SUDEXPRESS®
scale model trains

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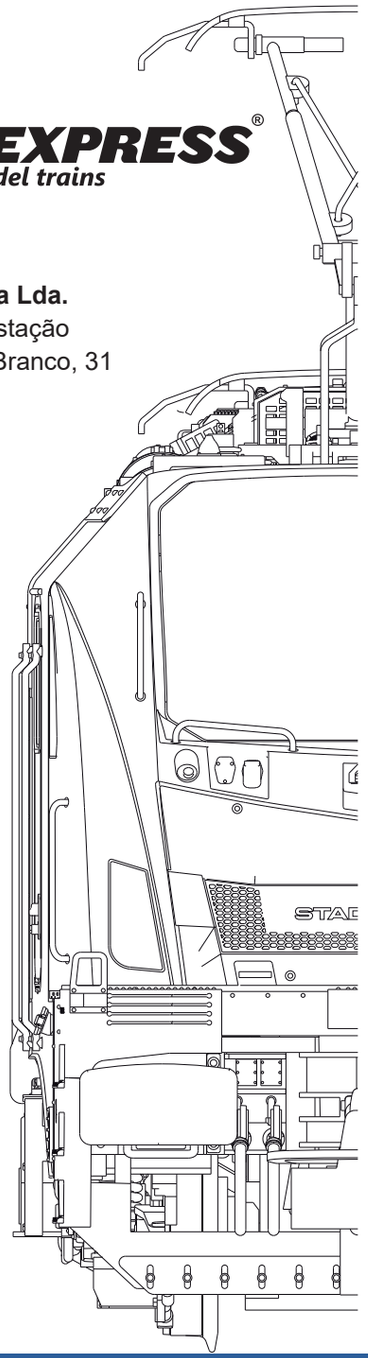


Pantograph Motorization

All EuroDual models are ready to be retrofitted with our pantograph motorization kit Ref. SUD3159 (sold separately).

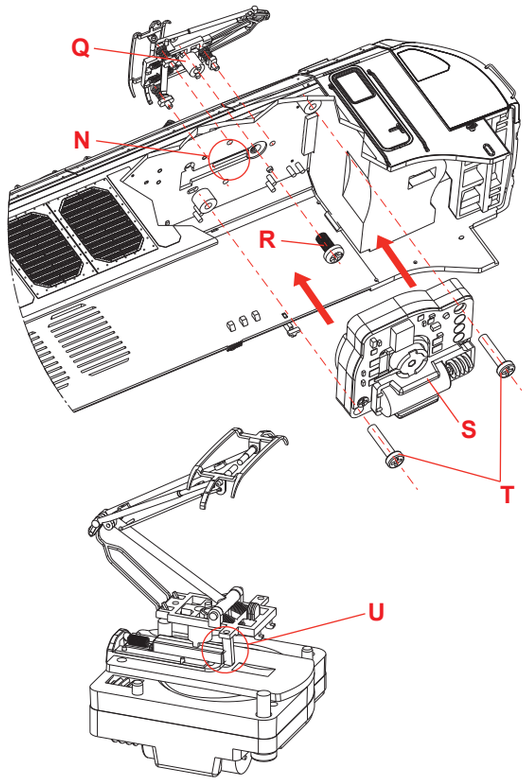
This kit contains two special pantographs, two servomotors and respective mounting screws and can be purchased directly from Sudexpress or via your reseller.

This kit will only function with a compatible digital decoder.

To install a pantograph please follow first the instructions in **fig. 1** to open the model. Then unscrew the stock pantograph and remove the cover part to expose the roof slot "N" (**fig. 5**). Assemble the new pantograph "Q" and the re-screw "R". Put the servomotor “S” in place and screw the two supplied screws “T” in the kit. Make sure that the pantograph arm and the servo leading slide are mounted as shown in "U". Finally, connect the wire harness to the connectors on the main PCB board.

The installation instructions described above apply to both pantographs.

5.



Accessory and Detail parts

Some extra detail parts (”V”) like brake hoses, coupler and closed front track clearer/snow plow (”X”) are included in a small bag. They can be assembled like shown in **fig. 6**. Please bear in mind that these details may hinder the proper functioning of the NEM coupler box “W”. For the use of closed track clearer/snow plow the complete removal of the NEM coupler box is required.

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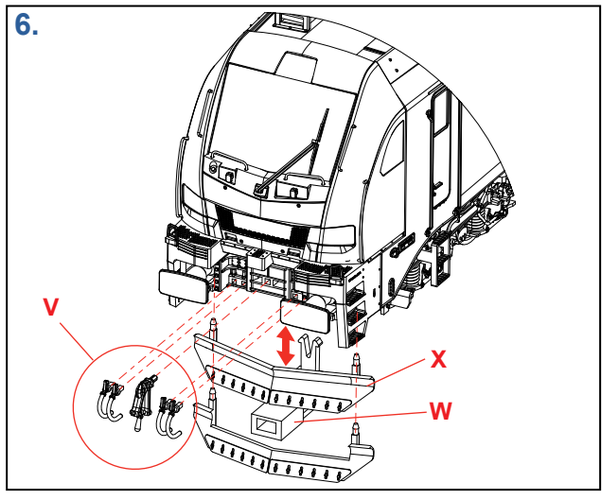

DCC functions

Listed bellow are the main DCC Sound functions from the ESU LokSound Project. For a more comprehensive list and further details please consult the official ESU bulletin (97459, Version: V3-R1).
Please check the Sudexpress webpage (https://sudexpressmodels.eu/) or the ESU webpage (https://www.esu.eu/) for any sound project update. Newer versions with improvements or added functions may be released in the future.

Key - Function
F0 - Front light
F1 - Sound on/off (diesel mode), ventilator fan On
F2 - Air horn (high)
F3 - Air horn (low)
F4 - Sound on/off (electric locomotive mode)
F5 - Heavy load
F6 - Acceleration/brake time, shunting mode/shunting speed
F7 - Curve squeal
F8 - Turn off third head light (directional)
F9 - Compressed air let off
F10 - High beam
F11 - Coupler clank
F13 - Cab light (directional)
F18 - No diesel radiator fan when F1 is ON
F20 - Turn off red head lights (directional)
F22 - Cab activation
F25 - Sanding valve
F30 - Disable brake squeal sound
F31 - Switch flange (also random)

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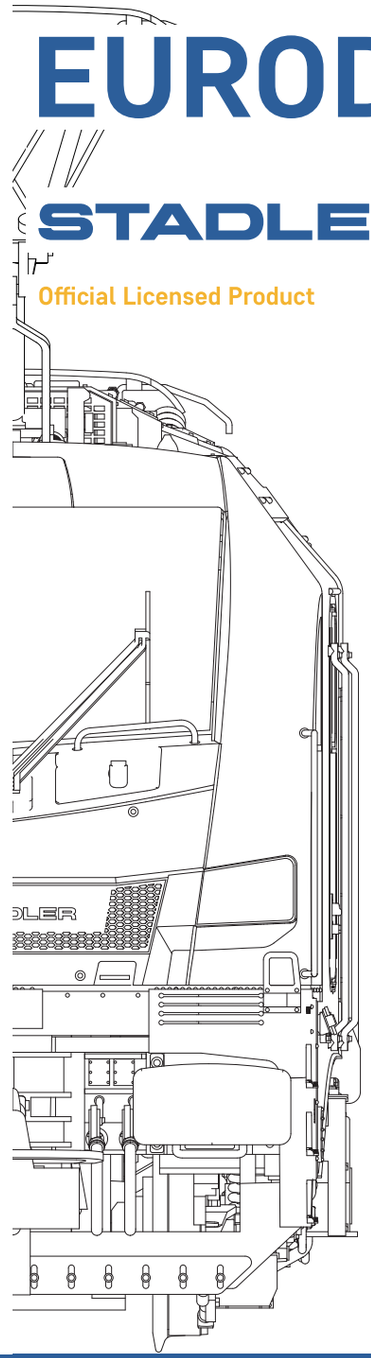

User Manual

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Historical Background

The EuroDual is a dual-mode locomotive designed with both an electric and a diesel-electric drive, which means that it can be used on both electrified and non-electrified railway lines. These locomotives are built by Stadler Rail Valencia and heavily derive from the diesel Euro4000 and EuroLight series by Vossloh Rail Vehicles, a company purchased by Stadler Rail back in 2015.

The EuroDual comes in a four or six-axle configuration for standard, broad and narrow gauges. Since it is often necessary that locomotives may have to run on non-electrified lines in order to operate on branches and secondary routes, the EuroDual has been developed for that very purpose as it possesses a high tractive force in both drive modes and can reach a maximum speed of 160 km/h. As the EuroDual can be deployed on all railway lines, it gives rail operators the chance to plan with greater flexibility and to save on transport costs. The EuroDual meets all the requirements of the TSI (Technical Specification for Interoperability), as well as European emissions limits at stage IIIB.

In 2017, private German operator Havelländische Eisenbahnen (HVLE) ordered 10 locomotives from Stadler with an option of further 10 units. Through this order, HVLE became the launch first customer for the EuroDual. Designated as the Class 159, these locomotives have traction on all six axles, a maximum continuous power of 7 MW (electric) and 3 MW (diesel) and the starting tractive effort can be as much as 500 kN. This variant features AC traction motors and separate IGBT converters for each axle. The diesel engine is a Caterpillar CAT C175-16 rated at 2800 kW. It features the latest ETCS Baseline 3 train protection system and legacy PZB for the German network.

Shortly thereafter HVLE contract, a major order for 30 EuroDual, accompanied by an option for 70 more, was placed by the Swiss rolling stock leasing company European Loc Pool (ELP). The first batch of ten locomotives is configured initially to be certified for use in Germany, although there are plans to seek approval for operations in other countries, including Norway and Sweden. Their maximum speed is to be restricted to 120 km/h, although it shall be possible to regear them for 160 km/h if the operator desires to do so.

During late 2018, another operator, ITL Eisenbahngesellschaft GmbH (Captrain Deutschland), placed an order for 10 EuroDual configured for use on the German railways.

Length over buffers:	23020 mm
Height:	4290 mm
Width:	2900 mm
Axle Configuration:	Co'Co'
Gauge:	1435 mm/1668 mm
Wheel diameter:	1067 mm
Loco weight:	123 t
Power:	6150 kW (AC+3 kV DC) 4100 kW (1,5 kV DC) 6000 kW (DC+Diesel) 2800 kW (Diesel)
Starting tractive effort:	500 kN
Max Speed:	120 – 160 km/h
Prime mover:	Caterpillar CAT C175-16
Transmission:	electrical AC/AC type, ABB
Fuel capacity:	3500 l
Electric system:	15 kV, 16,7 Hz ~ 25 kV, 50 Hz ~ 1,5 kV = 3 kV =

Initial Handling

Read the instructions carefully before using the model.

Carefully remove the locomotive from the plastic blister and wrapping. Keep the box and instruction sheets for future reference.

Use a transformer as power supply (not included) which corresponds to the EN 61558-2-7 standard.

Let the model run for approximately 30 min, both ways, at half speed, to make the motor and gears run smoother.

Please make sure, that your tracks are correctly mounted and well cleaned. Otherwise the model may not run properly.

The smallest curve radius the model can run on is 358 mm.

Disassembly

Gently release the body shell tabs "A" from the metal chassis like shown in **fig. 1**. Remove the body in an upward movement like shown in "B".

In order to replace wheel-set (**fig. 2**), for **AC models**, release the 6 tabs of the bogie cover, marked with "C". For **DC models** please unscrew the 3 screws marked with "D". When reassembling the wheel-sets please be sure not to damage the pickup contacts "E".

All models have a factory installed speaker. How to access the speaker "F" is shown in **fig. 3**. Please unscrew both "G" marked screws to release the main PCB board "H" and to gain access to the speaker itself behind. Remove the two small screws that assemble the speaker box to the metal chassis.

Converting to Digital

Have you bought a DCC model with sound or an AC model? Then the loco comes already with a decoder installed (ESU LokPilot in case of AC Models). Our factory installed decoder is already setup and fully functioning, so no extra work or steps are required.

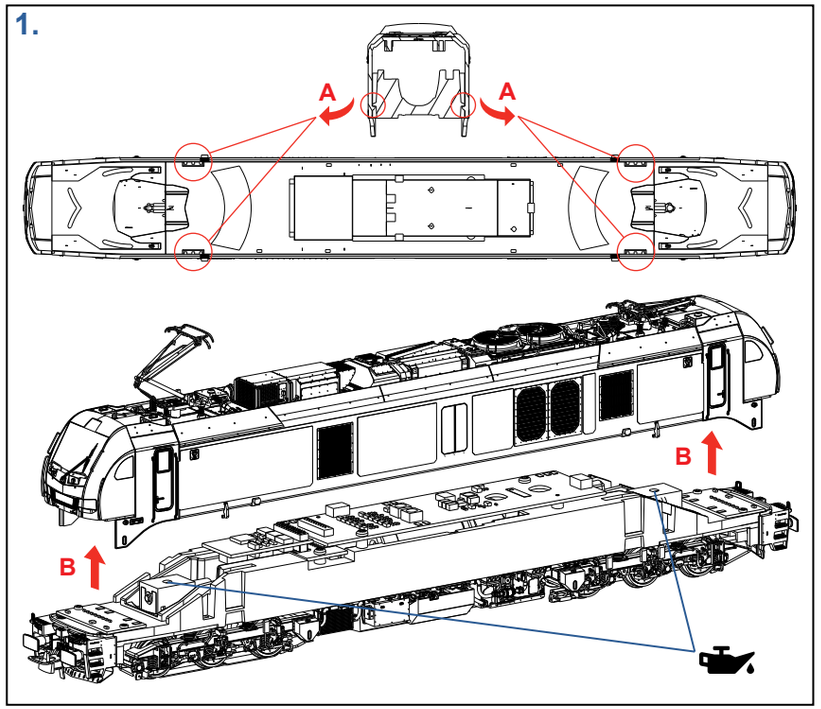
To convert an analogic version into digital please keep in mind that a special programming is required on the decoder to enable all the functions for this model. Therefore we recommend the compatible ESU LokSound 5 (97459) or LokPilot 5 (97659) decoders. For the use of ZIMO decoders, a special new adapter board ADAPLUMTC was created. For more informations please check out ZIMO's homepage at (http://www.zimo.at/).

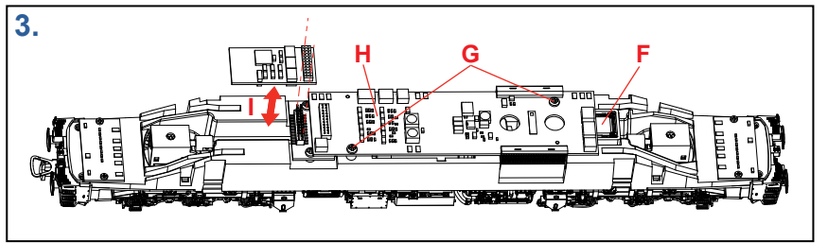
Decoder Installation

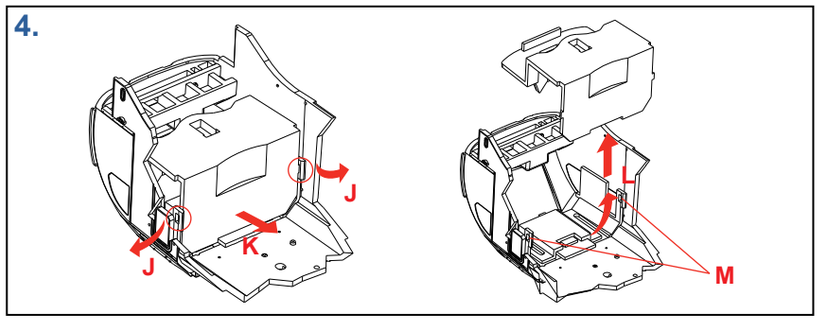
Remove the body first (**fig. 1**), then remove the installed dummy decoder and replace it with a compatible 21 pin MTC decoder like shown in "I" (**fig. 3**).

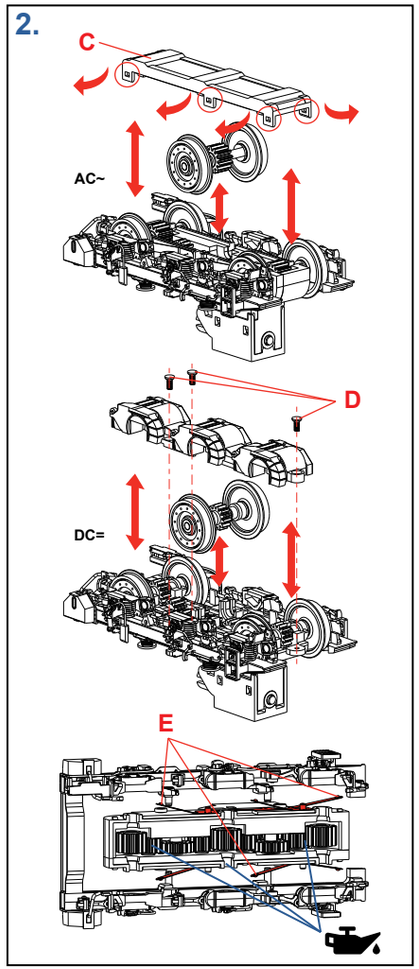
Maintenance

It is recommended to service the loco on a regular basis after every 40 hours of usage. When servicing, carefully clean the rails and wheels with adequate cleaning products.









Also clean the inside contour of the wheels and use a small brush to remove dirt from the pickup contacts "E" if necessary (**fig. 2**). Lubricate the axle bearings using oil and apply grease to the gears (**fig. 1** and **fig. 2**).
All the required products for maintenance can be found at any model shop.

Cabin Disassembly

Carefully release the tabs "J" from the glass part and then pull out the cab as first shown in "K" and then up like in "L" (**fig. 4**). Please use extreme caution to avoid breaking the small assembly lugs "M" of the cabin glass part.