ERL MAINTENANCE SUPPORT SDN BHD

Co. Reg. No. 199901023674 (498574-T)

E-MAS

Effective Railway Operations; Reliable System Maintenance

ROLLING STOCK DEPARTMENT

TRAIN ELECTRICAL COUPLING PROCEDURE

Ref. No. G00.OMR.M92181.BT.0001.C

Release

Released:	Thomas Baake	Chief Executive Officer	06.4.21	
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Author:	Sahar Effizan	Rolling Stock	25/3/21	
	Name	**Department**	**Date**	**Signature**

Amendments or additions to this procedure must be indicated with a vertical black line in the adjacent left margin.

Change Record and Configuration Control

C	22-Mar-21	Updated to new procedure template & format. Incorporated a new train electrical coupling procedure into this procedure. This procedure supersedes the previous procedure i.e., Train Electrical Coupling Procedure with reference no: **G00.OMR.M92181.BT.0001 B**	Sahar Effizan
B	03-Aug-16	Updated to new procedure template & format, all the main contents of the procedure are remain unchanged. The title also renamed from Train Automatic Coupling Procedure to Train Electrical Coupling Procedure	Sahar Effizan
A	29-Jan-08	New	Roslan
Revision	**Date**	**Modification**	**Name**

Planning Of Changes Reference For Revision: G00.OMR.M92181.BT.0001.C					
Issues To Consider	**Checked** ***(Please mark X)***				**Remarks**
1) Are there any negative impact?	YES		NO	X	
2) Will the integrity of QEMS be affected?	YES		NO	X	
3) Resources available?	YES	X	NO		
4) Allocation or relocation of responsibilities and authorities required?	YES		NO	X	

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1 Purpose

The purpose of this Train Electrical Coupling Procedure is to provide a guideline for electrical coupling (if applicable) during failed trains rescue on mainline, terminal, and intermediate stations or at the depot area. This procedure explains the process of train electrical coupling and uncoupling in a safe manner. All relevant parties must comply with this guideline and Electrical coupling shall not be carried out if the train is experiencing;

a. Main Reservoir Pressure (MRP) loss [Emergency Brake loop trip]

b. Batteries flat [Pantograph unable to be raised]

c. Fault “A” [related to brake and pneumatic]

2 Scope, Distribution & Access

This procedure is applicable to all RST and OPS, and shall be followed accordingly whenever applicable.

This procedure is accessible to all E-MAS staff via RST Portal [http://e-masportal.com/erl/organization-department.php?id=19] and also could be viewed and retrieved via EDMS. The hardcopy of this procedure is available in the RST foreman room for reference. Full access for editing this document is only granted to the RST management team.

3 Abbreviation and Definition

ATC	Automatic Train Control
ATP	Automatic Train Protection
EDMS	Electronic Document Management System
E-MAS	ERL Maintenance Support Sdn. Bhd. (Co. Reg. No. 19990102367(4498574-T))
ET-01	Train Siemens Desiro ET425M
ET-02	Train CRRC ET Series 2 (China)
DDU	Driver’s Display Unit
OCC	Operations Control Centre
OPS	Operations Department
OTD	Operations Train Driver
RST	Rolling Stock Department
SAS	Safety and Security Department
*	To refer to the latest version

4 Procedure

The procedure includes the electrical contact, which will enable the rescue train to activate the brake system on the failed train. The activation of automatic train coupling will be referred to as electrical train coupling throughout this procedure.

The coupling of a train without the electrical contact is also known as Mechanical Coupling and the procedures are described in Procedure for Train Driver, G00.OMO.M15113.NA.1004.*.

4.1 Safety Precautions

Item to be observed during electrical coupling and uncoupling process;

a. Keep a safe distance of at least 1 meter from the mechanical head as the couplers might swing out abruptly when mating on curves.
b. Keep off the swiveling range of the electric heads, as the protecting lids of the electrical heads are automatically open and close.
c. Do not touch contacts of the electric heads if the electric heads do not lay close to each other, move cars apart and couple again.
d. Keep sufficient safety distance of at least 1 meter when uncoupling and moving cars apart as the coupler may push forward and swing out if they are under tensile force when uncoupling.
e. This electrical coupling only can be performed with the same train origin (ET-01 with ET-01 and ET-02 with ET-02 only)

4.2 Preparation for Train Electrical Coupling

Prior to rescuing a failed train, a few steps of preparation on both trains (the rescue train and the failed train) shall be adhered and all safety measures shall be taken without fail. The pre automatic coupling steps are as follows;

4.2.1 General preparation on failed and rescue train

Ensure the coupler on failed and rescue train is in ready-to-couple position, which could be identified by the following conditions:

a. The coupling links lie at the edge of the male cone, refer to Figure 1 (ET-01) & Figure 1A (ET-02).

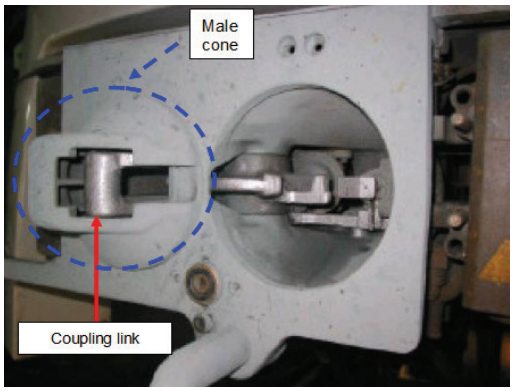

Figure 1: Front view of the Coupler Head

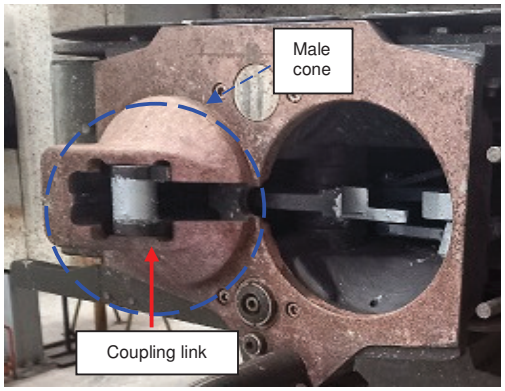

Figure 1A: Front view of the coupler head

b. The coupler's electrical contact box head - protecting lids are in a closed position refer to Figure 2 (ET-01) & 2A (ET-02).

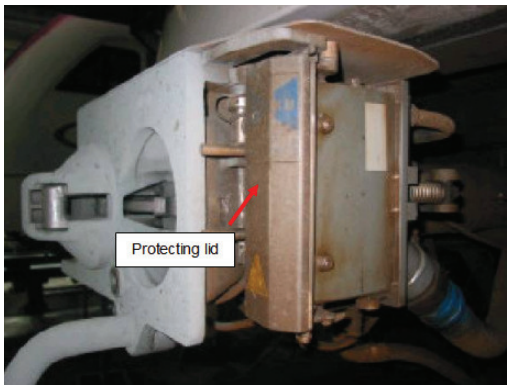

Figure 2

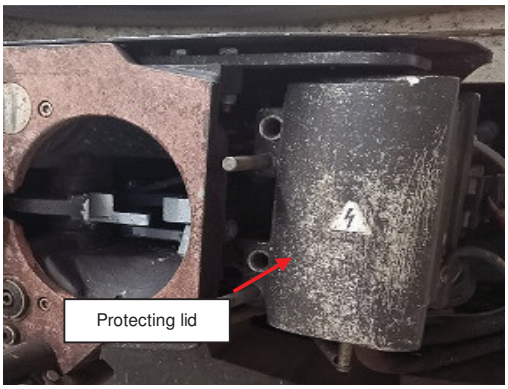

Figure 2A

Figure 2 & 2A: Protecting Lid of the Electrical Contact Box Head in close position.

c. In case the coupler locks are not in the ready-to-couple position, refer to Figure 3(ET-01) & 3A(ET-02), the manual de-coupler device bar should be turned clockwise in order to be at the ready-to-couple position for ET-01 and the manual de-coupler for ET-02 to pull out the manual handle horizontal refer to Figure 4(ET-01) & 4A(ET-02).

Figure 3.

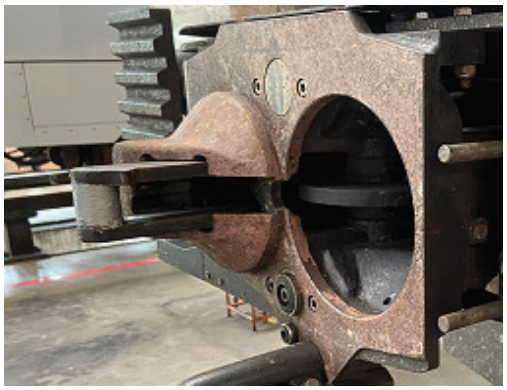

Figure 3A.

Figure 3 & 3A: Coupling link not inserted

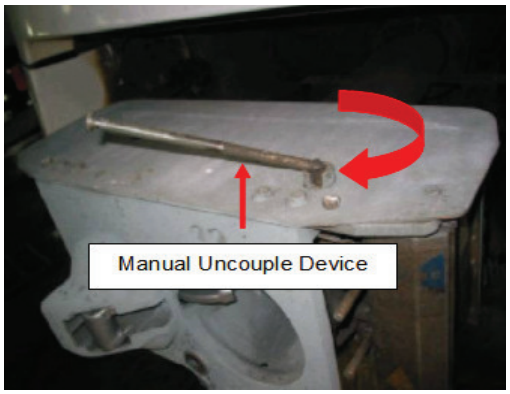

Figure 4.

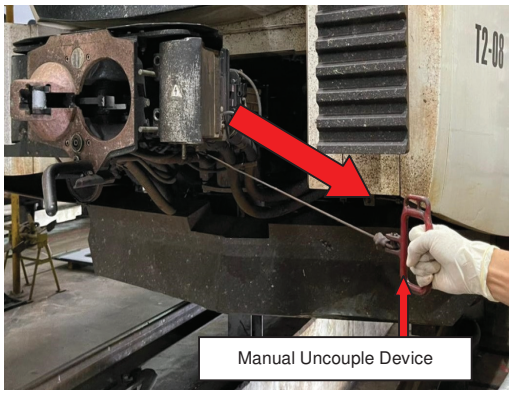

Figure 4A.

Figure 4 & 4A: Manual De-coupler device ready-to-couple position

Reminder!
Ensure the mating surfaces of both couplers are free from foreign objects.

4.2.2 Preparation on the failed train:

a. The preparation is separated into 2 sections:
   i. From inside the driver cab.
   ii. Physical check on the coupler.

b. Items to be checked and done from inside the driver cab are the following:
   i. Switch OFF all Main Components and lower the Pantograph.
   ii. Leave the train Battery in ON condition.

iii. Ensure Parking Brakes is in 'APPLY' condition.

iv. Ensure all train doors in 'CLOSE' condition

v. Un-occupy the active cab and remove the Master key.

c. Items to be checked/done on the coupler are the following:

i. Ensure the Main Isolation Valve is in the vertical position for ET-01 and ON position for ET-02, refer to Figure 5 for ET-01 and Figure 5A for ET-02.

ii. Ensure the Coupler isolation valve for the electrical box is in the horizontal position for ET-01 and 'ON' position for ET-02, refer to Figure 6(ET-01) & Figure 6A(ET-02).

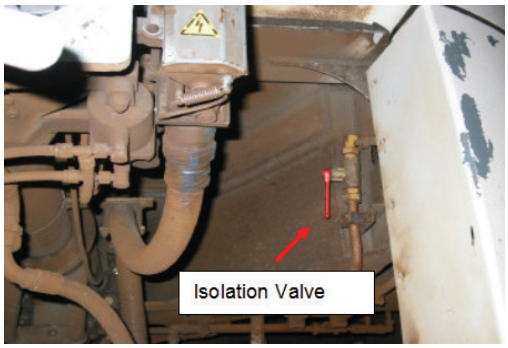

Figure 5.

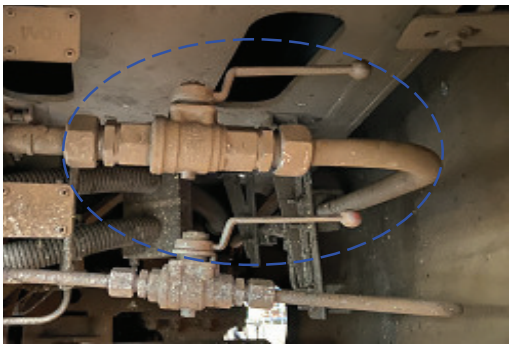

Figure 5A.

Figure 5&5A : Main Isolation Valve in On position for both ET-01 & ET-02

4.2.3 Preparation on the rescue train

The rescue train shall stop approximately 3 meter from the train to be rescued. After applying the Parking Brake, the following should be check:

a. Ensure the Main Isolation Valve is in the vertical position for ET-01 and 'ON' position for ET-02, refer to Figure 5(ET-01) & Figure 5A(ET-02).

b. Ensure the Coupler isolation valve for the electrical box is in the horizontal position for ET-01 and 'ON' position for ET-02, refer to Figure 6(ET-01) & Figure 6A(ET-02).

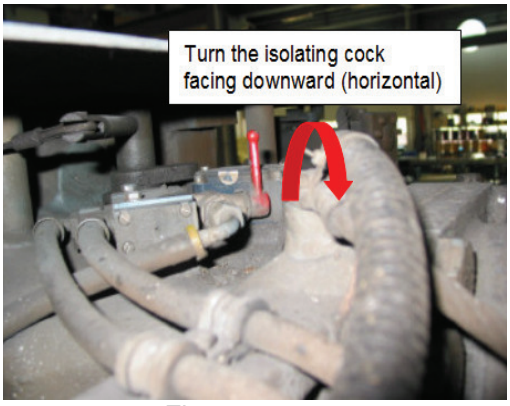

Figure 6

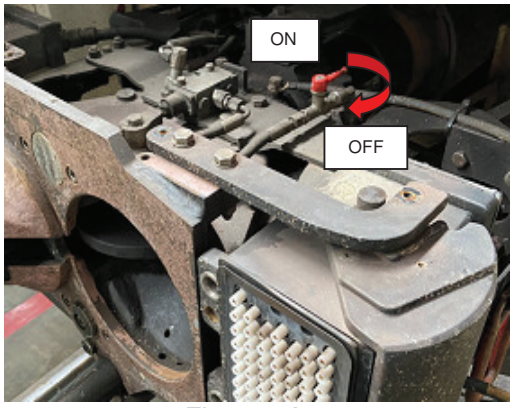

Figure 6A.

Figure 6&6A: Coupler Isolation Valve.

Note:
No changes in ATP Train data are required.

4.3 Electrical Coupling

After all the items mentioned in Section 4.1 are checked and performed, the electrical coupling is now ready to be executed. Refer to the following sequence of s instructions;

a. Slowly move the rescue train against the failed train and ensure train traction percentage as detailed below:
   1. **ET-01**:
      I. Level & down gradient: cow horns are parallel (+5% traction)
      II. Up gradient track: cow horns are parallel (+10% traction)
   2. **ET-02,** press button Wash/ Coup Mode and speed restricted to 3 km/h before coupling
      I. Level & down gradient: cow horn are parallel (minimum 0.6 km/h)
      II. Up gradient track: cow horn are parallel (minimum 1 km/h)

b. Once both couplers are engaged and the electrical head contacted, the following message would appear on the DDU inside the active or coupled cab:
   1. **ET-01**:
      i. “Deactivate cab 100” (if the active cab is +100) or
      ii. “Deactivate cab 200” (if the active cab is +200)
   2. **ET-02**, coupler indicator on driver desk will illuminate

c. Deactivate the occupied cab and activate new leading cab

d. DDU at the new leading cab display will show the following:
      i. Configuration for 2 units of trains [Main Components, Air-condition, Lighting, Driving/Braking, State of Brakes, Doors and Voltage/Current].

e. Acknowledge the new train configuration (Two units) via DDU

f. Proceed slowly forward to confirm both couplers are intact and secured
      i. If the coupler disengaged when traction is applied, repeat all the above steps.
      ii. If the coupler remains in engaged conditioned, continue with the following steps:
         - ✓ Inspect that both electric contact box heads are connected.
         - ✓ Inspect the air pipe connections are tight and no hissing sound

g. Perform DDU short brake check and manual brake test (Apply for ET-01 only)

Reminder!
It is important to ascertain both couplers are engaged and secured

Note:
Train Driver may inform OCC that coupled train is success and awaiting OCC instruction to proceed.

4.4 Electrical Uncoupling

Electrical uncoupling is a function or method to uncouple the coupled train.

4.4.1 Uncoupling electrically

Electrical uncoupling can only be activated via train Master key for ET-01 at the coupled cab where the coupler is engaged and by pressing the uncoupling button for ET-02 of the rescue train

Refer to the following instruction:

a. Apply Parking Brake

b. Change cab, where the coupler is engaged

   I. **ET-01**, turn the cab master key anti clockwise towards the de-couple position until the coupler locks unlatch [detachable by a clicking noise]. If not possible, Manual De-Coupler Device to be used.

   II. **ET-02,** uncouple train by pressing the uncoupling button. If not possible, the manual de-coupler device to be used.

c. Reverse to uncouple the trains

d. Acknowledge train configuration at DDU

e. Perform DDU short brake check and manual brake test before moving

f. The uncoupled position is achieved if:

   i. The couplers electrical contact box heads are retracted and the protecting lids closed

   ii. The coupler knuckle locks have clicked open and released

   iii. Configuration for 2 units of trains in DDU disappears.

Reminder!
Parking Brakes of the failed train MUST be APPLIED after uncoupling