

**NEW EQUIPMENT AND SYSTEM
APPROVAL CERTIFICATE****Certificate No. S 02-1402-147**

Approval date 30/03/2015
Approved by Review Panel
Report no. TAS 02-1402-AL147
Report date 11/03/2015

This certificate is issued to

Supplier Specialised Force
131 Woids Avenue, Carlton,
NSW, Australia 2218

In respect of

Manufacturer ALDON
Product description 4014-01 & 4014-02 HINGED DERAILER
Item identification See Approved Item List.
Application Controlled derailment of rollingstock across the entire ARTC network
Relevant Standards SPS 02 Environmental Conditions

Conditions of Approval

1. Derailer to be based on performance needs and nominated performance limits.
2. 4014-01 or 4014-02 derailer to be used where maximum speed of rollingstock to be derailed does not exceed 13kph.
3. To only be used with lever operation. Manual operation is not permitted.
4. Derailer must be securely locked in either the normal position or reverse position at all times (must not be free to move when unattended).
5. Must be installed by competent installers in accordance with manual 'Instructions for installing ALDON Two-Way Locomotive Hinged Derail on wooden ties – rev 0423' or latter.
6. A ballast drag shall be installed with each Derailer in accordance with the Table for Ballast Drag Length.
7. Runaway Wagon speed for the siding must be calculated using an approved calculator to determine the design performance for the location.
8. Timber sleepers must be used.

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9. Only components from the attached may be utilised.
10. The derailer must be installed on the outside rail when the track is curved.
11. The derailer must be painted white using enamel high gloss paint.
12. Appropriate signs to be erected at each site, to ensure that operators are aware of the location of the derailers.
13. Derail sign must have a background colour of red.
14. All operators must be advised of the use of the derailing equipment via a Train Notice or equivalent.
15. When used in dual gauge track the following requirements are to be met:
 - a. To be mounted on common rail;
 - b. Check rail to be removed adjacent both common and dual gauge rails within one metre of the derail;
 - c. Derail is used in conjunction with ramp blocks to facilitate derail of BG wheel over SG rail as per JN0804-03 drawing;
 - d. Ballast drag length shall be installed as per Ballast drag table. The ballast drag shall be clean and flooded to the underside of the derailed side of the rail head to facilitate capture of the derailed wheels.

A general condition of approval is that the supplier remains accredited to ISO 9001 specifically for these products and ARTC is advised on a 12 monthly basis that accreditation is current. ARTC reserves the right to conduct its own audit of the manufacture and supply of these components to AS 19011.

Any subsequent change to the design, materials or manufacturing process is not covered by this approval. The manufacturer should notify ARTC of any modification or changes in order to obtain a valid updated certificate.

Note/Comments

Issue date

16 November 2015

Expiry date

N/A

Issued by



John Furness

ARTC Manager Standards

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Approved Item List

The following lists the individual items (by catalogue number) are approved for use on ARTC infrastructure under the above referenced New Equipment & System Approval Certificate number, subject to any conditions shown on that Certificate and the Conditions of Use shown against individual items.

For use in sidings - Max speed of 13kph only

Part number	Description	Includes
4014-01-5D	Left Hand Throw – Size 5	Derail Sign and Lever
4014-01-6D	Left Hand Throw – Size 6	Derail Sign and Lever
4014-01-7D	Left Hand Throw – Size 7	Derail Sign and Lever
4014-01-8D	Left Hand Throw – Size 8	Derail Sign and Lever
4014-02-5D	Right Hand Throw – Size 5	Derail Sign and Lever
4014-02-6D	Right Hand Throw – Size 6	Derail Sign and Lever
4014-02-7D	Right Hand Throw – Size 7	Derail Sign and Lever
4014-02-8D	Right Hand Throw – Size 8	Derail Sign and Lever

Rolling Drag Tabulation (Ballast Drag Length) ver 1.0

Number of Wagon(s)	1				2				3			
	15	20	25	30	15	20	25	30	15	20	25	30
2	10	10	15	15	10	10	15	15	10	10	15	15
4	10	10	15	15	10	10	15	15	10	10	15	15
6	10	10	15	15	10	10	15	15	10	10	15	15
8	10	10	15	15	10	10	15	15	10	10	20	20
10	10	10	15	15	10	10	20	20	10	10	20	20
12	10	10	15	15	10	10	20	20	15	15	25	25
14	10	10	20	20	15	15	25	25	15	20	25	30
16	10	10	20	20	15	20	25	30	20	20	30	30
18	10	10	20	20	15	20	25	30	20	25	30	35
20	15	15	25	25	20	20	30	30	25	30	35	40
22	15	20	25	25	20	25	30	35	25	30	40	40
24	15	20	25	30	25	25	35	35	30	35	40	45
26	20	20	30	30	25	30	40	40	30	35	45	50
28	20	25	30	30	30	30	40	45	35	40	50	50
30	20	25	30	35	30	35	40	45	35	40	50	N/A
32	25	30	35	35	30	35	45	50	40	45	N/A	N/A
34	25	30	35	35	35	40	45	50	40	45	N/A	N/A
36	25	30	35	40	35	40	50	N/A	45	50	N/A	N/A
38	30	35	40	40	40	45	50	N/A	45	N/A	N/A	N/A
40	30	35	40	45	40	45	N/A	N/A	50	N/A	N/A	N/A
42	35	40	45	45	45	50	N/A	N/A	50	N/A	N/A	N/A
44	35	40	45	50	45	50	N/A	N/A	N/A	N/A	N/A	N/A
46	40	48	50	50	50	N/A	N/A	N/A	N/A	N/A	N/A	N/A
48	40	48	50	N/A	50	N/A	N/A	N/A	N/A	N/A	N/A	N/A
50	45	50	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*1 Ballast drag length expressed in terms of metres (m)

*2 Where 'N/A' is shown, please contact ARTC for further information if required.

*3 Data based on runaway wagons only.

Asumptions		
Axle Load (tare weight)	20-30	tonnes
Ballast drag wheel depth	300	mm
Wheel Radius	457	mm
Grade of Run off	0	%

Rolling Drag Calculation (Ballast Drag Length) ver 1.0

V ^h	=D - Rolling Drag!E7/3.6	m/s
F ^v	=(D - Rolling Drag!E8/2)*9.81	kN per wheel
z	=D - Rolling Drag!E9/1000	m
r	=D - Rolling Drag!E10/1000	m
	=D - Rolling Drag!E11	
	=D - Rolling Drag!E12*D - Rolling Drag!E8*4	Mass of train
	=D - Rolling Drag!E13/100	

$$F_x = \text{=(Calculations!D5*(SQRT(Calculations!D6/2*Calculations!D7)))+(Calculations!D10*9.81)}$$
 kN retarding force per wheel

$$\text{=E13/(D - Rolling Drag!E8/2)}$$
 deceleration rate of derailed wheelsets (m/sec²)

$$\text{=(Calculations!D4*Calculations!D4)/(2*E14)}$$
 metres

$$a = \frac{F}{m}$$

Distance for an individual wheel $s = \frac{v^2}{2a}$

Distance (m)	
0	=AND('D - Rolling Drag!G19=0,'D - Rolling Drag!G18>=0)
10	=AND('D - Rolling Drag!G20=0,'D - Rolling Drag!G19>=0)
15	=AND('D - Rolling Drag!G21=0,'D - Rolling Drag!G20>=0)
20	=AND('D - Rolling Drag!G22=0,'D - Rolling Drag!G21>=0)
25	=AND('D - Rolling Drag!G23=0,'D - Rolling Drag!G22>=0)
30	=AND('D - Rolling Drag!G24=0,'D - Rolling Drag!G23>=0)
35	=AND('D - Rolling Drag!G25=0,'D - Rolling Drag!G24>=0)
40	=AND('D - Rolling Drag!G26=0,'D - Rolling Drag!G25>=0)
45	=AND('D - Rolling Drag!G27=0,'D - Rolling Drag!G26>=0)
50	=AND('D - Rolling Drag!G28=0,'D - Rolling Drag!G27>=0)