,PW	
	2		2A5-06-11881	CONVERTER	1
	3		L02-00-01540	WIRING HARNESS	1
	4		01252-80520	BOLT	2
	5		01640-50508	WASHER	2
	6		08034-20536	BAND	10

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03

Chapter

Kit Installation Method and Procedure

3. Kit installation method and procedure

Install this kit to the vehicle body. Follow the precautions and work procedures in this manual to ensure safe operation. The general work flow is as follows.

3.1 Notes.

3.1.1 Precautions for installation

⚠ Notice

There is a risk of injury.

For installation instructions and notes not covered in this manual, refer to the shop manual for the respective construction equipment.

note

Tightening torques for bolts and nuts should be as indicated in the table below, unless otherwise indicated.

Bolt Size	Tightening torque	
	N-m	Kgf-m
M6	11.8 - 14.7	1.2 - 1.5
M8	27 - 34	2.8 - 3.5
M10	59 - 74	6 - 7.5
M12	98 - 123	10 - 12.5

3.1.2 Tools used

No.	Name of Product	Technical Specification	Quantity
1	socket	10 mm/11 mm/12 mm/13 mm	1
2	torque spanner	-	1
3	ratchet	-	1
4	hexagonal spanner	-	1
5	Cutting tools such as nippers	-	1

3.1.3 Preparatory work

note
When using tools, always use standard tools. Always use the correct torque for tightening work. There is a risk that parts may be damaged.

- Park the machine that will be equipped with this kit on a level surface.
- Put the lock lever in the lock position and then stop the engine.
- Wait until the system operating lamp goes out (maximum 6 minutes after turning the instruction switch OFF) and check that it has gone out before turning the disconnect switch to the OFF position.
- Before disconnecting electrical wiring and hoses, note down the connector number and mounting position.
- When connecting a locking-type connector with harness jaws, insert the connector until you hear the jaws engage (click).

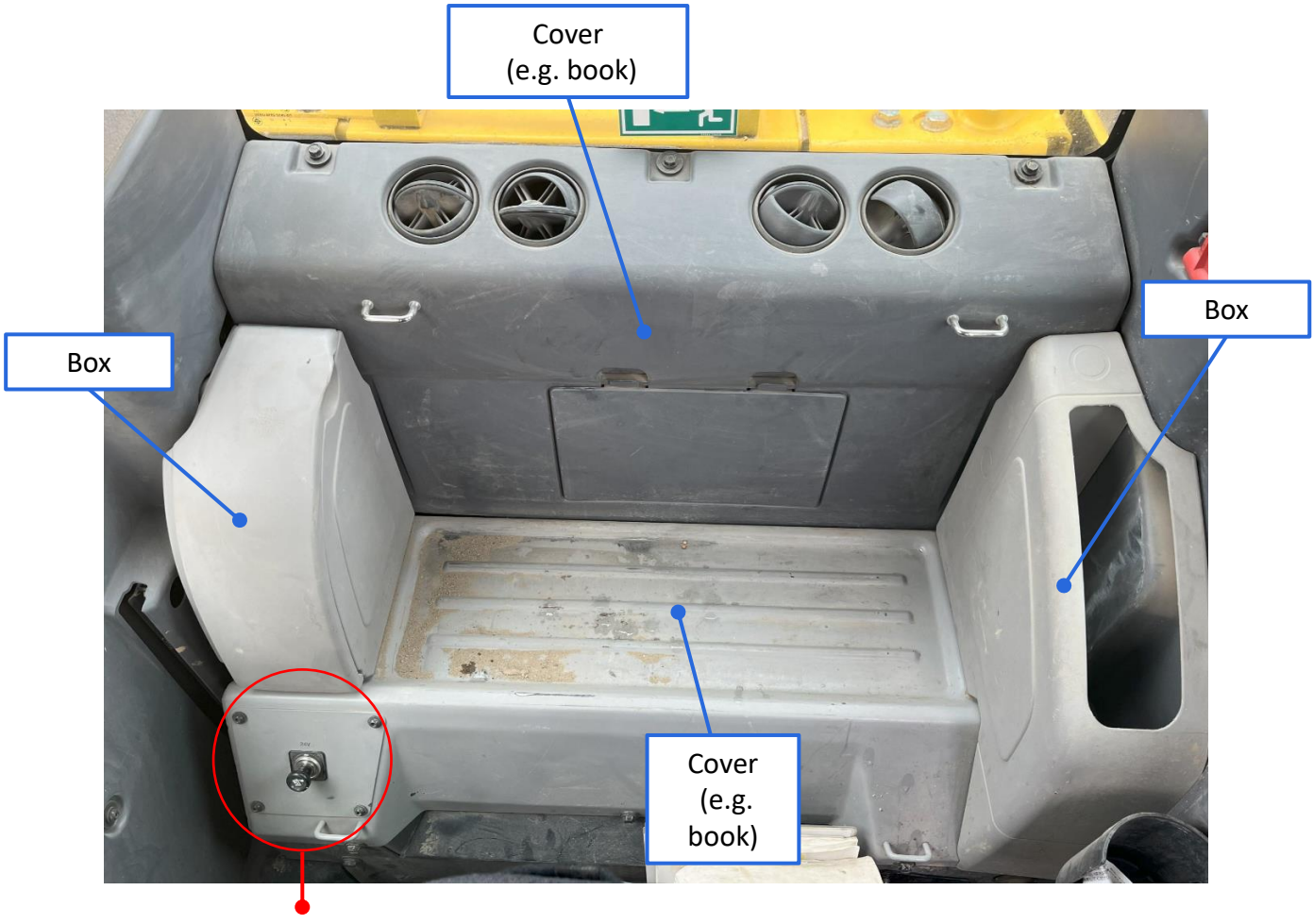
3.2 Installation of the connection harness (between DCDC converter and vehicle body)

note
When using tools, always use standard tools. Always use the correct torque for tightening work. There is a risk that parts may be damaged.

3.2.1 Removing the covers behind the cab

*Picture shows PC200-11. Please note that the parts to be removed are different for each vehicle.
Also, the intermediate connector (for DCDC converter) may be exposed in the cab. Please refer to the shop manual before carrying out the work.

All covers and boxes must be removed below.

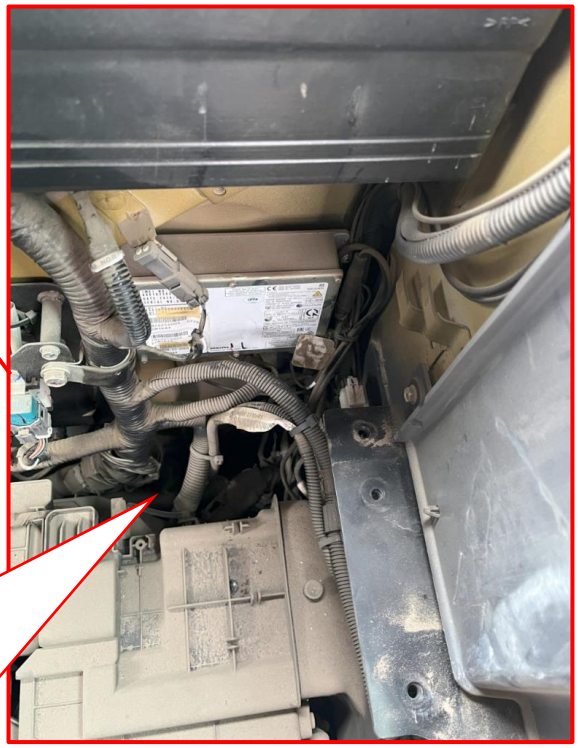


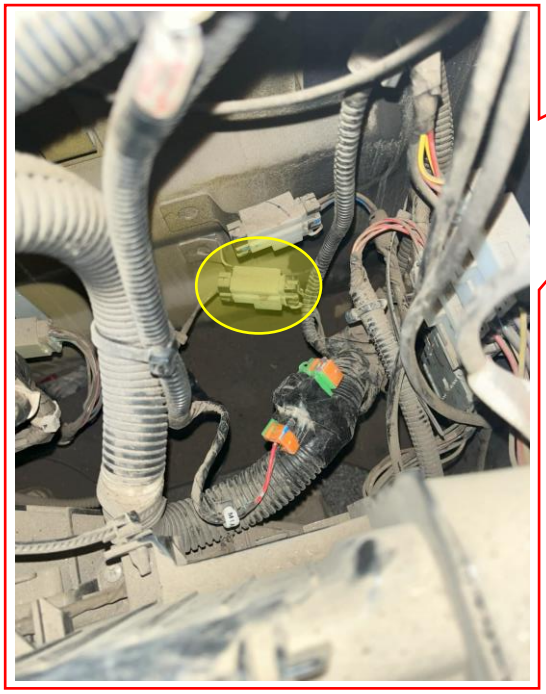
The connector for the cigarette socket is connected, take care not to disconnect it.

3.2.2 Finding connectors for connecting DCDC converters

There is a connector for connecting a DCDC converter in the following position.

Cab rear lower right.





PC200-11,
M09: Optional power supply (1).
The connector is circled in yellow in the image.
Please note that the connector number and on-board position may differ for each model.

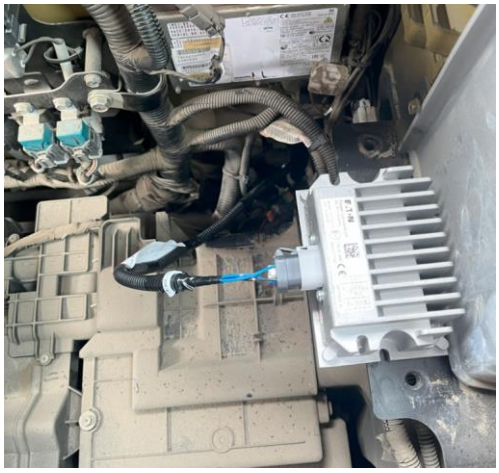
3.2.3 Installation of this kit on the vehicle side connector

The image is to insert this kit harness into the vehicle body side.

(1) Disconnect connector M09(Optional power supply) on the vehicle body side.

(2) Connect the kit wiring harness to the disconnected connector M09.

M09A: Input side (24 V), M09B: Output side (12 V)



(3) Install DCDC converter to the kit wiring harness (DT 6-pin female side) .

3.3 Fixing the DCDC converter/the connection harness and restoring the car body

3.3.1 Fixing the DCDC converter

Some models and specifications, such as PC200-11, may specify the mounting points for the DCDC converter. (M6 bolts× 2)
If mounting points are not specified, consult with the dealer and fix the DCDC converter.

Implementation Photo:

3.3.2 Fixing the connection harness

Fix the connection harness using the band. Check that there are no kinks in the harness.
The fuse holder must be secured to prevent vibration.

3.3.3 Restoration of removed covers

Any covers or boxes that have been removed should be restored to their original state.
This completes the installation of the kit.
Please check that the SC 3DMG controller is working properly and that there are no problems with the application connection.

4. Contact details.

■ For enquiries about products and defects, contact

EARTHBRAIN Ltd.
Support website enquiry:
https://support.smartconstruction.com/hc/requests/new
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