

**Draft supplements to UN/ECE Regulation 67-01 series
with a view to update the requirements on the LPG filling unit**

Transmitted by the Expert from the European LPG Association (AEGPL)

Note: At the 41st GRPE session (January 2001), the AEGPL, as the representative Body of the European LPG Industry, presented the Informal Document N°7 with a view to introduce in the UN/ECE Regulation 67-01 series all the necessary provisions for the type-approval of the new European LPG filling units for light and heavy duty vehicles.

As expressed in this document, the major aim of the European LPG Industry by intending this action is to improve the customer friendliness of the LPG refuelling operations regarding both safety and environmental aspects through guaranteeing everywhere in Europe an harmonised design of the LPG filling unit and an appropriate installation on the future LPG vehicles.

Further to the formal publication by the GRPE Secretariat of the Informal Document N°7 under the reference TRANS/WP29/GRPE/2001/8, no comment from the GRPE experts have been received in AEGPL yet.

Nevertheless, in the last weeks, AEGPL has undertaken consultations with some GRPE experts (Netherlands, Italy, Poland, France) and the car manufacturers to draft a document which can receive the agreement of the GRPE experts at the 42nd GRPE session.

Main changes of this new AEGPL document, by comparison to the document TRANS/WP29/2001/8, can be summarised as follows :

- **Suppression of the vehicle connector definition** : the text has been clarified so that no additional definition of automotive LPG device shall be introduced in the R67-01 series text.
- **introduction of a 2 steps approach : all the transitional provisions for the implementation of the Euro filling units have been deleted** as the following approach has been suggested :
 1. introduction in the R67-01 series of all the necessary rules to allow the type-approval of vehicles fitted with the new Euro-filling unit; this is the subject of this proposal which is expected to be implemented before summer 2002;
 2. introduction at the GRPE meeting of January 2002, of a new informal document which will require to fit on new vehicles only a filling unit of an "Euro" type; This proposal, if agreed at the GRPE meeting of May 2002 is expected to be implemented before summer 2003.

This approach shall simplify the administrative procedures linked to the introduction of the new "Euro" filling unit on the European market as well as its implementation by the car manufacturers.

- **Deletion of the provisions linked to the design of an "evolutive filling unit"** – as described in the paragraph 6.15.14 of document TRANS/WP29/GRPE/2001/8, to avoid any misunderstanding from the Type-approval Authorities.

These provisions are more linked to the manufacturer know-how than to the regulatory rules. Thus, they will only be mentioned in the CEN standard dealing with this subject (pr EN 12806 / AUTOMOTIVE LPG components other than tanks).

The European LPG Industry experts insist on the need to fit vehicles only with a filling unit made of one part, when presented to the type-approval authority. This is already the case today, according to the current R67-01 rules. The addition of the requirement in the paragraph 6.15.10.1 will clarify it.

- **Addition of 3 new tests to check the behaviour of the filling unit in operating conditions** : tests on resistance to dry heat and ozone ageing have been added to ensure consistency with the provisions required on other automotive LPG devices submitted to the same operating conditions.

Addition of an impact test to ensure the safe operations of the filling unit even after wrong disconnections during refuelling operations or further to a vehicle crash.

AEGPL remains at the disposal of the GRPE experts for any additional information which might be necessary to analyse this proposal which shall improve the safety as well as the environmental performances of future LPG vehicles.

H. CHAPOTOT
Director General

**Note : The enclosed document show all the provisions linked to the filling unit as currently described in the R67-01series text.
AEGPL draft amendments are underlined for what concern the additions and barrelled for what concern the suppression.**

**Draft supplements to UN/ECE Regulation 67-01 series
with a view to update the requirements on the LPG filling unit**

1. Amendments needed to be introduced in the Part 1 :

- **The requirements on the filling unit shall be changed as follows to introduce the requirements on the new future European vehicle connectors:**

2.16 "Filling unit" means a device to allow filling of the container; the filling unit can be realised by integration in the 80 per cent stop valve of the container or by a remote filling unit at the outside of the vehicle;

6.15.10 Provisions regarding the filling unit

6.15.10.1 The filling unit shall be equipped with at least one soft seated non-return valve, and shall be protected against dismantling in normal operating conditions.

6.15.10.2 The filling unit shall be protected against contamination.

6.15.10.3 The design and dimensions of the connecting area of the filling unit must comply with those in the figures in Annex 9.

The filling unit shown in the figure ~~3~~ 5 is only applicable for motor vehicles of categories M2, M3, N2, N3 and M1 having a maximum total mass > 3,500 kg. */

6.15.10.4 The filling unit shown in the figure 4 may also apply for motor vehicles of categories M2, M3, N2,N3 and M1 having a total mass > 3500 kg.

6.15.10.5 The outside filling unit is connected to the container by a hose or a pipe.

6.15.10.6 Specific provisions regarding the light vehicle Euro filling unit (Annex 9 - Figure 3):

- The dead volume between the front sealing surface and the front of the non-return valve shall not exceed 0,1 cm³;
- The flow through the connector at a pressure difference of 300 kPa shall be at least 60 L/min, if tested with water.

*/ As defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3), annex 7 (document TRANS/WP29/78/Rev.1/Amend.2).

6.15.10.7 Specific provisions regarding the heavy-duty vehicle Euro filling unit (Annex 9 - Figure 5) :

- The dead volume between the front sealing surface and the front of the non-return valve shall not exceed 0,5 cm³;
- The flow through the filling unit, with the non-return valve mechanically opened, at a pressure difference of 500 kPa shall be at least 200 L/min, when tested with water.

2. No changes are needed to be introduced in the Part 2 :

- 17.10. Filling unit
- 17.10.1 The filling unit shall be secured against rotation and shall be protected against dirt and water.
- 17.10.2 When the LPG container is installed in the passenger compartment or an enclosed (luggage) compartment, the filling unit shall be located at the outside of the vehicle.

3. Additions to be shown in the current Annex 9 of the R67- 01 series :

- **The applicable test procedures to be complied with by the filling unit shall be changed as follows :**

"6. Applicable test procedures:

Over pressure test	Annex 15, para. 4
External leakage	Annex 15, para. 5
High temperature	Annex 15, para. 6
Low temperature	Annex 15, para. 7
Seat leakage test	Annex 15, para. 8
Endurance	Annex 15, para. 9 (with 6,000 operation cycles)
LPG compatibility	Annex 15, para. 11 <u>**/</u>
Corrosion resistance	Annex 15, para. 12 <u>*/</u>
<u>Resistance to dry heat</u>	<u>Annex 15, para. 13</u>
<u>Ozone ageing</u>	<u>Annex 15, para 14</u>
Creep	Annex 15, para. 15 <u>**/</u>
Temperature cycle	Annex 15, para. 16 <u>**/</u>
<u>Impact test</u>	<u>paragraph 7 of this Annex"</u>

*/ only applicable for metallic parts

**/ only for non-metallic parts

Remarks :

- The overpressure test has to be performed on each non-return valve.
- The endurance test shall be carried out with a nozzle specifically intended for the filling unit under test. 6 000 cycles shall be applied according to the following procedure :
 - connect the nozzle to the connector and open the filling unit system;
 - leave in open situation for at least 3 seconds;
 - close the filling unit and disconnect the nozzle.

➤ **Description of the impact test for the filling unit shall be added to the test methods:**

7. Impact test requirements

7.1 General requirements

The filling unit shall be subjected to an impact test of 40 j.

7.2 Test procedure

A hardened steel mass of 4 kg shall be dropped from a height of 1m so as to deliver the impact velocity 4.4 m/s. This shall be achieved by mounting the weight in a pendulum.

The filling unit shall be installed horizontally on a solid object.

The impact of the weight shall be on the centre of the protruding part of the filling unit.

7.2 Test interpretation

The filling unit shall comply with the external leak test and seat leak test at ambient temperature.

7.3 Re-testing

If the filling unit fails the test, 2 samples of the same component shall be submitted to the impact test. If both samples pass the test, the first test shall be ignored.

In the event where one or both fail the re-test, the component shall not be approved.

Figure 1: connecting area of the Bayonet filling unit

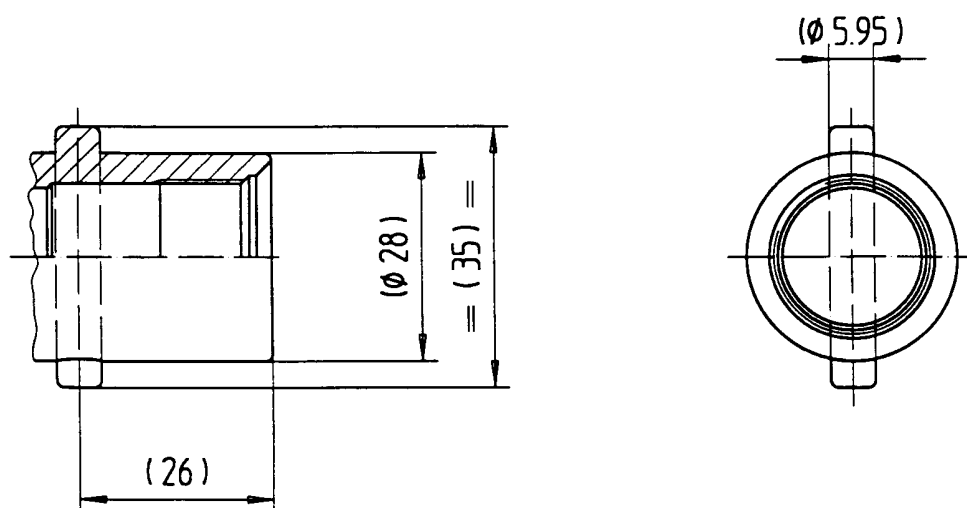


Figure 2: connecting area of the Dish filling unit

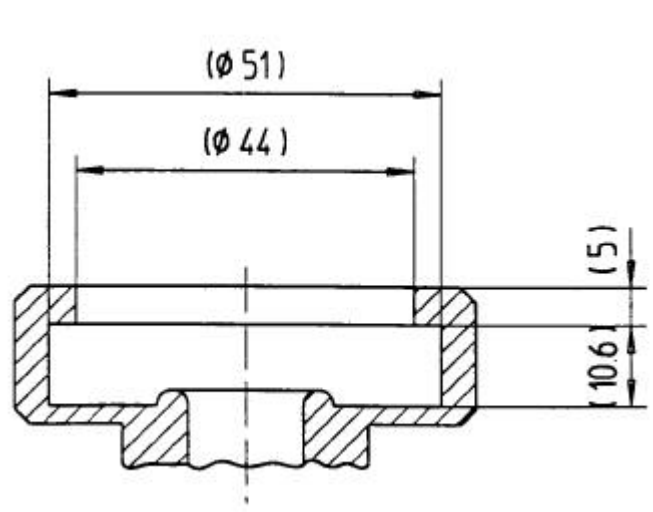


Figure 3: connecting area of the light vehicle Euro filling unit

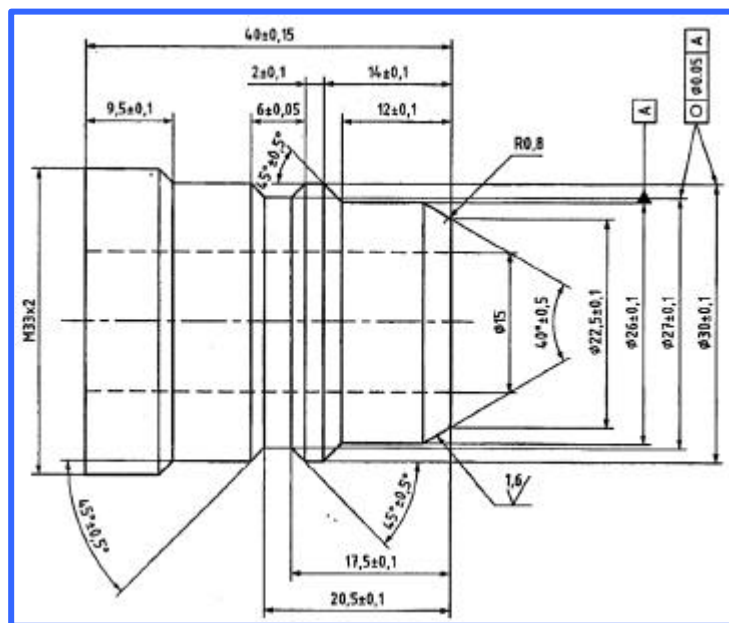
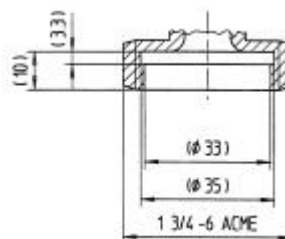
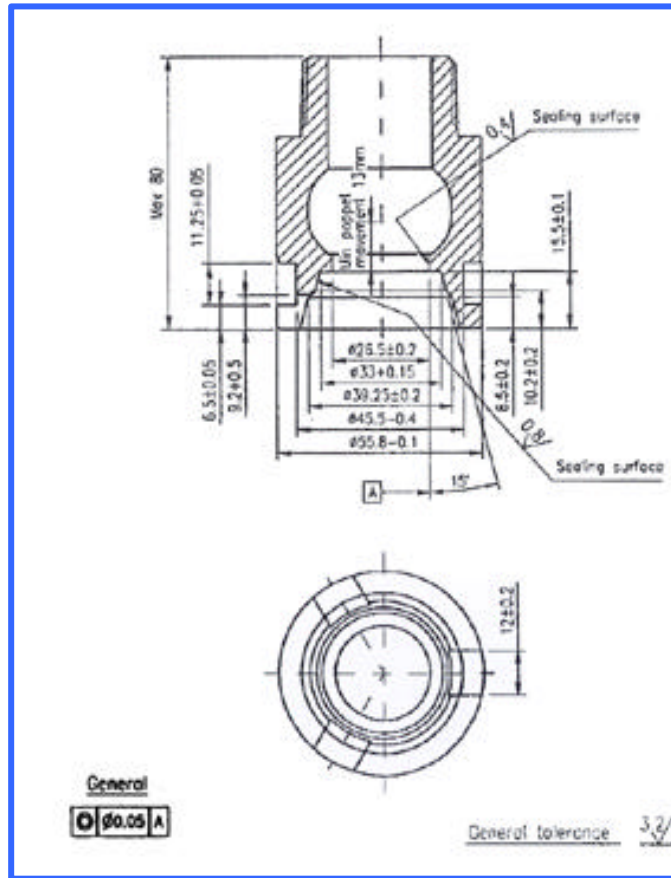


Figure 4: connecting area of the ACME filling unit



~~Note: This filling unit applies only for motor vehicles of categories M2, M3, N2, N3 and M1, having a total mass > 3500 kg. 1/~~

Figure 5: connecting area of the heavy duty vehicle Euro filling unit



1/ ——— As defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3), annex 7 (document TRANS/WD.29/78/Rev.1)