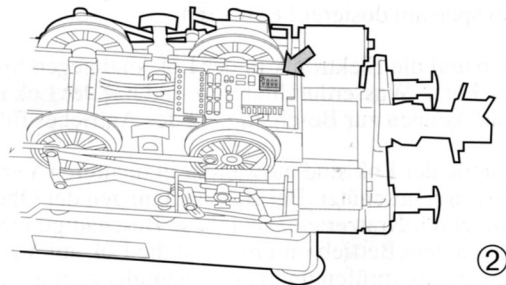
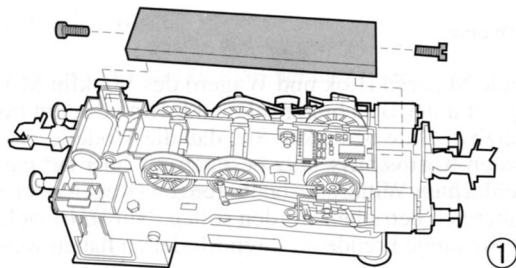


This locomotive can be run on track with a radius of at least 600 mm (23-5/8"). It is designed for operation on two-rail track with a gauge of 45 mm (1-3/4").

As delivered from the factory the locomotive is set for operation with alternating current. The locomotive can be controlled with Märklin DELTA or Digital by resetting switches on the electronic circuit plate. A special electronic circuit plate must be installed (included with the locomotive) for operation with direct current.

Switching to DELTA / Digital operation

1. Remove the cover plate for the mechanism on the bottom of the locomotive (ill. ①).
2. The desired DELTA or Digital address is then set on the electronic circuit plate (ill. ②).
3. Screw the mechanism cover back in place. Make sure that the electrical pickups between the first two axles are not pinched by the retainer plate!



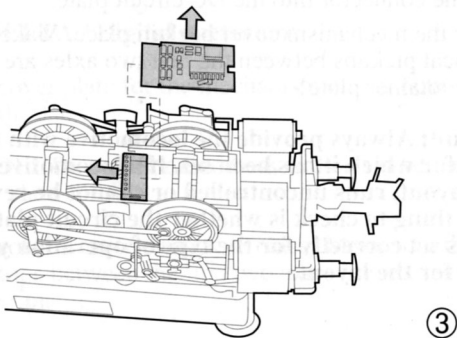
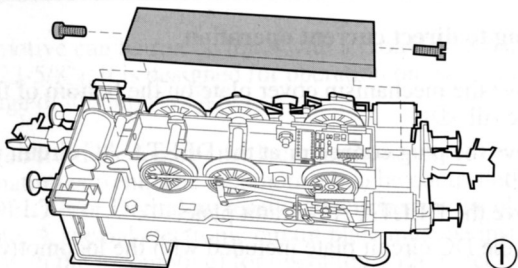
The following settings are possible:

Switch				
1	2	3	4	
off	off	off	off	Locomotive runs conventionally with alternating current
on	off	off	off	DELTA = address 1 / Digital = address 78
on	on	off	off	DELTA = address 2 / Digital = address 72
on	off	on	off	DELTA = address 3 / Digital = address 60
on	off	off	on	DELTA = address 4 / Digital = address 24
off	on	on	on	Digital = address 02
off	off	on	on	Digital = address 08
on	off	on	on	Digital = address 06
on	on	off	on	Digital = address 18
off	on	off	on	Digital = address 20
off	off	off	on	Digital = address 26
on	on	on	off	Digital = address 54
off	on	on	off	Digital = address 56
off	off	on	off	Digital = address 62
off	on	off	off	Digital = address 74
on	on	on	on	Digital = address 80

Switching to direct current operation

1. Remove the mechanism cover plate on the bottom of the locomotive (ill. ①).
2. Remove the plug connector at the DELTA AC circuit plate (ill. ③).
3. Remove the DELTA AC circuit plate.
4. Insert the DC circuit plate included with the locomotive into the plate mounting bracket.
5. Plug the connector into the DC circuit plate.
6. Screw the mechanism cover back in place. Make sure that the electrical pickups between the first two axles are not pinched by the retainer plate!

Important: Always provide the locomotive with the type of current for which it has been set. If a locomotive does not run on the layout, runs uncontrolled or cannot be reversed, then the first thing to check is whether the circuit plate in the locomotive is set correctly for the type of operation you have selected for the layout.



Operation with alternating current

When operating with alternating current using the TRANSFORMER 32 VA (no. 6647) or the 6606 locomotive controller, the speed control knob must first be turned to the zero setting to reverse the locomotive. After a short pause turn the speed control knob briefly to the left until you can feel that the knob cannot be turned further. Never go directly from a transformer speed setting where the locomotive is in motion to the reverse setting.

Operation with DELTA

Set the address selection switch on the hand controller to the DELTA address that has been set in the locomotive.

Turn the speed control knob from the zero setting to the right = locomotive is traveling forward.

Turn the speed control knob from the zero setting to the left = locomotive is traveling in reverse.

Operation with Digital

Enter at the locomotive controller (CONTROL UNIT 6021, CONTROL 80 f 6036) the digital address that has been set in the locomotive. The speed control knob must first be turned to the zero setting to reverse the locomotive. After a short pause turn the speed control knob briefly to the left until you can feel that the knob cannot be turned further. Never go directly from a transformer speed setting where the locomotive is in motion to the reverse setting. When the switch on the locomotive is set for "Digital 1", there is also a display on the locomotive controller with direction arrows which give information about the direction in which the locomotive is travelling.

Arrow pointing up – locomotive is traveling forward.

Arrow pointing down – locomotive is traveling in reverse.

Operation with direct current

The instructions that come with the DC power pack you are using will give information on how to operate a locomotive. The locomotive is designed for operation with 14–18 volts DC.

Functions in all types of operation

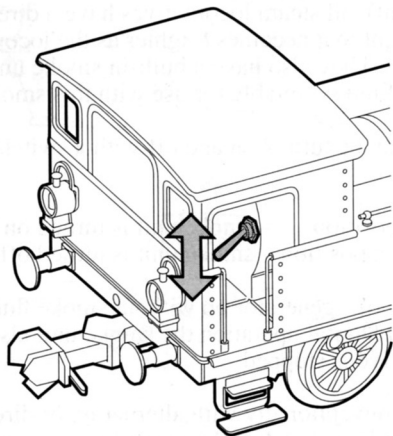
Except for the locomotive in the starter set (constant headlight only in the front according to the speed of the locomotive, no built-in smoke unit), all steam locomotives have a direction-dependent headlight that becomes brighter as the locomotive increases in speed. They also have a built-in smoke unit. The Märklin 0241 smoke fluid is suitable for use with this smoke unit.

The smoke unit can be turned on and off with a switch in the locomotive cab (ill. ④).

Switch in the up position – smoke unit is turned on
Switch in the down position – smoke unit is turned off

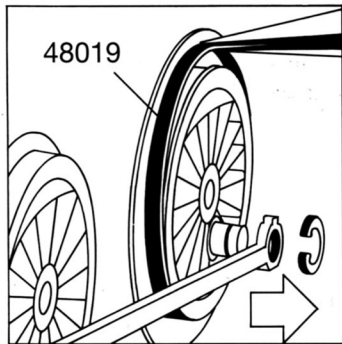
Never have the smoke generator on without smoke fluid in it. With DELTA and Digital operation the smoke unit also works when the locomotive is stopped.

When operating conventionally with alternating or direct current the smoke unit works only when the locomotive is in motion.

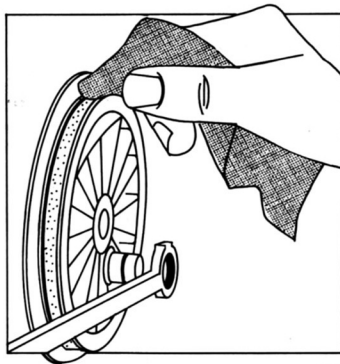


④

Changing traction tires



⑤



⑥

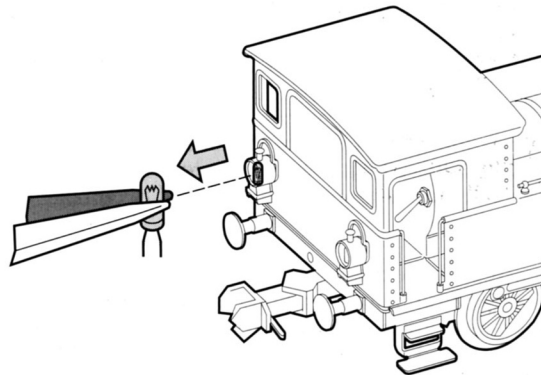
Changing smoke generators

The smoke generator is permanently installed with 2 power wires. Since soldering work is necessary to replace the smoke generator, we recommend that this work be left for an authorized repair station or for the Märklin Service Department to do.

Changing light bulbs

1. Pull the light bulb out of the socket.
2. Insert the new light bulb.

The lanterns on the locomotives are open in the front for easy replacement of the light bulbs. Suitable light bulb for all lanterns: no. 61 008.



⑦

Service Information

Please keep the following in mind when using the rolling stock (locomotive and cars) in the Märklin Maxi 1 program outdoors: These models have extensive protection against corrosion, but under no circumstances should they be operated outdoors during bad weather (rain or snow). This is the only way to insure that you can enjoy your train for years to come.

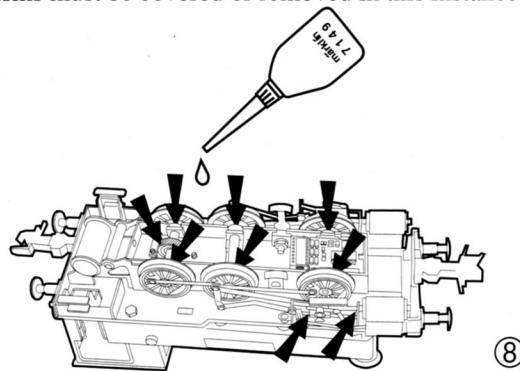
The axle bearings and the gear mechanism for the locomotive must be oiled after approximately 40 hours of operation. Only a suitable oil (Märklin no. 7149) should be used for this. Apply the oil sparingly! (ill. ⑧).

The mechanism and the electronics in the locomotive are protected against being sprayed with water. The locomotive cannot be run through water, and attempts to do can lead to damage to the mechanism.

The metal parts of the locomotive are protected against corrosion as the result of several painstaking processes. Scratches and other minor damages to these parts can be repaired. After the locomotive has been operated outdoors, it should be checked for dirt accumulation and should be cleaned. Moisture on the locomotive

should be removed. The locomotive should be cleaned with a dry cloth only. Never attempt to clean the locomotive with running water!

Märklin 1 Gauge track can also be set up outdoors permanently. Regular cleaning of the track improves the electrical conductivity to the locomotive. When an outdoor layout is not used for long periods of time, then the track should be wiped with a rag dipped in oil after each operating session to protect the rails. Turnout mechanisms must be covered or removed in this instance.



⑧