Service Bulletin

Preventive checks of components which can have an impact on the driving behavior

Task

Timing	Category	Scope
Next service as agreed with customer	(•) Apply at all sites ( ) Apply at affected sites as listed below ( ) Optional to improve functionality of product	Problem Record: PRB0058254 PRB0060505

Task Tracking

After completion of your task the following entry in your Service Report is required: **DD+DIS015.18E** *

* Insert the document number into the field "Comment" (SMS form).

Purpose of this document:
It describes some additional design improvements that have been released.

Affected serial number(s) / batch: This action should be done at next service intervention at all sites.

The signatures on the approval page indicate the solutions described in this Service Bulletin have been reviewed and are NOT reportable because no actions are taken to reduce a "Risk to Health" according to our risk assessment process.

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1 Introduction/purpose

The following components which can have an impact on the driving behavior of the DX-D 100 / DX-D 100 Wireless must be checked/replaced during next maintenance/preventive maintenances:

Topics:	**Check:**
• Voltage of the gauges	Applicable for all units!
• Tension of the drive chain and look for possible dirt/dust	Applicable for all units!
• DMC board and firmware version	Applicable for all units!
• Parking lock	Applicable for all units!

Components:	**Replacement:**
• Arrestor	Regardless of the condition discharger of arrestor needs to be replaced during preventive maintenance. If the arrestor kit is not the new design (with metal plate + resistors+ iron wire) replace it with latest Arrestor Resistive Kit.
• Front and rear wheels	Only recommended for sites which are suffering a lot with electrostatic discharges (a lot of different floor types …).
• Deadman bar	Only when deadman bar is damaged it needs to be replaced with the new design.

For detailed instruction, refer to section 3 Instructions.

2 Prerequisites

SOFTWARE:

In case firmware **below** V11R3b**5** is present on an installed DMC board revision “H”:

- Download the DMC firmware V11R3b5 (mandatory) or V11R3b7* from the Agfa HealthCare Library:
  Direct Radiography > DX-D 100 > DX-D 100 Generic

Observe that a DMC Programming cable is required for firmware upgrade.
It has to be ordered if not present, see Spare Parts below.

*** NOTE:**

DMC firmware V11R3b7 improves the DX-D 100 driving behavior. The installation of version V11R3b7 is not mandatory but recommended in case of issues.
Refer to DX-D 100 - SB076 - Introduction of DMC firmware version 11R3b7, Document ID 52181220.

SPARE PARTS:

Order the following tool via Agfa spare parts channel:

To be replaced during preventive maintenance	
• Discharger:	SC+27893-01 Rev C
Only applicable if one of the checks is failing:	
• DMC board: For DX-D 100 / 100 Wireless units with installed DMC board with **a revision lower than “H”**, order the following kit: ○ Digital Motion Control V11R3b5 consisting of - DMC board rev H with firmware V11R3b5 already loaded - buzzer - instructions - tie wraps	SC+A521079-03
• Cable to upgrade firmware on DMC board: Only in case the firmware needs to be upgraded and the programming cable is not present, order the following kit: ○ Upgrade dig. mot. control V11R3b5 consisting of - Windows Serial Downloader Program on CD ROM - DMC firmware V11R3b5 - DMC Programming cable	SC+A521065-05

Condition based (related to outcome of checks) refer to previous page):	
• Arrestor Resistive Kit:	SC+A9365-01 Rev B
• Switches Drive Handle:	SC+A521028-03
• Front wheel kit (2 kits):	SC+A8034-03
• Front wheel (1 unit):	SC+53810063
• Rear wheel (2 units):	SC+1951801003

TOOLS:

- Service PC with serial port or USB to serial port (RS 232) converter
- HyperTerminal software on Service PC
- Oscilloscope or Voltmeter (DC)
- Dynamometer (spring scale, mechanical or electronic), to measure force in the range of 25 N to 35 N (2.5 to 3.5 kg)

Figure 1

REFERENCED DOCUMENTS:

- DX-D 100 / DX-D 100 Wireless - Mobile X-Ray Unit - Service Manual, 41600560
- DX-D 100 - SB076 - Introduction of DMC firmware version 11R3b7, Document ID 52181220

3 Instructions

REQUIRED TIME:
Depending on the required activities, up to 2.5 hours

- 30 minutes: Checking Voltage of the gauges
- 60 minutes: Checking the tension of the drive chain
- 10 minutes: Checking firmware version of the DMC board
- 05 minutes: Checking parking lock
- 05 minutes: Checking arrestor
- 10 minutes: Checking deadman bar
- 10 minutes: New material for front and rear wheels
- 15 minutes: Verification
- 15 minutes: Informing the customer

3.1 Checking Voltage of the gauges

DANGER:
Keep the unit turned off and isolated from the power supply.
Although the mobile unit is off and disconnected from mains, dangerous voltage is present in the unit. Refer to “General Cautions” at the troubleshooting chapter of the DX-D 100 / DX-D 100 Wireless - Mobile X-Ray Unit - Service Manual.

(1) Perform a functional check of the gauges.

For instructions refer to DX-D 100 / DX-D 100 Wireless - Mobile X-Ray Unit - Service Manual - Troubleshooting, section 6.1 functional check.
Refer to Document ID 41600560

(2) In case the readings from the Oscilloscope or Voltmeter (DC) connected to either TP8 (right gauge) or TP10 (left gauge) are not correct; perform the troubleshooting gauges to determine the proper corrective action.

For instructions refer to DX-D 100 / DX-D 100 Wireless - Mobile X-Ray Unit - Service Manual - Troubleshooting, section 6.7 Troubleshooting Gauges.
Refer to Document ID 41600560.

3.2 Checking the tension of the drive chain

(1) Check the chain tension as described in the attached Service Information Note SIN 14-01-03, Adjustment chain in mobile.

03_Service Information Note_SI

Also check for possible dirt or dust.

(2) Remove the external covers from the unit. Visually inspect all major components for dust or foreign items. Search carefully to detect objects which might cause short circuits and for loose connections.

(3) If excess dust is present, clean the interior of the unit using a dry brush or vacuum cleaner.

3.3 Checking firmware version of the DMC board

Preparation: Removing power input for the NX PC:

(1) Shut down the system.

(2) Open the front cover.

(3) Disconnect power input of the NX PC.

For systems with DX-D 40 / DX-D 45: The SCU power supply needs to be removed to get access to the power input connector.

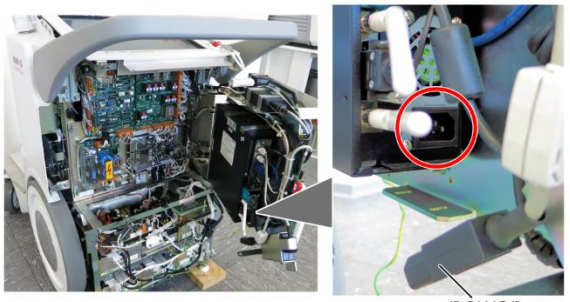

Figure 2

NOTE:

The system needs to be powered on and off.
With NX PC disconnected, the system can be powered off via emergency switch. This saves about 5 minutes per power on/off activity.

Hardware and Firmware check:

(4) Connect the **J8** connector of the DMC Programming Cable (A7130--xx) to J8 of the Digital Motion Control Board.

(5) Connect the other end (SubD9--PC) of the cable to the available COM Port of the service PC.

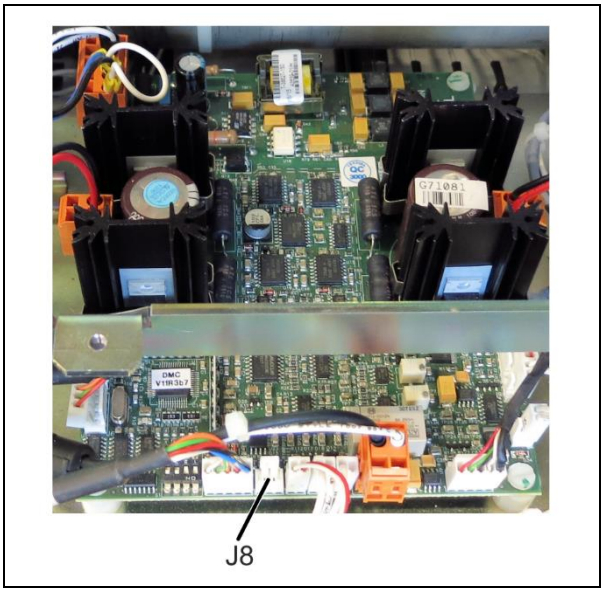

Figure 3

(6) Start **HyperTerminal** on the Service PC with default settings.

(7) Switch on the DX-D 100 / DX-D 100 Wireless.

(8) Check DMC software version and DMC hardware revision shown in the HyperTerminal.

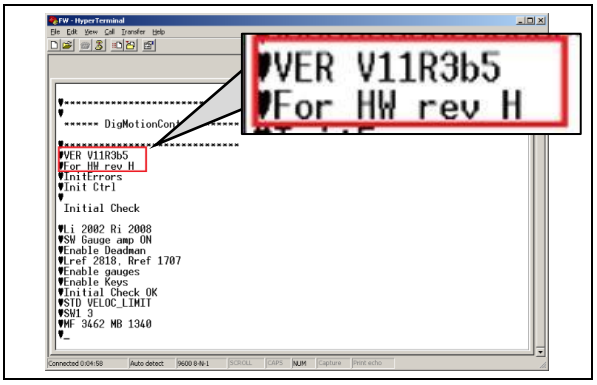

Figure 4: DMC boot log

There are the following upgrade scenarios:

(9) When DMC firmware (on a board revision H) is **below** V11R3b**5**, an upgrade to V11R3b**5** (mandatory) or higher (V11R3b7*) is required.

- In case the cable to load firmware on the board is present:
  - Download firmware from the Agfa HealthCare Library.
  - Upgrade firmware to V11R3b5 or higher.
- In case the cable to load firmware on the board is NOT present:
  - Order the cable, which is part of “Upgrade dig. mot. control V11R3b5“.
  - If required, download firmware from the Agfa HealthCare Library.
  - Upgrade firmware to V11R3b5 or higher.

The firmware upgrade is described in DX-D 100 - X-Ray Mobile - Troubleshooting - Chapter 6.8.6 Updating the Microcontroller, Document ID 41600560.

(10) When DMC hardware is NOT revision H, new DMC board revision H has to be ordered and replaced.

The replacement of the DMC board to rev H is described in the attached Service Information Note
SIN 13-08-13 Replacement of the DMC board to rev H.

*** NOTE:**
DMC firmware V11R3b7 improves the DX-D 100 driving behavior. The installation of version V11R3b7 is not mandatory but recommended in case of issues.
Refer to DX-D 100 - SB076 - Introduction of DMC firmware version 11R3b7, Document ID 52181220.

3.4 Checking parking lock

(1) Check if parking arm (shaft) is clicking perfectly in parking latch to avoid that there is an intermediate contact.

IMPORTANT:
In case the shaft is going in and out the latch during movement the DX-D 100 / DX-D 100 Wireless will change constantly from maximum speed to slow speed.

NOTE:
For parking lock and catch replacement instructions, refer to DX-D 100 / DX-D 100 Wireless - Mobile X-Ray Unit - Service Manual - Troubleshooting, section 2.3.1 Parking Lock Replacement. Refer to Document ID 41600560

3.5 Checking arrestor (PRB0058254)

(1) Visually check the status of the arrestor wear and ensure that the ball makes contact with the floor.

Symptom Arrestor is bended and not working.

Cause In case of a hit against the not flexible fastener (1) the arrestor could be bent.

Solution The fastener is changed by a lock screw (2) and has now flexibility in all the length of the arrestor.

IMPORTANT:

If the discharger of arrestor is still the old design (not replaced during preventive maintenance yet) replace with latest design.

Figure 5: current design

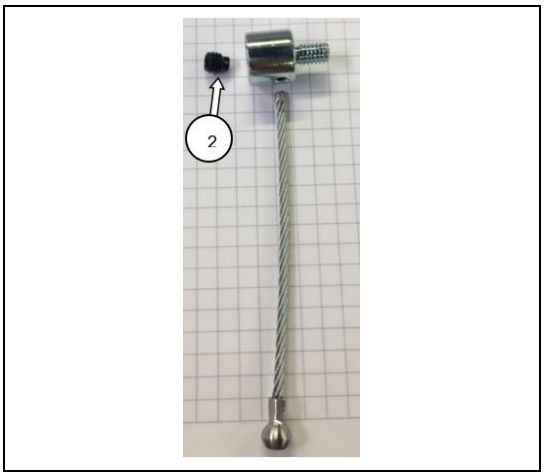

Figure 6: latest design

IMPORTANT:

If the arrestor kit is not the new design (with metal plate + resistors+ iron wire) replace it with latest Arrestor Resistive Kit.

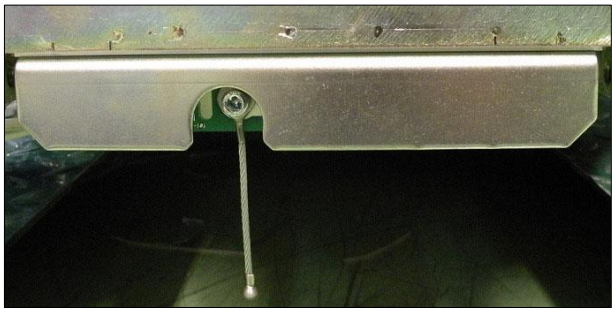

Figure 7: latest Arrestor Resistive Kit

3.6 Checking deadman bar (PRB0060505)

(1) Visually check the status of the deadman bar.

Symptom Plastic deadman bar damaged.

Cause The supports used for protection of the cam of the switches could damage the plastic deadman bar if the bar is pressed with too much force.

Solution The shape of the switches drive handle used in the handlebar assembly have been modified.
The dimension of the area which protects the switch will have been extended until the end of the support. This way the force done to the handlebar is reduced three times.

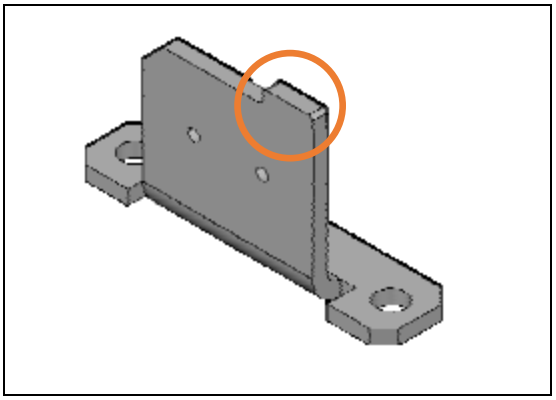

Figure 8: current design

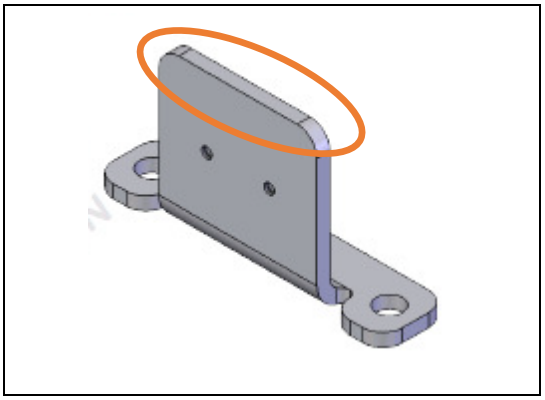

Figure 9: adapted design

Solution In case the deadman bar is damaged, replace the deadman bar and the switches drive handle.

NOTE:
For handle bar replacement instructions, refer to DX-D 100 / DX-D 100 Wireless - Mobile X-Ray Unit - Service Manual - Troubleshooting, section 6.9 handlebar deadman replacement. Refer to Document ID 41600560.

3.7 New material for front and rear wheels

To avoid any ESD discharges and EMP (Electromagnetic pulses) the front wheels have a rolling band made of polyurethane with an ESD treatment, by adding antistatic material.

The rolling band of the optional rear wheels is made of natural rubber with grey dye.

Front wheels:

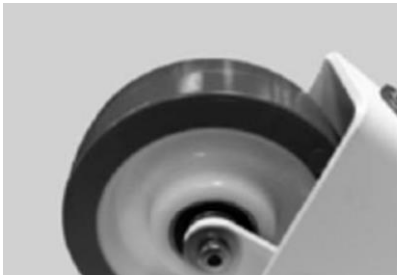

Figure 10: current front wheel material

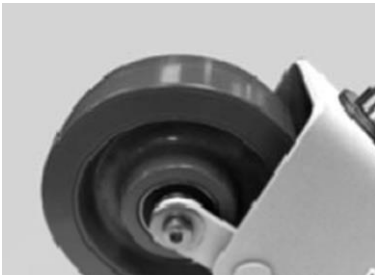

Figure 11: adapted front wheel material

Rear wheels:

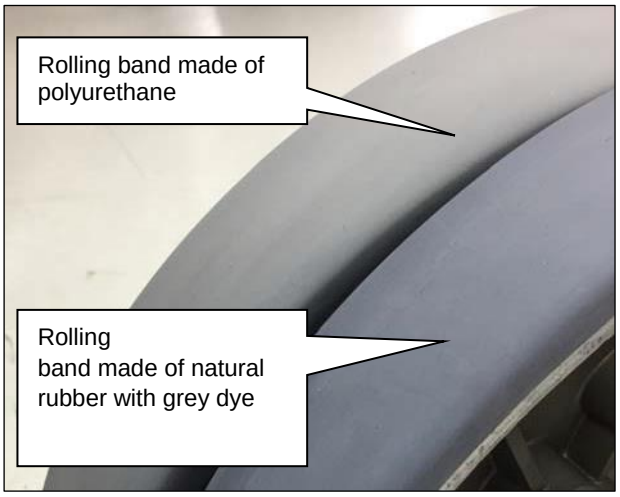

Figure 12

NOTE:

The antistatic wheels are optional for sites which are suffering a lot with electrostatic discharges (e.g. a lot of different floor types).

For replacement instructions, refer to DX-D 100 / DX-D 100 Wireless - Mobile X-Ray Unit - Service Manual - Troubleshooting. Refer to Document ID 41600560

4 Verification

Perform the following tests, depending on the performed modifications:

(1) Voltage of the gauges is within limits.
(2) Tension of the drive chain is OK.
(3) DMC firmware is V11R3b5 or higher, DMC hardware is revision H.
(4) Parking lock is working as it should be.
(5) Arrestor is replaced with new design and touching the ground.
(6) Deadman bar is not damaged.
(7) Depending on the hospital environment there was a need to replace the wheels.
(8) Drive and stop the unit a few times. The unit must start driving and stop as expected.

5 Keywords

Improvements, Preventive check, driving behavior

6 Version history

Version	Change	Date
1.0	Initial version	02-2018

Details as of PDF Creation Date

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