UNION SWITCH & SIGNAL
645 Russell Street
Batesburg, SC 29006

SERVICE MANUAL 7074

Digitair® End of Train Break-Away on the Fly System

Installation ■
Operation ■
Maintenance ■

An Ansaldo Signal Company

November 1998

LIST OF FIGURES & ILLUSTRATIONS

1.0 PURPOSE OF MANUAL

This manual provides information on installation, operation, and maintenance of the DIGITAIR® End-of-Train (EOT) Break-Away On the Fly System, which can be used with US&S EOT Sense and Brake Units (SBU), as well as with EOT units made by other manufacturers.

1.1 DEFINITION OF TERMS

The following terms and abbreviations are used throughout this manual:

EOT - End-of-Train: Refers to an End-of-Train telemetry system comprised of a Cab Unit mounted in the locomotive and an End Unit mounted on the coupler of the last train car.

SBU - Sense and Brake Unit: A two-way End-of-Train End Unit capable of remote Emergency Brake Application such as the SBU Model 6695-CC.

CDU - Communication Display Unit: Any generic two-way End-of-Train Cab Unit.

BAF – Break-Away on the Fly: Refers to the system in which a helper locomotive may disengage from the last train car without the helper locomotive coming to a stop.

BAV – Break-Away Valve: The valves which allow the BAF system to operate.

1.2 PATENTS AND TRADEMARKS

Patents have been granted or are pending on items described in this manual. In the USA, the following patents have been granted:

Brake Pipe Pneumatic Valve Issued as Patent No. 5,683,148 on November 4, 1997.

DIGITAIR® is a registered trademark of Union Switch & Signal Inc.

1.3 R.A.I.L. TEAM AND TECHNICAL SUPPORT

The *Rapid Action Information Link (R.A.I.L.) Team* is comprised of a group of experienced product and application engineers ready to assist and resolve any technical issues concerning DIGITAIR® End-of-Train equipment or any US&S product.

Any questions regarding the contents of this Service Manual can be answered by contacting the R.A.I.L. Team toll free at 1-800-652-7276 or via Internet e-mail at: railteam@switch.com.

1.4 GENERAL OVERVIEW

The Sense & Brake Unit (SBU) monitors brake pipe air pressure via its glad-hand connection to the train's brake pipe. The brake pipe supplies the air to run the brake system for each car and provides the control for applying and releasing the brakes. It runs the entire length of the train. Brake pipe air is supplied to the SBU through a high-pressure flexible hose with a standard glad-hand fitting. In emergency situations, the locomotive operator can initiate an emergency brake command at the Cab Unit to activate the emergency brakes from the rear of the train via the SBU.

The DIGITAIR® End-of-Train Break-Away On the Fly (BAF) System consists of a SBU Break-Away Valve (BAV) assembly (Figure 1-1) which connects the SBU on the last train car to the brake pipe of a helper locomotive, via a Helper BAV (Figure 1-2). This system allows the helper locomotive operator to disengage from the last car of the train without manual intervention outside the cab and ensures a virtually continuous monitoring and control of brake status by the train operator.

When the helper locomotive operator pulls the coupler pin from the cab and applies brakes, the two connected break-away valves separate and the SBU BAV pin closes the valve, ensuring that brake pipe pressure is maintained on the train.

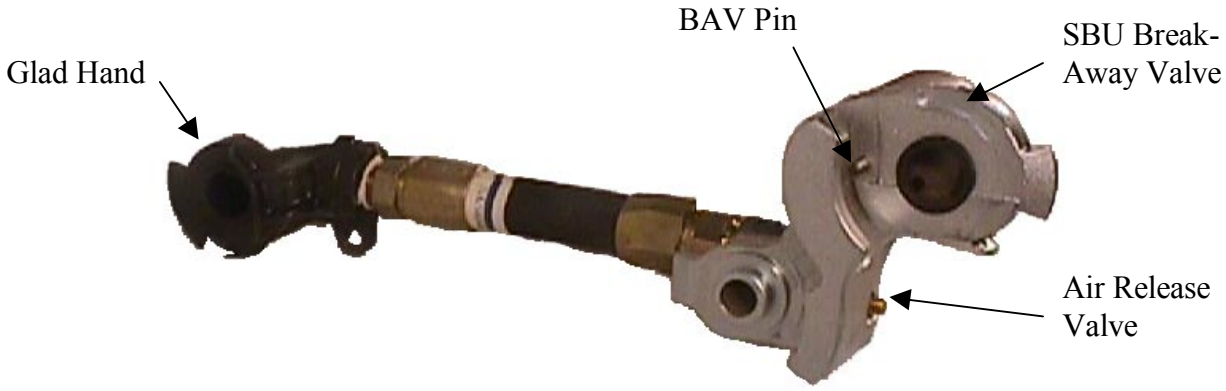


Figure 1-1 – SBU Break-Away Valve Assembly

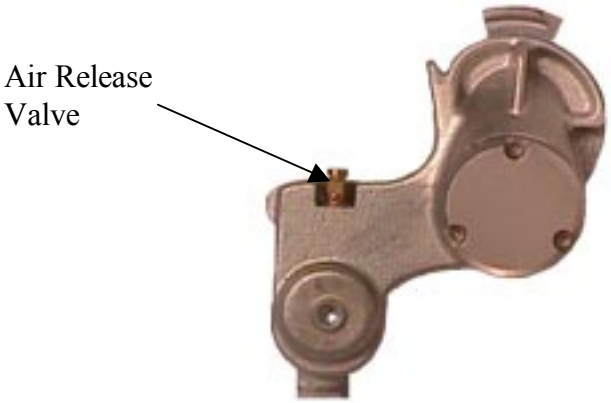


Figure 1-2 – Helper Break-Away Valve Assembly

1.5 ORDERING INFORMATION

The Break-Away on the Fly system consists of two main components, the SBU Break-Away and Helper Break-Away Valve assemblies. Part numbers are in Table 1-1.

Part Number	Description
N25200401	SBU Break-Away Valve Assembly
N25200501	Helper Break-Away Valve Assembly

Table 1-1. Part Numbers

2.0 INTRODUCTION

In general, when installing the SBU Break-Away on the Fly System, follow your railroad's standard operating procedures. Installation consists of connecting the glad hand of the SBU Break-Away Valve Assembly to the glad hand of the SBU on the last car of the train; attaching the last car brake pipe glad-hand to the SBU BAV; attaching the Helper Break-Away Valve Assembly to the helper locomotive brake pipe; and connecting both break-away valves together.

2.1 INSTALLATION INSTRUCTIONS (SEE FIGURE 2-1)

The SBU clamps to the coupler of the last train car. The SBU's brake pipe sensing hose attaches to the glad-hand at the end of the BAV hose and the last car's brake pipe attaches to the non-valve portion of the valve by way of its attached glad-hand. The BAV may be supported by a chain connected from the train car to the BAV Unit.

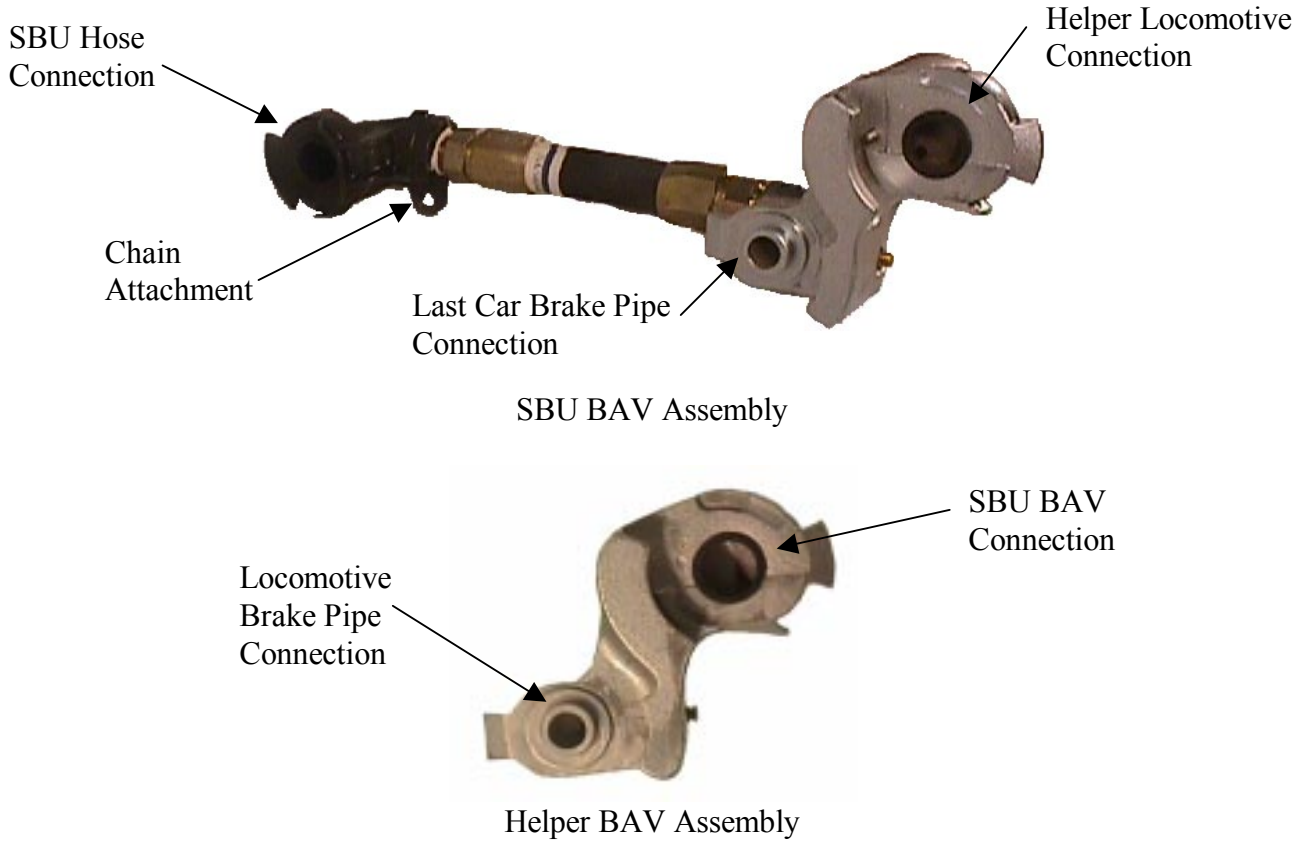


Figure 2-1. Connections

Procedure:

DANGER

If an SBU is already installed on the last car, close the brake pipe angle cock and push in the air release valve to ensure there is no pressure present. Otherwise, personal injury or equipment damage could result.

1. If the SBU is already installed, close the brake pipe angle cock, release brake pipe air pressure with the air release valve, and disconnect the SBU from the last car brake pipe.

2. Connect the SBU's glad-hand/air hose to the SBU Hose Connection on the SBU BAV assembly. Ensure that the glad-hand is fully seated.

3. Connect the glad-hand of the last car brake pipe to the glad-hand on the SBU BAV. Ensure that the glad-hand is fully seated.

4. Connect the helper locomotive brake pipe glad-hand to the locomotive brake pipe connection on the Helper BAV. Ensure that the glad-hand is fully seated

5. Connect the helper locomotive BAV glad-hand to the SBU BAV glad-hand. Ensure that the glad-hand is fully seated

6. Slowly open the angle cocks on both the last car and helper locomotive brake pipes.

NOTE

It is essential that the angle cocks on both the last car and helper locomotive be opened.

2.2 OPERATION

The BAF System permits the helper locomotive operator to disengage from the last train car without manually disconnecting the brake pipes. The operator pulls the coupler disengagement pin, which uncouples the helper locomotive from the last train car. As the locomotive begins to apply brakes and the two move apart, the SBU BAV and Helper BAV disengage under tension and completely separate. A valve in the SBU BAV automatically closes, allowing brake pressure to remain constant. This can be monitored by the train operator via the EOT system. When the helper locomotive comes to a stop, the operator may then close the brake pipe angle cock prior to moving on.

2.3 MAINTENANCE

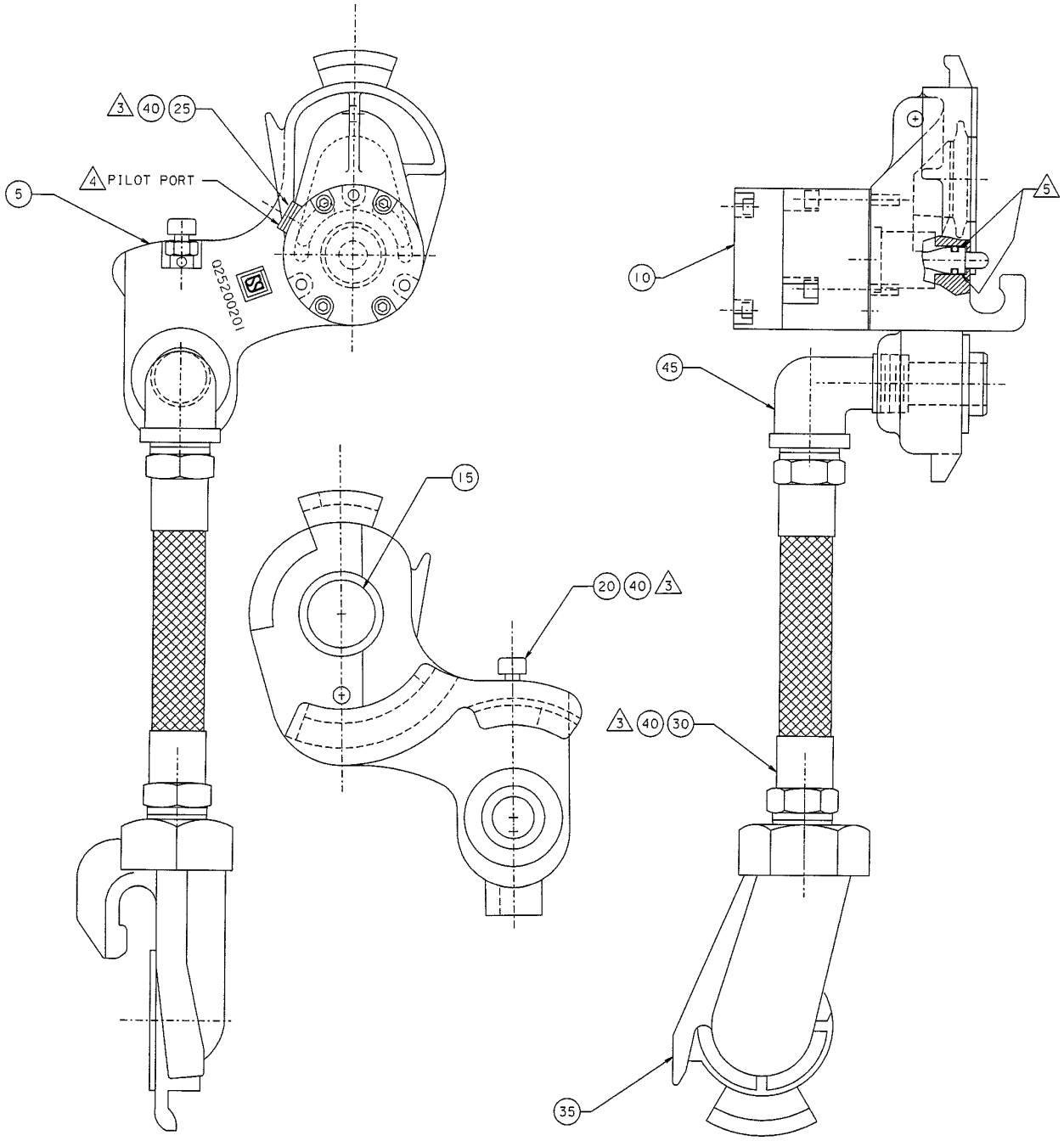
Minimal maintenance is required on the BAF System. Periodically check the connections on the SBU BAV to ensure they remain tight and check the hose for signs of wear. Replace if necessary. Periodically check the glad-hand gaskets on both units. Replace if damaged or brittle.

A.1 SBU Break Away Valve Assembly (PN: N25200401). See Figure A-1.

Item Number	Description	Quantity per Assembly	Part Number
5	Valve Body	1	M25200203
10	Break Away Valve Operator	1	J7924260014
15	Gasket, Glad-Hand	1	J6909510010
20	Valve-Vent 1/8 Male Fit	1	J7924260010
25	Plug, ¼ CI Bl CTSK	1	J032911
30	Air Hose Assy – ¾" Fittings	1	J0327600045
35	Glad-Hand Type F	1	J7924260011
40	Sealent, Pipe, FST	--	J041753
45	Ell – ¾ MI Galv Strt	1	J032483
50	Grease "O" Ring	--	J041593

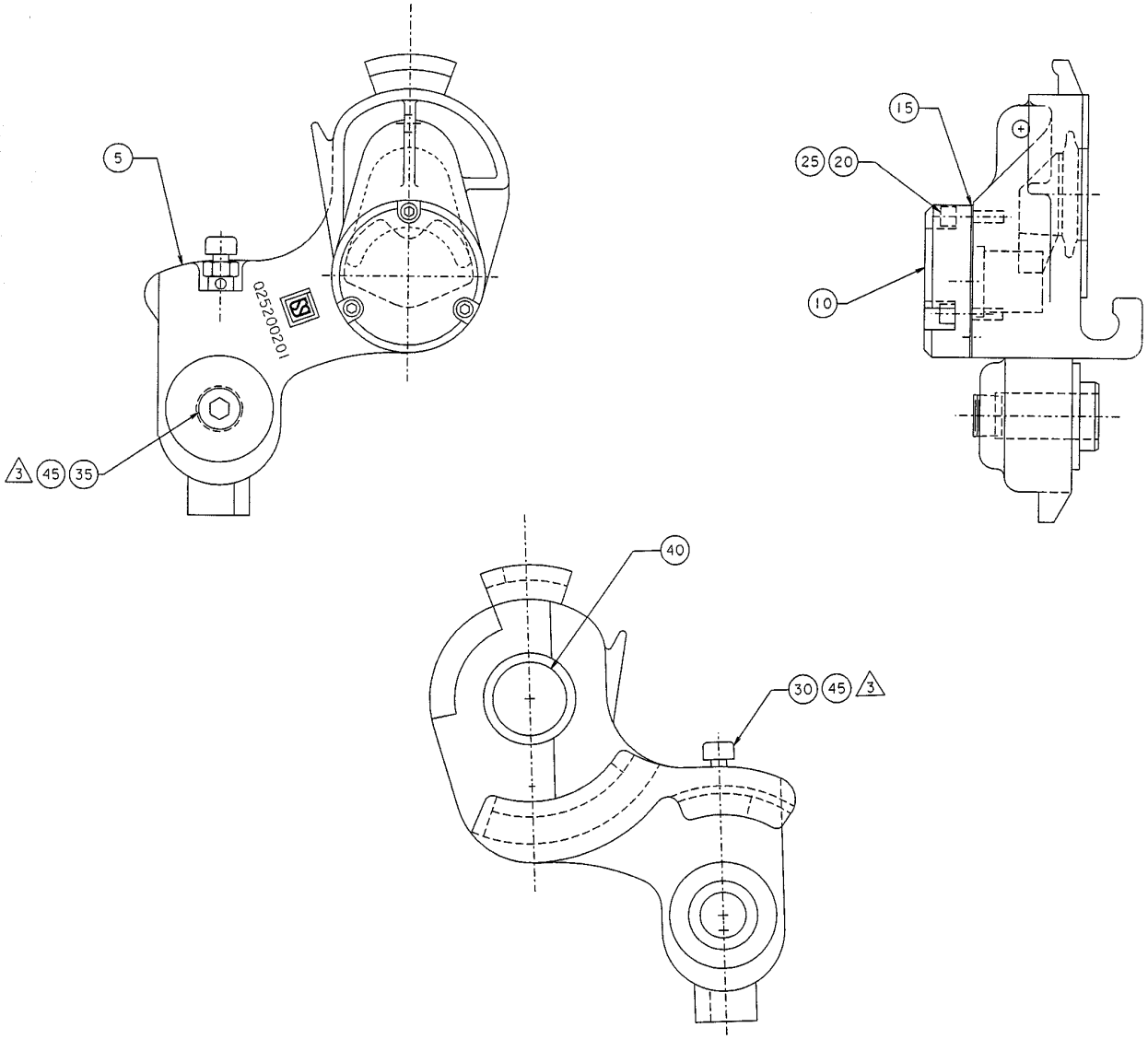
A.2 Helper Break Away Valve Assembly (PN: N25200501). See Figure A-2.

Item Number	Description	Quantity per Assembly	Part Number
5	Valve Body	1	M25200204
10	Valve Cover	1	M25200601
15	Gasket for Break Away Valve	1	J6909510014
20	Screw – 10 – 24 x 5/8 Hex Hd Cap	3	J0465040011
25	Washer – SST Lock No 10	3	J4751210109
30	Valve – Vent 1/8 Male Fit	1	J7924260010
35	Plug – 3/8" Pipe Hex Set	1	J0327600046
40	Gasket, Glad-Hand	1	J6909510010
45	Sealent, Pipe, FST	--	J041753



Notes in ▲
3 – Apply pipe sealant (Item 40) to threads before assembly.
4 – When installing valve (Item 10) and gasket to body (Item 5) line up oblong holes and position the pilot port as shown.
5 – Apply grease (Item 45) to O-Ring mating surface prior to assembly of valve (Item 10)

Figure A-1. SBU Break Away Valve Assembly Parts Drawing



Notes in ▲
3 – Apply pipe sealant (Item 45) to threads before assembly.

Figure A-2. Helper Break Away Valve Assembly Parts Drawing