

**0 General****0.1 Manual amendments**

No.	Page	Description	Date
1	0.5, 0.6, 4.14-4.16 diagrams 7, 11, 12	Manual revision TN 413/2	September 2003
2	0.6, diagrams 1 and 11	Manual revision TN 413/3	May 2004
3	0.4, 0.6, 1.9, diagram 7	Landing gear / over centre lock in extended position TN 413/7	Nov. 2004
4	0.4, 0.5, 0.11, 2.6, 6.2, 6.4, 7.1	Manual revision TN 413/8	January 2005
5	0.4 - 0.6, 0.10, 1.9, 1.10, 4.7 - 4.9 Diagramme 17, 18	landing gear positive locking device TN1000/13	February 2008
6	0.4, 0.6, 0.10, 1.14 diagram 6a	ÄM 1000-02 Fin ballast tank valve and handle	March 2008

**0.2 List of effective pages**

Section	page	issued	replaced/	replaced/	replaced/
0	0.0	March 2002			
	0.1	see manual amendments			
	0.2	"			
	0.3	"			
	0.4	"			
	0.5	"			
	0.6	"			
	0.7	March 2002			
	0.8	"			
	0.9	"			
	0.10	"	Febr. 2008	March 2008	
	0.11	"	January 2005		
	0.12	"			
1	1.1	March 2002			
	1.2	"			
	1.3	"			
	1.4	"			
	1.5	"			
	1.6	"			
	1.7	"			
	1.8	"			
	1.9	"	Nov. 2004	Febr. 2008	
	1.10.	"	Febr. 2008		
	1.11	"			
	1.12	"			
	1.13	"			
	1.14	"	March 2008		
	1.15	"			
	1.16	"			
	1.17	"			
2	2.1	March 2002			
	2.2	"			
	2.3	"			
	2.4	"			
	2.5	"			
	2.6	"	January 2005		
	2.7	"			

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Section	page	issued	replaced/	replaced/	replaced/
3	3.1	March 2002			
	3.2	"			
	3.3	"			
	3.4	"			
4	4.1	March 2002			
	4.2	"			
	4.3	"			
	4.4	"			
	4.5	"			
	4.6	"			
	4.7	"	Febr. 2008		
	4.8	"	Febr. 2008		
	4.9	"	Febr. 2008		
	4.10	"			
	4.11	"			
	4.12	"			
	4.13	"			
	4.14	"	Sept. 2003		
4.15	"	Sept. 2003			
4.16	"	Sept. 2003			
4.17	"				
5	5.1	March 2002			
	5.2	"			
6	6.1	March 2002			
	6.2	"	January 2005		
	6.3	"			
	6.4	January 2005			
7	7.1	March 2002	January 2005		
8	8.1	March 2002			
9	9.1	March 2002			

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diagram	issued	replaced/	replaced/	replaced/
1	Nov. 2001	May 2004		
2	Nov. 2001			
3	Nov. 2001			
4	Nov. 2001			
5	Nov. 2001			
6	Nov. 2001	March 2008	March 2008	Not valid for 10-101, and from 10-128 on
		March 2008		
7	Nov. 2001	Sept. 2003	Nov. 2004	
8	Nov. 2001			
9	Nov. 2001			
10	Nov. 2001			
11	Nov. 2001	Sept. 2003	May 2004	
12	Nov. 2001	Sept. 2003		
17	Febr. 2008			
18	Febr. 2008			
5EP34	25.01.90			
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## 1.6 Undercarriage

### 1.6.1 Main wheel (Version without nose wheel)

1.6.1.1 Undercarriage control circuit  
see diagram 12 and 7 (inside landing gear box)

In the retracted position the undercarriage is locked by an over centre device. In the extended position the lock is by a locking notch at pushrod 10FW38 in the rear cockpit and additionally by over centre locking force generated by a rubber buffer if TN 413/7 has been executed:.

A gas strut reduces the retraction force and keeps the undercarriage in the retracted overcentre locking position.

#### **With TN1000/13 executed, standard from ser. no. 10-133 on:**

An additional landing gear positive locking device (notch and latch at the landing gear struts) secures the landing gear in the extended position.

An additional catch in the front upper area of the landing gear box secures the landing gear in retracted position. See diagrams 17 and 18.

#### 1.6.1.2 Adjustment

a) In extended position (landing gear struts over centre) a max. free play of ca. 0.5 mm (0.02 in.) between the notch at pushrod 10FW38 and the locking plate 10FW35 (see detail X in diagram 12) is allowed when the landing gear handle is pushed forward with a force of approx. 200N (44 lbs.), measurement with main wheel not resting on the ground. Adjustment should be made at the rod end in pushrod 10FW20 at the connection to the actuating lever 10FW15/1.

#### **Additionally with TN 413/7 executed:**

a) Screw out the rubber buffer just so far that it touched the GFRP block (L/G extended).

b) Retract the L/G a little and screw out the rubber buffer for another 4-4.5mm (.16-.18 in.). Fix in position by counter rotating the nut.

#### **With TN1000/13 executed, standard from ser. no. 10-133 on:**

screw out the rubber buffer for only 2 - 2.5mm (.08 - .10 in.).

c) Sit in the front cockpit and extend the L/G. You must feel an over centre locking force.

d)Retract the L/G, you must feel a strong locking force. If necessary increase the locking force by unscrewing the rubber buffer or decrease the locking force by screwing in the buffer.

b) Overcentre lock in retracted position:

Adjustment of the overcentre locking force inside the landing gear box is at the rod ends in the two pushrods 10FW14/3 at their connections to shaft 10FW13/1. The overcentre travel may be adjusted by changing the thickness of the stop-blocks located at the roof of the landing gear box.

**Warning:** If you have adjusted the overcentre locking force don't fail to readjust the locking in extended position see a).

c) **With TN1000/13 executed, standard from ser. no. 10-133 on::**

Adjust the stop bolt in part 10FW74 so that dimension a will be between 14,5 and 15.5 mm (.57 in. and .61 in.) see diagram 18.

Adjust the cable via the adjustment screw in part 10FW74 so that the locking pin disengages when retracting the landing gear. The distance 1mm according to diagram 17 also applies for the disengaged locking pin.

Don't tighten the cable too much!

## 1.6.1.3 Free play

Free play between bellcrank 10FW15/1 and shaft 10FW13/1 is not allowed.

If there is any free play tighten the two securing bolts M 6x35 at the bellcrank and the two securing bolts M6x35 inside the landing gear box at the shaft with a 10 mm open-end wrench. If there is still some free play, the bolts should be removed and the holes drilled out and reamed to diameter 8 H7. M 8 x 40 LN 9037 bolts should then be installed. The bolts for installation inside the landing gear box must be shortened to 36mm.

**1.6.2 Main wheel (Version with nose wheel)**

1.6.2.1 Undercarriage control circuit  
see diagram 8

In the retracted position the undercarriage is locked by an overcentre device. In the extended position the lock is by a locking notch at pushrod 5FW38 in the rear cockpit. A gas strut reduces the retraction force and keeps the undercarriage in the overcentre locking position (retracted and extended).

## 1.6.2.2 Adjustment

- a) **Overcentre lock in retracted position:** Adjustment at the adjustment screw between landing gear operating lever 5FW8 and the bellcrank 5FW36.  
The stop is located at the pushrod 5FW38 and stops against the pedestal 5FW41. Adjust this stop after adjusting the lock in the extended position see b) by gluing slotted shims onto the stop-sleeve of pushrod 5FW38.
- b) **In extended position** (landing gear struts over centre) a max. free play of ca. 0.5 mm (0.02 in.) between the lock at pushrod 5FW38 and the locking plate 5FW35 is allowed. Adjustment at the rod end in pushrod 5FW37 between 5FW38 and 5FW 36.

## 1.6.2.3 Free play

Free play between lever 5FW8 and the upper strut 5FW12 is not allowed.

If there is any free play, the two securing bolts M 6 x 40 should be tightened with a 10 mm open-end wrench. If there is still some free play, the bolts should be removed and the holes drilled out and reamed to diameter 8 H7. M 8 x 40 LN 9037 bolts should then be installed.

**1.8.2 Fin tank**

The fin ballast tank is constructed as integral tank.

## a) Adjustment

The release cable must be adjusted so that the cable just becomes loose when the handle is parallel to the fuselage wall.

## b) Inspection

According to sect. 2.2 a special inspection is to be carried out on the fin ballast tank system at each annual inspection.

The dump time of the full fin tank should be timed and should not exceed 120 seconds.

Check the calibration of the outside air temperature gauge (in the DEI-NT).

**Up to ser.no. 10-100 and ser.no. 10-102 to 10-127:**

Remove the tailwheel and the cover plate in the tailwheel box. Check the control cable and the lever of the valve carefully for wear. Check the control cable at the operating handle too. If the cable or the lever is worn, further use of the fin tank is prohibited. Please contact the manufacturer for a detailed repair instruction.

**Ser.no. 10-101, and from ser. no. 10-128 on:**

Check the control cable at the operating handle and at the dump valve (installed in the lower rudder mounting bracket). If the cable is worn, further use of the fin tank is prohibited.

## 5. Removal of the lower landing gear fork 10Fw11/1

- 1 Remove the main wheel see A.
- 2 Retract the landing gear.  
**Warning:** The landing gear will retract by itself when unlocked by the force of the gas spring!
- 3 Disassemble the gas spring from the left side of the undercarriage box see 4.5.0.
- 4 Extend the landing gear again.
- 5 Remove the 2 bolts M10 LN9037 which connect 10Fw11/1 to 10Fw10/1. (Mark the bolts and don't mix them up when reassembling the parts).
- 6 Remove fork 10Fw11/1.

## 6. Removal of the spring legs (parts 10Fw16 and 10Fw17)

- 1 Remove the main wheel see A.
- 2 Remove the bolts M8×62 LN9037 which connect the spring legs to the fork 10Fw10/1.
- 3 Remove the spring legs.
- 4 If it is necessary to disassemble the spring leg to exchange a component, the reassembly must be done according to drawing 10Fw2 (enclosed to this manual).

## 7. Removal of the struts 10Fw14/1

- 1 Remove the main wheel see A.
- 2 Retract the landing gear.  
**Warning:** The landing gear will retract by itself when unlocked by the force of the gas spring!
- 3 Disassemble the gas spring from the left side of the undercarriage box see 4.5.0.
- 4 Extend the landing gear again.
- 5 **With TN1000/13 executed, standard from ser. no. 10-133 on:** Remove the positive locking device for the extended landing gear position.
- 6 Remove the 2 bolts M8×65 LN9037 which connect the struts to fork 10Fw10/1.
- 7 Remove the 2 bolts M8×40 LN9037 which connect the struts to the rear fork 10Fw12/2 .
- 8 Remove the struts.

## 8. Removal of the front fork 10Fw10/1

- 1 Remove the baggage compartment floor and the rear cover of the baggage compartment.
- 2 Remove the main wheel see A.
- 3 Remove the lower fork 10Fw11/1 see C.
- 4 Remove the spring legs see D.
- 5 Remove the struts see E.
- 6 Remove the nut M12 from the left hand side of the axle 10Fw10/2. Shift the axle towards the fuselage wall. Mark the head of the axis at the outside fuselage wall (e.g. by illuminating this area from the inside) and drill a dia. 24 mm hole through the fuselage wall. Insert a bolt with thread M8 into the head of the axle (from ser. no. 10-7 on) to pull out the axle through the hole.
- 7 Remove the front fork 10Fw10/1.

## 9. Removal of the rear fork 10Fw12/2

- 1 Remove the main wheel see A.
- 2 Retract the landing gear.  
**Warning:** The landing gear will retract by itself when unlocked by the force of the gas spring!
- 3 Disassemble the gas spring from the left side of the undercarriage box see 4.5.0.
- 4 Extend the landing gear again.
- 5 Remove the 2 bolts M8×40 LN9037 which connect the struts to the rear fork 10Fw12/2.  
**With TN1000/13 executed, standard from ser. No. 10-133 on:** bolt M8x40 LN9037 on the right hand side and bolt M8x42 on the left hand side.
- 6 Remove the 2 bolts M6×24 LN9037 which connect the struts to the rear fork 10Fw12/2, don't change the length of the struts and don't mix up right and left strut.
- 7 Remove the nut M12 from the left hand side of the axle 10Fw12/1. Shift the axle towards the fuselage wall. Mark the head of the axis at the outside fuselage wall (e.g. by illuminating this area from the inside) and drill a dia. 24 mm hole (ser. no. 10-1 up to 10-6) resp. dia. 20mm (from ser.no. 10-7 on) through the fuselage wall. Insert a bolt with thread M8 into the head of the axle (from ser. no. 10-7 on) to pull out the axle through the hole.
- 8 Remove the fork 10Fw12/2.

10. Removal of the front upper fork 10Fw13/1

- 1 Remove the main wheel see A.
- 2 Retract the landing gear.  
**Warning:** The landing gear will retract by itself when unlocked by the force of the gas spring!
- 3 Disassemble the gas spring from the left side of the undercarriage box see 4.5.0.
- 4 Extend the landing gear again.
- 5 Remove the 2 bolts M6×26 LN9037 which connect the struts 10Fw14/3 to the front upper fork 10Fw13/1.
- 6 Remove the pushrod 10Fw20 from the actuating lever 10Fw15/1.
- 7 Remove the 2 bolts M6x35 LN9037 which connect the actuating lever 10Fw15/1 to the shaft 10Fw15/3. Shift lever 10Fw15/1 in inboard direction and remove it.
- 8 Remove the 3 bolts M6x35 LN9037 which connect the shaft 10Fw15/3 (left) and 10Fw15/2 (right) to the fork 10Fw13/1.  
**With TN1000/13 executed, standard from ser. no. 10-133 on:** remove the locking catch. (lock for retracted position)
- 9 Shift the shaft 10Fw15/3 towards the left fuselage wall. Mark the shaft at the outside fuselage wall (e.g. by illuminating this area from the inside) and drill a dia. 18 mm hole through the fuselage wall. Insert a bolt with thread M8 into the shaft to pull out the shaft through the hole.
- 10 Insert a bolt with thread M10 into the shaft 10Fw15/2 to pull out the shaft (no hole in the fuselage shell needed).
- 11 Remove the fork 10Fw13/1.

11. Installation

Reverse the above procedures

- 1 Use new nuts LN9348 and a new split pin dia. 1.6x12 DIN94 zn. Install bolts in same directions and washers at same positions.  
During reassembly secure the 2 bolts A with Loctite 243 or safety wire.

**Note:** It is sufficient to tape the holes drilled for removal of the axles. GFRP repair is not necessary.

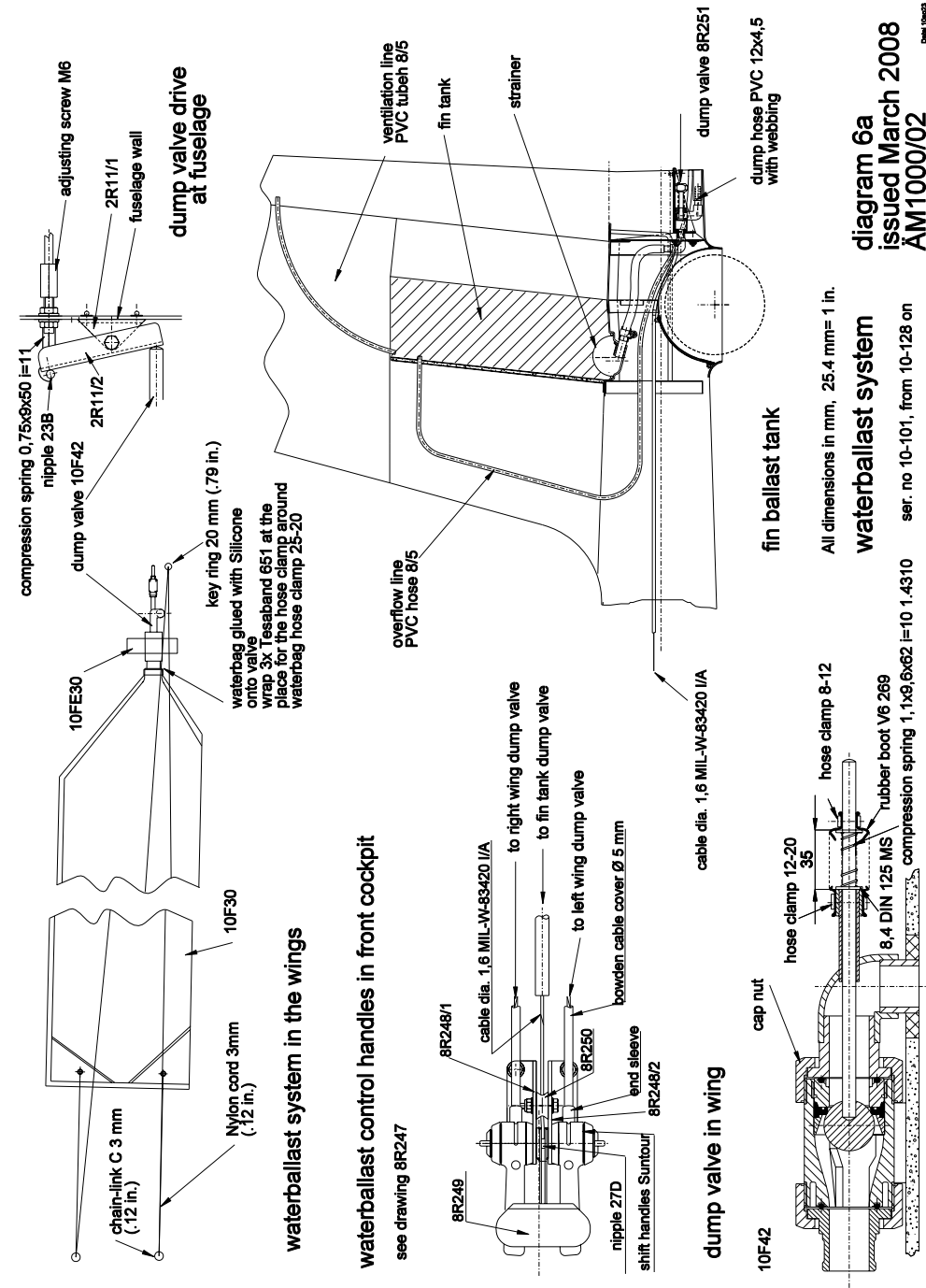
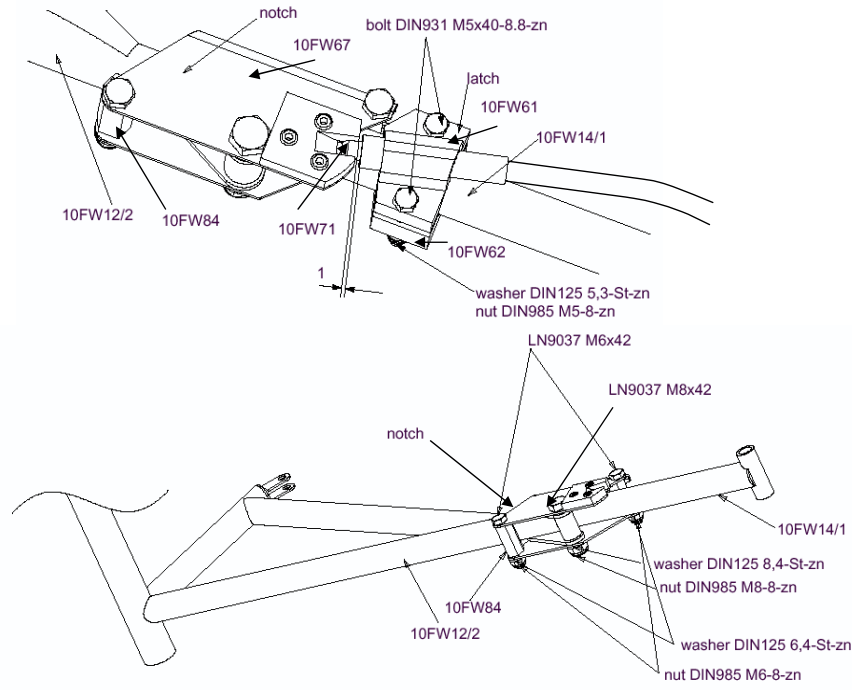


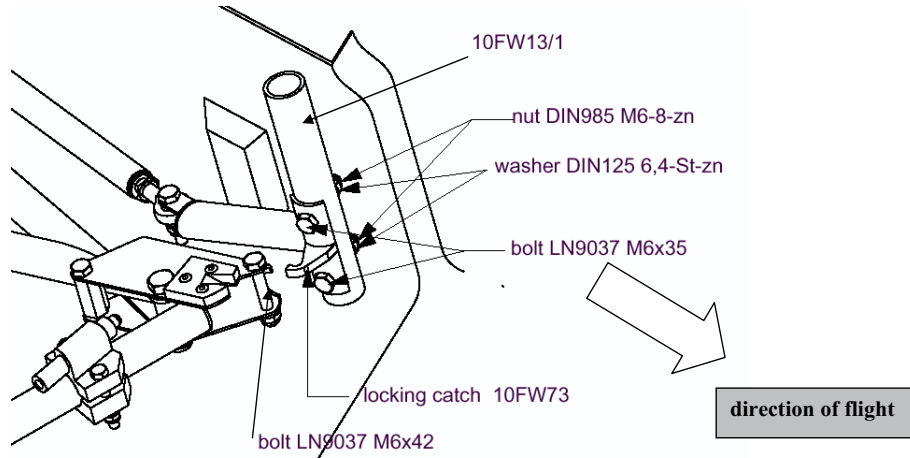
diagram 6a  
issued March 2008  
AM1000/02

Landing gear positive locking device

diagram 17  
issued February 2008  
TN1000/13

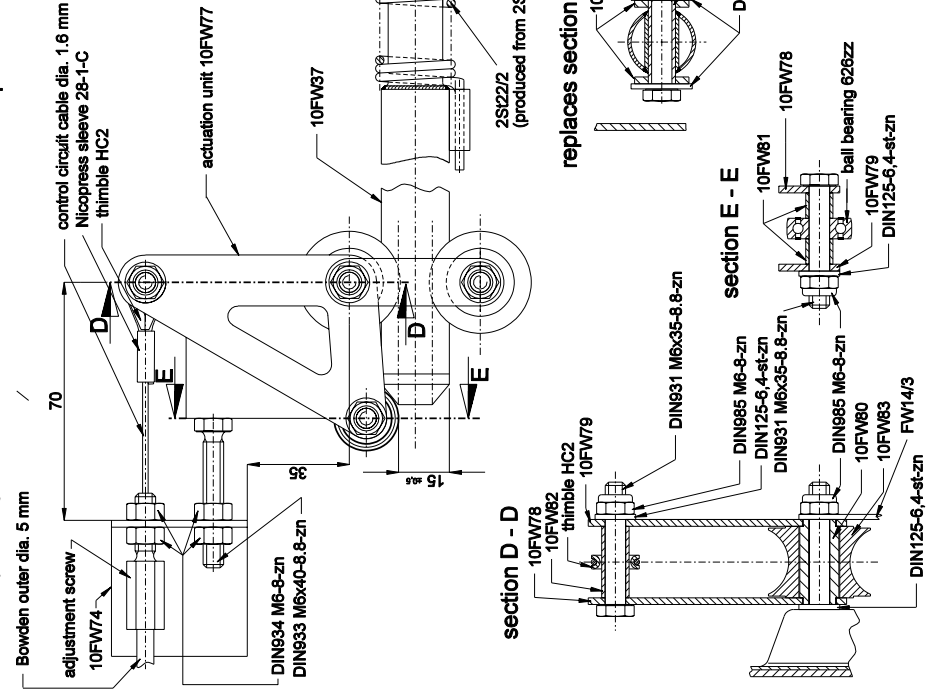


installation of the notch (LG extended) to 10FW12/2



Installation of the locking catch. View LG retracted, locking catch not engaged

additionally to diagram 12



replaces detail W in diagram 12

replaces section C-C in diagram 12

actuation unit  
LG locking device  
differences to MM diagram 12

diagram 18  
issued February 2008  
TN 1000/13