

Maintenance Manual DG-1000M

0 General

0.1 Manual amendments

No.	Page	Description	Date
1	0.0, 0.1, 0.3 ÷ 0.7, 0.9, 0.12 ÷ 0.14, 1.2, 1.5, 1.8 ÷ 1.12, 1.20, 1.24, 1.31, 1.33, 1.34, 2.1 ÷ 2.4, 2.6, 3.1 ÷ 3.7, 4.6 ÷ 4.8, 4.11, 4.12, 4.19 ÷ 4.24, 4.26, 4.27, 4.29, 4.30, 6.1, 6.4, 7.2, 8.1 ÷ 8.4, diagrams 2, 3, 7, 15, 16, 23, add drawing W59, 10E202 issue C (only with coolant pump Pierburg)	Manual revision Alternative for coolant pump TN1000/22	October 2012
2	0.1, 0.3, 0.6, 0.11, 0.13, 0.14, 1.3, 1.4, 1.10, 8.2, 8.3, 8.5	Manual revision TN1000/23	July 2014
3	0.1, 0.3- 0.6, 1.11, 1.28, 3.8, 4.12, 8.2, 8.3, diagram 16	Manual revision TN1000/27	July 2015

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0.2 List of effective pages

Section	page	issued	replaced	replaced	replaced
0	0.0	October 2010			
	0.1	"	See list of amendments		
	0.2	"	See list of amendments		
	0.3	"	See list of amendments		
	0.4	"	See list of amendments		
	0.5	"	See list of amendments		
	0.6	"	See list of amendments		
	0.7	"	See list of amendments		
	0.8	"	October 2012		
	0.9	"	October 2012		
	0.10	"			
	0.11	"	July 2014		
	0.12	"	October 2012		
	0.13	"	October 2012	July 2014	
	0.14	"	October 2012	July 2014	
	1.1	October 2010			
	1.2	"	October 2012		
	1.3	"	July 2014		
	1.4	"	July 2014		
	1.5	"	October 2012		
	1.6	"			
	1.7	"			
	1.8	"	October 2012		
	1.9	"	October 2012		
	1.10	"	October 2012	July 2014	
	1.11	"	October 2012	July 2015	
	1.12	"	October 2012		
	1.13	"			
	1.14	"			
	1.15	"			
	1.16	"			
	1.17	"			
	1.18	"			
	1.19	"			
	1.20	"	October 2012		
	1.21	"			
	1.22	"			
	1.23	"			

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List of effective pages (cont.)

Section	page	issued	replaced	replaced	replaced
	1.24	October 2010	October 2012		
	1.25	"			
	1.26	"			
	1.27	"			
	1.28	"	July 2015		
	1.29	October 2010			
	1.30	"			
	1.31	"	October 2012		
	1.32	"			
	1.33	"	October 2012		
	1.34	"	October 2012		
	1.35	"			
2	2.1	October 2010	October 2012		
	2.2	"	October 2012		
	2.3	"	October 2012		
	2.4	"	October 2012		
	2.5	"			
	2.6	"	October 2012		
3	3.1	October 2010	October 2012		
	3.2	"	October 2012		
	3.3	"	October 2012		
	3.4	"	October 2012		
	3.5	"	October 2012		
	3.6	"	October 2012		
	3.7	"	October 2012		
	3.8	"	July 2015		

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Section	page	issued	replaced	replaced	replaced
4	4.1	October 2010			
	4.2	"			
	4.3	"			
	4.4	"			
	4.5	"			
	4.6	"	October 2012		
	4.7	"	October 2012		
	4.8	"	October 2012		
	4.9	"			
	4.10	"			
	4.11	"	October 2012		
	4.12	"	October 2012	July 2015	
	4.13	"			
	4.14	"			
	4.15	"			
	4.16	"			
	4.17	"			
	4.18	"			
	4.19	"	October 2012		
	4.20	"	October 2012		
	4.21	"	October 2012		
	4.22	"	October 2012		
	4.23	"	October 2012		
	4.24	"	October 2012		
	4.25	"			
	4.26	"	October 2012		
	4.27	"	October 2012		
	4.28	"			
	4.29	"	October 2012		
	4.30	"	October 2012		
	4.31	"			
	4.32	"			
	4.33	"			
	4.34	"			
5	5.1	October 2010			
	5.2	"			
6	6.1	October 010	October 2012		
	6.2	"	October 2012		
	6.3	"			
	6.4	"	October 2012		

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Section	page	issued	replaced	replaced	replaced
7	7.1	October 2010			
	7.2	October 2012			
8	8.1	October 2010	October 2012		
	8.2	"	October 2012	July 2014	July 2015
	8.3	"	October 2012	July 2014	July 2015
	8.4	"	October 2012		
	8.5	July 2014			
9	9.1	October 2010			
	9.2	"			
	9.3	"			
	9.4	"			
	9.5	"			
	9.6	"			
Diagram		issued	replaced	replaced	replaced
1	October 10				
2	October 10	October 2012			
3	June 05	October 2012			
4	Nov. 01				
5	October 10				
6	October 10				
7	October 10	October 2012			
8	October 10				
9	October 10				
10	October 10				
11	October 10				
12	October 10				
13	October 10				
14	October 10				
15	October 10	October 2012			
16	October 10	October 2012	July 2015		
17	October 10				
18	October 10				
19	October 10				
20	October 10				
21	October 10				
22	October 10				
23	October 10	October 2012			
24	October 10				
25	October 10				
26	October 10				
27	October 10				

1.6.2 Hydraulic brake system

- a) Brake fluid approved specification DOT 3, DOT 4, SAEJ 1703.
The brake fluid must be exchanged at least every 4 years.
Exchange see section 4.6.
- b) Adjustment: see section 1.5.2c)
If adjustment does not increase the braking effect as desired, the brake system is leaking or there is air in the brake system. Bleeding of the brake system see section 4.6.
- c) The brake linings must be replaced if they are worn down to a thickness of 2.5 mm (0.098 in.). Removal of the brake calliper see section 4.5B.
Replacement set (2 linings, 6 rivets) Tost Nr. 075860.
- d) The brake disc must be replaced if it is worn down to a thickness of 4.3 mm (0.17 in.).

1.6.3 Tailwheel

Steerable tail wheel linked to the rudder via springs, see diagram 10.

1.6.4 Wheels, tyres and tyre pressures

Main wheel

Tyre: 380 x 150 6 PR, diameter 380 mm (15 in.),
Wheel: Tost 5" wheel with disc brake Penta 130-30
Tyre pressure 3 bar (43 psi)

Tail wheel

Tyre: 200 x 50 6 PR, diameter 200 mm (7,87in.)
Wheel: Plastic hub with ball bearings part. No. S23
Tyre pressure 4 bar (58 psi)

From ser. No. 10-225 on a Socket XLR 3-pole NC3FD-LX-BAG is installed.

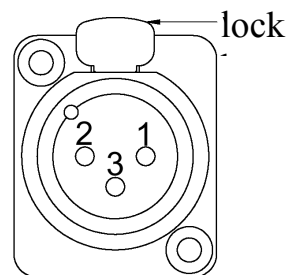
Connection of the socket terminals:

1= +

2= -

3= not used

view from the cockpit



Suitable plugs see parts list section 8.1.2.

1.15.10 Power plant extension/retraction mechanism

See also sect. 1.13

The automatic extension and retraction is controlled by the control unit see sect. 1.15.3.

The extension-retraction motor will be switched off at the end limits by position switches see sect. 1.13.5.

Caution: If the control unit detects that the proximity switch is defective a safety interlock prevents the engine from being retracted automatically with the propeller not in the correct position. The retraction of the powerplant must be done with the manual switch. The DEI-NT will display the failure message “PropSensor”.

The proximity switch must be exchanged prior to the next engine start.

1.15.11 Manual extension-retraction switch

Manual extension and retraction is via one switch which is located on the instrument panel. When this switch is operated, the automatic extension/retraction system will be switched off. The automatic system will be switched on again when you operate the ignition switch. The manual switch activates the extension/retraction relays in the control unit directly, by-passing the safety functions.

Caution: With the manual switch a running powerplant may be retracted.

1.15.12 Starter Press Button

A starter press button is located in the centre of each throttle handle and activates, via the interlocks, the starter relay in the control unit, see sect. 1.15.3.

Ground test run:

Warning: Never run the engine without the wings assembled.

- 28) Check the ignition circuits at 4000 RPM, drop should not be more than 300 RPM.
- 29) Check emergency system: Switch over from normal system at 4000 RPM. After a short RPM drop the engine should run with approx. the same RPM.
- 30) Check max. engine RPM - minimum 5900 RPM at CHT of 65°C.
- 31) Check EGT's: EGT should be 600°C \pm 20°C at full power and engine warmed up.
- 32) Check the fuel pressure with normal and emergency system at 4000 RPM. Pressure should be 3 up to 3.2 bar. With lower pressure the filters and / or the fuel pump of the respective system must be exchanged. Remove the manometer and reinstall the screw plug to the service port. Use a new copper sealing ring 10x14x0,8 DIN 7603 A.

3.6.2 After every 100 engine hours

The drive belts and the spark plugs have to be exchanged.

3.6.3 After every 400 engine hours

The power plant must undergo a major overhaul.

Apart from the items listed in section 3.6.1., the following items also need to be done:

1. Remove the power plant and remove the engine from the powerplant. Ship the engine to the manufacturer or an aircraft engine maintenance workshop approved by the manufacturer and by the authorities.
2. Replace all the nuts and bolts on the engine.
3. Replace the drive belt.
4. Replace the bearings of the upper drive belt pulley.

3.6.4 After 6 years

1. Replace all fuel filters
2. Replace the rubber fuel lines and the gasket of the drainer valve.

Caution: The new fuel lines must be flushed thoroughly with fuel after assembly.

3. Replace all coolant hoses and the coolant.

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- Fill the first syringe again, open the bleeder valve and fill in further brake-fluid. Look at the reservoir while filling to see if air bubbles are coming out of the line. Fill up to 15 mm (0.6 in.) below the upper edge of the reservoir.
- Close the bleeder valve, reinstall the membrane and the cap to the reservoir and remove the bleeder assy.
- Check brake pressure according to step 4.
- Reinstall the eye bolt.

4. Check brake pressure

- extend the airbrakes, there must be a strong pressure when the wheel brake engages.
- check several times, the wheel brake must engage at the same point every time
- if this is not the case, you have to bleed the system again

5. Check the hydraulic brake system for leaks

- extend the airbrakes with high force and hold it in this position for 2 minutes.
- Then check the whole hydraulic system visually for leaks. If necessary tighten the screwed joints or replace the sealings and bleed the system again.

Note: The adjustment of the length of the cable between the master cylinder and the airbrake control shaft restricts the max. airbrake extension height. The adjustment of this cable should be done with the glider rigged.

6. Bleeding the hydraulic brake system

- Remove the brake fluid from the reservoir using the syringe.
- Then execute again items 3 and 4 of this instruction.

7. Exchanging brake fluid (every 4 years)

- Perform preparations (see step 2.) of this instruction. It is not necessary to remove the main wheel.
- Fill the system with new brake fluid (see step 3.). To accomplish this remove all brake fluid from the reservoir first with the second syringe. Used brake fluid is darker than new brake fluid and can easily be identified. Watch the reservoir while filling to see when the new fluid streams into the reservoir. Repeat the filling process until only new fluid is in the system and no air bubbles can be detected.
- Perform steps 4. and 5. of this instruction.

8.1.2.2 Parts for cooling system

- 60001201 Electric water pump Webasto U4810 modified (no longer available)
- 60001210 Coolant pump Pierburg modified (replacement for Webasto).
- 41072800 Elastic adapter-ring 10M280

Note: A voltage converter 10E211 (see section 8.1.2.4) must be installed to run the coolant pump Pierburg with sufficient power.

- 60504049 Radiator KTM VW 0425 or later type VW2192
- 39001019 Service kit cooling system hoses

Rubber mounts for radiator

- 60000275 2 pieces Rundlager Type B (upper mount)
- 60000262 1 piece Rundlager Type A (lower mount)
- 60000377 Copper sealing ring 10x14x0,8 DIN 7603 A for service port

8.1.2.3 Parts for fuel system

- 60507550 Drainer CAV 110 (1/8" NPT)

Warning: Replace the sealing ring of the drainer against partno. 60504402 prior to installation

- 60504402 Sealing ring for drainer CAV 110 (for automotive fuel)
- 60510516 Fuel pressure switch DRS 5 ES 0,5 – 5 bar seal FKM or
- 60510519 Fuel pressure switch Beck 901.51
- 60507577 Fuel pressure regulator Pierburg 7.21476.50.0 (no more available)

Note: When replacing by 60507578 follow the working instructions No. 1 for TN1000/27.

- 60507578 fuel pressure regulator Solo 2300884 (Bosch 0280160557 with bracket from Solo)
- 60507575 Fuel pump Pierburg with rubber sleeve 7.22156.60.0
- 60507562 Refuelling pump Facet 60106
- 60507576 Fuel filter Pierburg Nr. 4.00030.80.0 (in front of fuel pump)
- 60507568 Fuel filter MANN WK 613 (behind fuel pump)
- 60507571 MANN-fuel- filter 500009180 WK 31/2(10) for refuelling pump
- 60510833 Injection valve Bosch 0 280 155 868
- 60504407 O-Ring for Injection valve Bosch
- 60507802 Front fuel gauge: VDO 224-011-020-279X
- 60507800 Rear fuel gauge: VDO224 082 005 088
- 60000527 Fuel cock KH 1072 T
- 60507607 Coupling for fuel filler hose KL-006-0-SL007
- 45001605 Full tank sensor
- 48000009 Fuel hose 7,5x13,5 mm DIN 73379-2A
- 48000092 Fuel hose Inner dia. 3,5 mm fabric braided 2122.0200 (for emergency system)

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- 60507526 Fuel hose 15 x 23 mm fabric braided (at fuel pump)
- 30092051 Metal braiding inner dia. 8 mm
- 60000377 Copper sealing ring 10x14x0,8 DIN 7603 A for service port

8.1.2.4 Parts for the electrical system

- 60510899 Main battery: Odyssey PC625 12V/17Ah
- 41076003 DEI-NT- DG-1000M
- 41076004 DEI-NT-DG-1000M second unit (rear cockpit)
- 41076005 Control unit-NT-DG-1000M
- 41076006 Engine control unit ECU Trijekt-Plus T101 Solo No. 23 00 886
- 41076007 Controller for emergency system Solo No. 23 00 896

- 41075210 Engine speed sensor (normal system+emergency system) Bosch 0261210147 assembled with wiring and plugs
- 60510836 Throttle valve sensor: Bosch 0 280 122 201
- 60510837 Probe for coolant temperature Bosch 0 281 002 209
- 60510669 Intake air sensor Epcos B57881S212F
- 41075204 Proximity switch ready assembled with wiring and plug
- 41075211 Voltage converter 10E211 for coolant pump Pierburg

- 60510834 Ignition coil Solo No. 23 00 883

- 60510832 Regulator Ducati 34407011
- 60504044 Voltage reducing module for generator/regulator
- 60510202 Condensor for generator/regulator 100.000µF/40V

- 60510464 Limit-switch engine retracted and engine extended 164-574, alternatively SI2010-B2T20YR30,5m
- 60510506 Manual extension-retraction switch MTG 106 G
- 60510465 Black cap for switch MTG206S
- 60510483 Switch for emergency engine control: APEM 5636 MA
- 60510466 Red cap for APEM 5636 MA

- 60510854 Key switch 3 Pos, 2 Pol KL09-1908KA (Master switch)
- 60510362 Switch STA 106 E (selector intern-extern)
- 60510372 Press-button DJET 07.17502.21 for starter
- 60510375 Press-button 12G2904 for refuelling pump

- 60510385 Circuit breaker ETA 2A
- 60510386 Circuit breaker ETA 3A
- 60510437 Fuse 01191017003 80 A for battery

- 60510796 Socket BSB 12 (in main bulkhead)
- 60510797 Plug BSK12 for socket BSB 12

- From ser. No. 10-225 on:**
- 60510880 Socket XLR 3-pole NC3FD-LX-BAG
- 60510881 Plug XLR 3-pole NC3MX-BAG (for socket XLR)

fuel hoses
 8x2x12 PUR, transparent
 PU hydrolyse and microbe resistant

7,5x13,5 DIN 73379-2A,
 with metal shield

3,5x7,5 fabric braided
 with metal shield

7,5x13,5 DIN 73379-2A

15x23 fabric braided

Fittings and clamps

m red heat shrink tubing, 30mm long
 n blue heat shrink tubing, 30mm long

o clamp 95
 p clamp 145

r elbow fitting WSAG 06 1/8" brass
 s elbow fitting WSAG 08 1/8" brass
 t nipple SAG 08/R 1/8"

u hose clamp S70/7 (14/9)

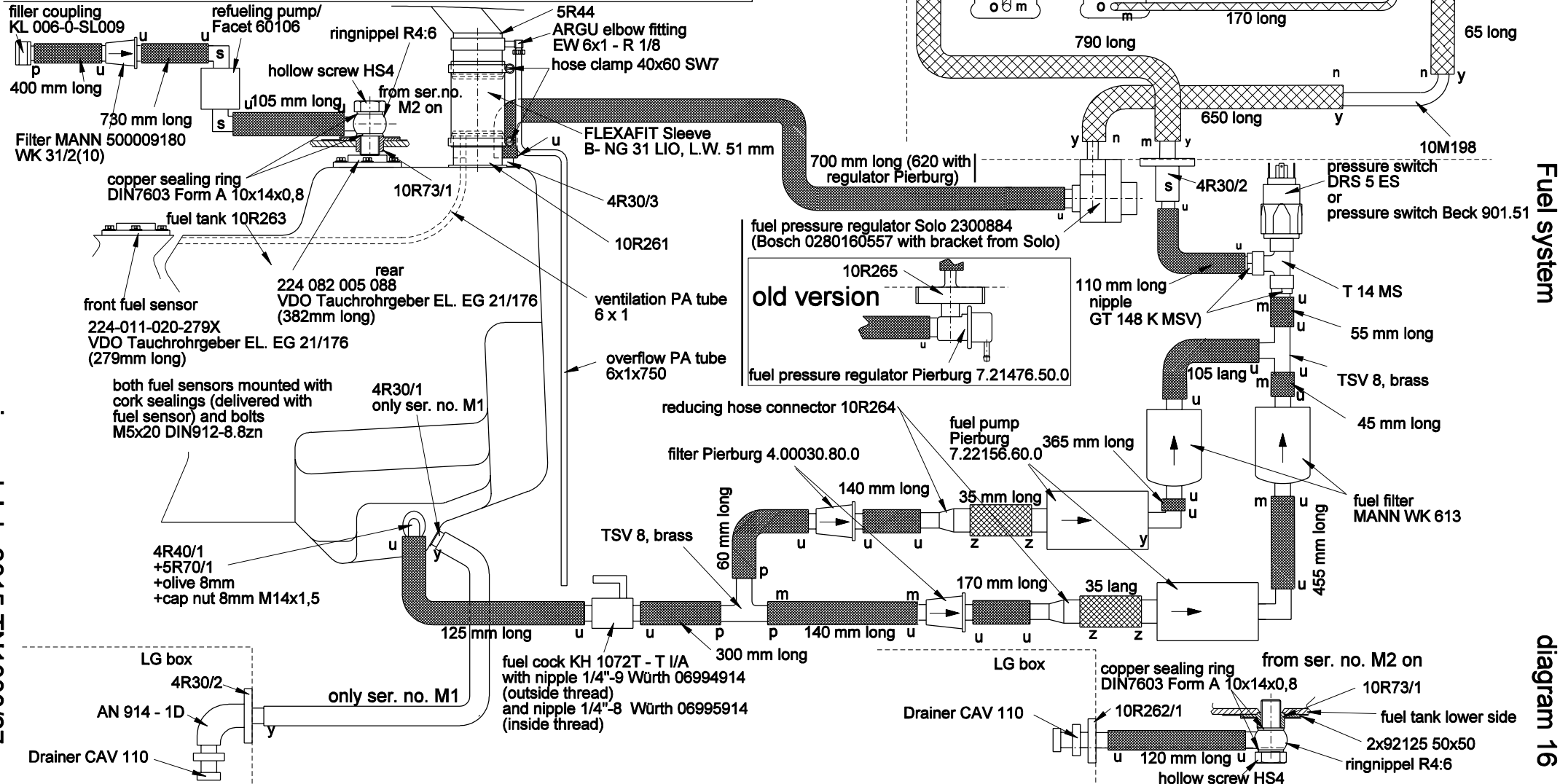
v hose clamp S70/4 (6/7)

w hose clamp S70/1 (9/9)

x hose clamp S70/2 (11/9)

y hose clamp 539, 8-16mm, width 9mm W2

z hose clamp 539, 16-25mm, width 9mm W2



Fuel system

diagram 16

issued July 2015 TN1000/27