



LE GOUVERNEMENT
DU GRAND-DUCHÉ DE LUXEMBOURG

Ministère des Transports

L-2938 Luxembourg

SOCIÉTÉ NATIONALE DE
CERTIFICATION ET D'HOMOLOGATION
s.à r.l.

Registre de Commerce: B 27180

L-5201 Sandweiler



Référence: E13*67R00*67R01*0286*00

Annexes: - Rapport technique
- Fiche de renseignements du constructeur

Sandweiler, le 25 janvier 2007

Communication concernant ¹⁾:
Communication concerning ¹⁾:



- la délivrance d'une homologation
approval granted
- l'extension d'homologation
approval extended
- le refus d'homologation
approval refused
- le retrait d'homologation
approval withdrawn
- l'arrêt définitif de la production
production definitely discontinued

d'un type d'équipement GPL en application du Règlement N° 67
of a type of LPG equipment pursuant to regulation N° 67

Numéro d'homologation:
Approval number:

E13*67R00*67R01*0286*00

Marque d'homologation:
Approval mark:

 67R-010286 CLASS 1 / 2 / 3

1. Equipement GPL ¹⁾:
LPG equipment considered ¹⁾:

Réservoir:
Container:

not applicable

Accessoires fixés au réservoir:
Accessories fitted to the container:

- 80 % stop valve
- level indicator
- pressure relief valve (discharge valve)
- pressure relief device
- remotely controlled service valve with excess flow valve

Bloc multivannes, y compris les accessoires suivants:

Multivalve, including the following accessories:

- gas-tight housing
- power supply bushing (pump/actuators)
- fuel pump
- vaporizer/pressure regulator
- shut-off valve
- non-return valve
- gas-tube pressure-relief valve
- service coupling
- flexible hose
- remote filling unit
- gas injection device or injector
- fuel rail
- gas dosage unit
- gas mixing piece
- electronic control unit
- pressure/temperature sensor
- LPG filter unit

2. **Marque de fabrique ou de commerce:**
Trade name or mark:

LOVATO

Type:
Type:

RGJ

Versions:
Versions:

not applicable

3. **Nom et adresse du fabricant:**
Manufacturer's name and address:

Officine LOVATO S.r.l.
Strada Casale, 175
I-36100 Vicenza

4. **Le cas échéant, nom et adresse du mandataire du fabricant:**

If applicable, name and address of manufacturer's representative:

not applicable

5. **Equipement présenté à l'homologation le:**
Submitted for approval on:

15.09. – 13.12.2006

6. **Autorité déléguée:**
Assigned authority:

Société Nationale de Certification et d'Homologation
L-5201 Sandweiler

Service technique chargé des essais d'homologation:

Technical service responsible for conducting approval tests:

Luxcontrol SA
B.P. 349
L-4004 Esch-sur-Alzette

7. **Date du procès-verbal délivré par ce service:**
Date of report issued by that service:

25.01.2007

8. **Numéro du procès-verbal:**
Number of report issued by that service:

LCA 54 309 020 6

9. **L'homologation est:**
Approval:

granted / extended / refused / withdrawn

10. **Raisons de l'extension (éventuellement):**
Reason(s) for extension (if applicable):

not applicable

11. **Lieu:**
Place: Sandweiler
12. **Date:**
Date: 25 janvier 2007
13. **Signature:**
Signature:

Pour le Ministre des Transports



A handwritten signature in dark ink, appearing to be "Paul Schmit".

Paul SCHMIT
Commissaire du Gouvernement

Pour la SNCH



Claude LIESCH
Conseiller de Direction

14. **Des copies soumis dans le dossier d'homologation ou d'extension de l'homologation peuvent être obtenues sur demande.**

The documents filed with the application or extension of approval can be obtained upon request.

see: Index to type-approval report

APPENDICE 1 (réservoirs uniquement)
APPENDIX 1 (containers only)

1. Caractéristiques du réservoir de base (config. 00)
Container characteristics from the parent container (configuration 00)

- a) Marque de fabrique ou de commerce:**
a) Trade name or mark: not applicable
- b) Forme:**
b) Shape: not applicable
- c) Matériau:**
c) Material: not applicable
- d) Ouvertures:**
d) Openings: not applicable
- e) Epaisseur de la paroi:**
e) Wall thickness: not applicable
- f) Diamètre (réservoir cylindrique):**
f) Diameter (cylindrical container): not applicable
- g) Hauteur (forme de réservoir spéciale):**
g) Height (special container shape): not applicable
- h) Surface externe:**
h) External surface: not applicable
- i) Configuration des accessoires fixés au réservoir (voir tableau 1):**
i) Configuration of accessories fitted to container (see table 1):

Tableau 1:

Table 1:

N° N°	Accessoires Item	Type Type	N° d'homologation Approval N°	N° d'extension Extension N°
a)	Limiteur de remplissage à 80%: 80% stop valve:	-	-	-
b)	Jauge: Level indicator:	-	-	-
c)	Soupape de surpression: Pressure relieve valve:	-	-	-
d)	Vanne d'isolement avec limiteur de débit: Remotely controlled service valve with excess valve:	-	-	-
e)	Pompe à GPL: Fuel pump:	-	-	-
f)	Bloc multivannes: Multi-valve:	-	-	-
g)	Enceinte étanche: Gas-tight housing:	-	-	-
h)	Raccord électrique d'alimentation: Power supply bushing:	-	-	-
i)	Soupape antiretour: Non return valve:	-	-	-
j)	Dispositif de surpression: Pressure relief device:	-	-	-

2. **Liste des réservoirs de la même famille (les listes des réservoirs de la même famille indiquent le diamètre, la capacité, la surface externe et la (les) configuration(s) possible(s) des accessoires fixés au réservoir):**

List of container family (The lists of the container family indicate the diameter, capacity, external surface and the possible configuration(s) of the accessories fitted to the container):

Tableau 2:

Table 2:

N° N°	Type Type	Diamètre/hauteur Diameter/height [mm]	Capacité Capacity [l]	Surface externe External surface [cm ²]	Configuration des accessoires Configuration of accessories [codes] ¹⁾
-	-	-	-	-	-
-	-	-	-	-	-

3. **Listes des configurations possibles des accessoires fixés au réservoir (indiquer la liste des accessoires possibles, qui diffèrent de la configuration essayée (code 00) et qui peuvent être fixés au type de réservoir en question. Pour tous les accessoires, préciser le type, le numéro d'homologation et le numéro d'extension, en indiquant pour chacun son propre code de configuration):**

Lists of the possible configurations of accessories fitted to the container (Specify a list of the possible accessories, which differ from the tested configuration of accessories (code 00) and which may be fitted to the type of container. Specify for all accessories, type, approval number and extension number, indicating its own configuration code):

Tableau 3:

Table 3:

N° N°	Accessoires Accessories	Type Type	N° d'homologation Approval N°	N° d'extension Extension N°	Configuration des accessoires [code] Configuration of accessories [code]
a)	-	-	-	-	-

¹⁾ **Biffer les mentions inutiles.**

Strike out what does not apply.



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Sandweiler, le 25 janvier 2007

INDEX DU DOSSIER D'HOMOLOGATION INDEX TO TYPE-APPROVAL

	Numéro d'homologation: Approval number:	E13*67R00*67R01*0286*00
	Révision: Revision:	00
	Marque de fabrique ou de commerce: Trade name or mark:	LOVATO
	Type: Type:	RGJ
1.	Procès-verbal d'essai: Test report:	N° LCA 54 309 020 6
	- Technical report:	Page(s) 1 to 7;
	- Index:	Annex A - Page(s) 1.
2.	Dossier du constructeur: Report of the manufacturer:	N° 309 020 6
	- Manufacturer's information document:	Page(s) 1 to 50.
3.	Autres documents annexés: Other documents annexed:	not applicable
4.	Date de délivrance de l'homologation initiale: Date of issue of initial type approval:	25.01.2007
5.	Date de la dernière délivrance de pages révisées: Date of last issue of revised pages:	not applicable
6.	Date de la dernière délivrance d'une homologation révisée: Date of last extension:	not applicable



No.: LCA 54 309 020 6

Inspection concerning the

**Specific equipment of motor vehicles using
liquefied petroleum gases in their propulsion
system**

performed according to

ECE – Regulation No. 67

Type: **RGJ**
 Manufacturer: **Officine Lovato S.r.l.**
Strada Casale, 175
I-36100 Vicenza

Extension -- to ECE Type Approval no.: not applicable

Index:

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3.	Evaluation of test results	Page	6
4.	Statement of compliance	Page	7
5.	Annex (beginning with an index)		

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Société Nationale de Certification et d'Homologation

L-5201 SANDWEILER (Luxembourg)

Organisme accrédité OLAS EN 45011

Accréditation N° 5/001 (Portée communiquée sur demande)

- **Luxcontrol SA**

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Fortis Banque Luxembourg
IBAN: LU56 0030 1612 0727 0000
BIC: BGLLLULL
Dexia-BIL
IBAN: LU48 0026 1824 1543 2600
BIC: BILLLULL



1. **General**

1.1. **Test Provisions**

The inspection was carried out according to the requirements of ECE-Regulation No. 67 including Supplement 6 to the 01 series of amendments, which entered into force on January 18, 2006.

1.2. **Information concerning the vehicle type and the requested approval**

The statements below apply to the previous ECE type-approval as referred to on page 1.

1.2.1. **[] Numbering according to the communication concerning the approval of ECE-R67**

[1.] LPG equipment considered:

Pressure Regulator / Vaporizer

- **Type: RGJ**

[2.] Trade name or mark:

LOVATO

[3.] Manufacturer's name and address:

Officine Lovato S.r.l.

Strada Casale, 175

I-36100 Vicenza

[4.] If applicable, name and address of manufacturer's representative:

Not applicable

[5.] Submitted for approval on: **September 15 to December 13, 2006**

[10.] Reason(s) of extension:

not applicable

...



2. Inspections and their results

2.1. Version of the tested equipment

The following variants have been used for testing (if not stated in part 1.2.1. of this report):

Not applicable

2.2. Inspection items

	Location of test:	Date of receipt of test item:	Date of test:	Inspector
Main	Bollate (Italy)	15.9.2006	15.9.2006-13.12.2006	D. Durazzi

2.2.1. General

The marking requirements according to item 4.1. and 4.2. of Part I of the Regulation are fulfilled.

Every material of the equipment in contact with LPG is compatible with it.

The installation of the component of the LPG-equipment has to comply with the relevant electromagnetic compatibility requirements according to the Regulation 10.02 series of amendments, or equivalent.

The part of the component referred to the inlet pipe, to the shut-off leverage until shutter is classified Class 1.

The part of the component referred to the bypass safety valve is classified Class 3.

The other parts of the component are classified Class 2.



2.2.2. Inspections: Annex 6; Class 1 and class 3 parts of the component

Tests	Test results	Line item
Overpressure test	no rupture or permanent distortion at a pressure of 6750 kPa	Annex 15, par. 4
External leakage test	leakage from stem or body seals or other joints less than 15 cm ³ / hour under a pressure of 6750 kPa at room temperature, - 20°C and + 120°C	Annex 15, par. 5
High temperature test	leakage from stem or body seals or other joints less than 15 cm ³ / hour under a pressure of 6750 kPa at + 120°C	Annex 15, par. 6
Low temperature test	leakage from stem or body seals or other joints less than 15 cm ³ / hour under a pressure of 6750 kPa at - 20°C	Annex 15, par. 7
Seat leakage test	no leakage occurred	Annex 15, par. 8
Endurance test	requirements fulfilled after having submitted the device to the 6000 cycles	Annex 15, par. 9
LPG compatibility	all the synthetic materials used satisfy the requirements	Annex 15, par. 11
Corrosion resistance	requirements fulfilled	Annex 15, par. 12
Resistance to dry heat	all the synthetic materials used satisfy the requirements	Annex 15, par. 13
Ozone ageing	all the synthetic materials used satisfy the requirements	Annex 15, par. 14
Creep	requirements fulfilled	Annex 15, par. 15
Temperature cycle test	requirements fulfilled	Annex 15, par. 16
Provisions regarding electrical insulation	requirements fulfilled	Part I, 6.15.2.
Provisions on valves activated by el. power	requirements fulfilled	Part I, 6.15.3.1.
Provision regarding heat exchange medium (compatibility / pressure)	requirements fulfilled	Part I, 6.15.4.
Provision regarding over-pressure bypass security	requirements fulfilled	Part I, 6.15.5.
Provision regarding gas flow prevention	Prevention of any gas flow when the regulator / vaporizer unit is supplied with LPG at a pressure ≤ 4500 kPa when the regulator is not operating.	Part I, 6.15.6.2.

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2.2.3. Inspections: Annex 6: Class 2 parts of the component

Tests	Test results	Line item
Overpressure test	no rupture or permanent distortion at a pressure of 1015 kPa	Annex 15, par. 4
External leakage test	leakage from stem or body seals or other joints less than 15 cm ³ / hour under a pressure of 675 kPa at room temperature, - 20°C and + 120°C	Annex 15, par. 5
High temperature test	leakage from stem or body seals or other joints less than 15 cm ³ / hour under a pressure of 675 kPa at + 120°C after 8 hours of conditioning at + 120°C	Annex 15, par. 6
Low temperature test	leakage from stem or body seals or other joints less than 15 cm ³ / hour under a pressure of 675 kPa at - 20°C after 8 hours of conditioning at - 20°C	Annex 15, par. 7
LPG compatibility	all the synthetic materials used satisfy the requirements	Annex 15, par. 11
Corrosion resistance	requirements fulfilled	Annex 15, par. 12
Provisions regarding electrical insulation	requirements fulfilled	Part 1, 6.15.2.
Provisions on valves activated by el. power	requirements fulfilled	Part 1, 6.15.3.1.
Provision regarding heat exchange medium (compatibility / pressure)	requirements fulfilled	Part 1, 6.15.4.
Provision regarding over-pressure bypass security	requirements fulfilled	Part 1, 6.15.5.
Provision regarding gas flow prevention	Prevention of any gas flow when the regulator / vaporizer unit is supplied with LPG at a pressure ≤ 4500 kPa when the regulator is not operating.	Part 1, 6.15.6.2.



2.3. Remarks

Inspection results are only applicable to items, which have been tested.

2.4. Test facilities

Calibration of measuring and test equipment used to carry out the inspections is in accordance with the EEC-Directive and/or ECE-Regulation stated in 1.1. of this report and with ISO 17025.

3. Evaluation of test results

3.1. Variants and equipment covered

The tests carried out cover the following variations as far as these are relevant for the gas unit:

- component parts and class as stated in the information document

3.2. Remarks

3.2.1. Main report:

Not applicable



4. **Statement of compliance**

The inspections items and measurements carried out have shown the compliance of the vehicle type described in this report and the attached Annex with the requirements of ECE-Regulation No. 67 including Supplement 6 to the 01 series of amendments, which entered into force on January 18, 2006.

Esch/Alzette, January 25, 2007

Luxcontrol s.a.
Service Homologation-automobile

David Durazzi
Ingénieur-Inspecteur

Fernand Haas
Ingénieur-Inspecteur

Annex



Index to the information package, including a summary in chronological order, concerning extensions and/or amendments

EEC type-approval No.: not applicable

Main Report

Technical Report No.: LCA 54 309 020 6 Page 1 to 7

Composition of the Annex:

A: Index Page 1

B: Information folder Page 1 to 50

Index to the information folder:

- manufacturer's information document (page 1 to 50)


 Responsabile tecnico
 Ing. Guido Gritti

Vicenza 23 gennaio 2007

RELAZIONE TECNICA

VAPORIZZATORE – REGOLATORE DI PRESSIONE GPL

TYPE “ RGJ ” CLASSE 1-2-3

INTRODUZIONE

Il componente in oggetto è un vaporizzatore – regolatore di pressione con elettrovalvola integrata in ingresso del riduttore, per l'alimentazione di motori a combustione interna a ciclo otto.

DESCRIZIONE DEL COMPONENTE

(A) Il regolatore di pressione è costituito da un corpo riduttore, da un otturatore, da una membrana, da un piattello, da un sistema a molla per la riduzione della pressione e da un coperchio detto superiore. Questi componenti dello stadio di riduzione hanno la funzione di ridurre la pressione del GPL proveniente dall'elettrovalvola in ingresso del corpo ad un valore variabile fino a un massimo di 1,3 bar relativi al MAP. La pressione di esercizio non supera mai i 4,5 bar relativi e quindi il componente è classificato in classe 2.

(B) Il vaporizzatore è costituito da un corpo e da un coperchio detto inferiore. Esso svolge la funzione di scambiatore di calore acqua-GPL al fine di garantire al GPL la completa gassificazione ed una temperatura tale da evitarne la condensazione lungo il circuito di alimentazione al motore.

(C) L'elettrovalvola di intercettazione in fase liquida è integrata nel corpo riduttore, è un dispositivo elettromagnetico che impedisce il passaggio del GPL proveniente dal serbatoio in assenza di alimentazione elettrica. È posizionata all'ingresso del circuito gas, dopo il filtro(2) che ha la funzione di pulire il GPL, ed è costituita da un nucleo mobile(6), un nucleo fisso, un tubo guida detto campanile e da una bobina(7) alimentata +12V.

FUNZIONAMENTO DEL COMPONENTE

AFFLUSSO DI GPL E RIDUZIONE DI PRESSIONE (A)

Il GPL allo stato liquido spinto dalla pressione esistente nel serbatoio entra dall'ingresso (1) e arriva all'interno del filtro (2). Attraverso il canale (4) entra nella parte superiore dell'elettrovalvola (5) dove si trova il nucleo mobile (6) comandato dall'elettromagnete (7). Questo apre il foro di comunicazione con il canale (8) che porta il GPL sotto l'otturatore (9). Attraversa l'otturatore (9), esce dai fori dell'ugello (10) e arriva nella camera di uscita ridotto alla pressione variabile come citato al punto (A). Tale pressione è relativa a quella esistente nella camera superiore della membrana, posta in comunicazione pneumatica con il collettore d'aspirazione del motore a valle della valvola a farfalla. La riduzione della pressione è eseguita tramite l'otturatore (9) azionato dalla membrana (12), dalla molle inferiore (17) e dal sistema a molla (13) superiore tarabile con la vite di registro (15).

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 Ing. Guido Gritti

Il GPL a pressione regolata fuoriesce quindi dal componente attraverso il raccordo di uscita (16) ed è spinto dalla differenza di pressione con il collettore d'aspirazione verso il circuito d'alimentazione del motore.

Dal raccordo d'ingresso (1), attraverso l'elettrovalvola (6), fino all'otturatore (9), il componente è in contatto con la pressione del serbatoio ed è classificabile in classe 1 del Regolamento ECE 67 R01. Dall'otturatore (9) fino all'uscita (16), essendo la pressione di esercizio sempre inferiore a 4.5 bar il riduttore è classificabile in classe 2. Inoltre la presenza dell'elettrovalvola di chiusura (5,6,7), che opera in fase liquida, fa rientrare il componente anche in classe 3.

VAPORIZZAZIONE E RISCALDAMENTO DEL GPL (B)

Durante il transito del GPL, dall'ingresso (1), attraverso il filtro (2), l'elettrovalvola (5), il canale di collegamento (8) fino a sotto l'otturatore (9), avviene una prima fase di riscaldamento della fase liquida. Questo è indotto dalla temperatura del corpo riscaldato dal circuito acqua del motore che entra dal portagomma (21), gira nel circuito acqua del corpo (18) ed esce dal portagomma (22) per tornare nel motore.

La vaporizzazione invece avviene in parte durante la laminazione di regolazione della pressione attraverso l'otturatore (9) e completata nella camera (11) che innalza anche la temperatura per scongiurare il fenomeno di condensazione lungo il circuito di alimentazione del motore.

ELETTROVALVOLA DI INTERCETTAZIONE (C)

Vedere al punto (C)

ALLEGATI

- Disegno d'assieme del riduttore "RGJ"
- Disegni costruttivi di tutti i particolari.

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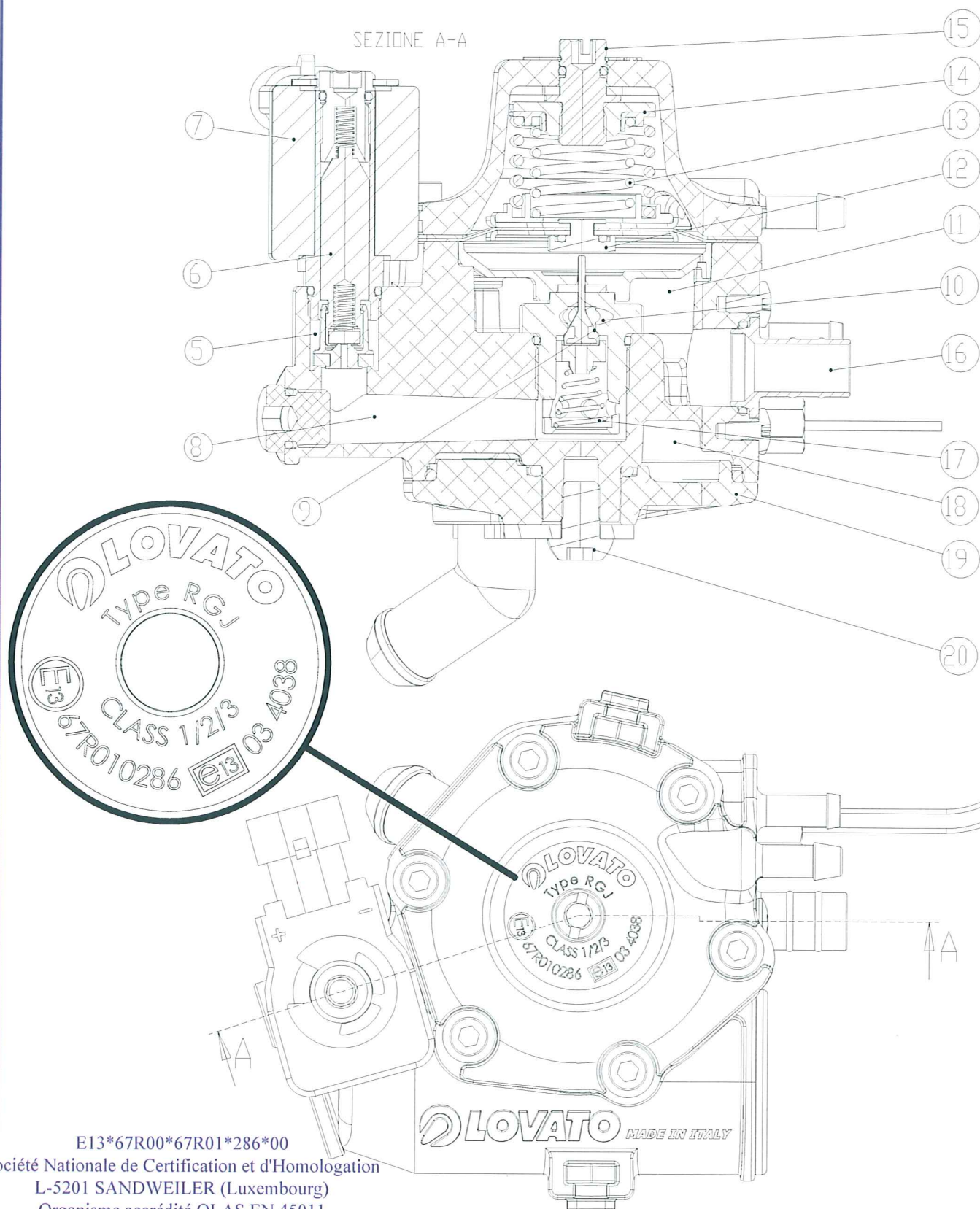
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Responsabile tecnico

Ing. Guido Gritti

SEZIONE A-A



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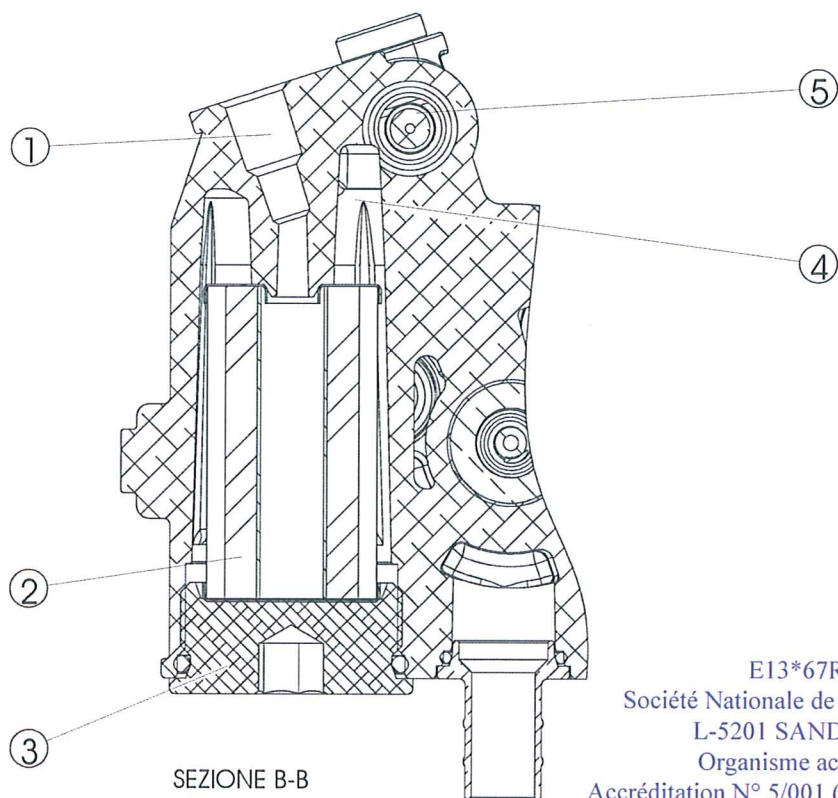
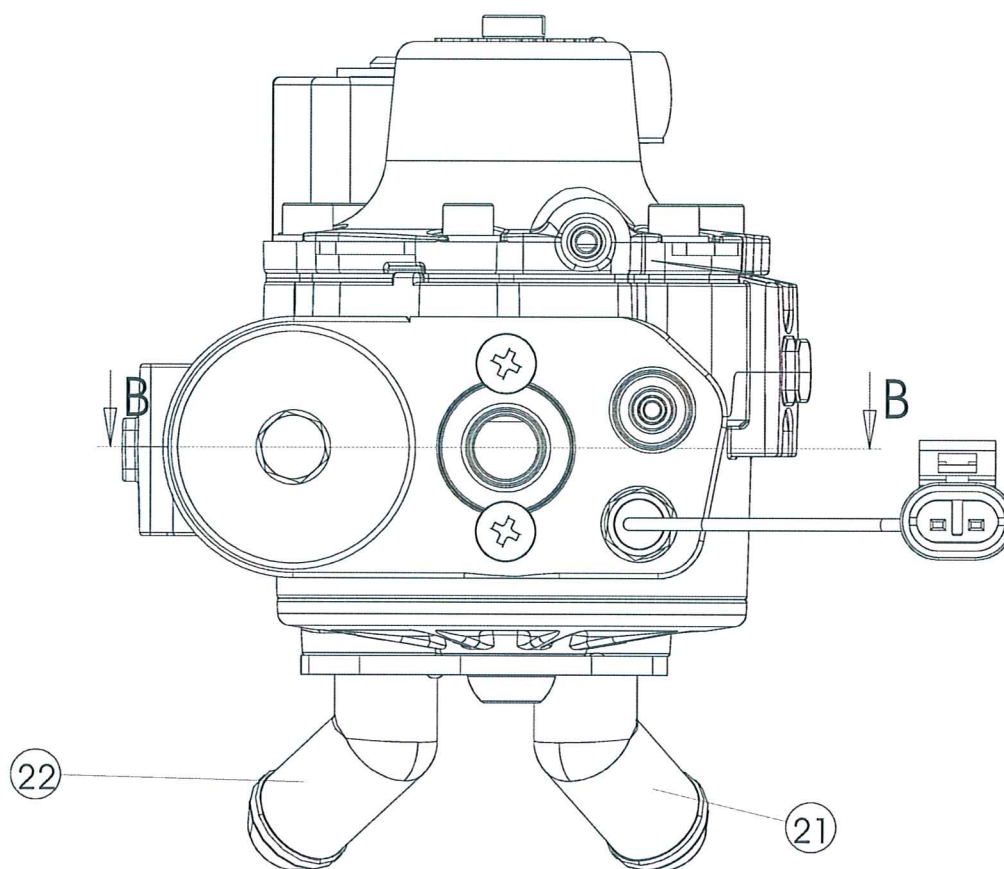
Accréditation N° 5/001 (Portée communiquée sur demande)

Officine LOVATO Strada casale, 175 - 36100 Vicenza (Italia) Tel. ++39-0444.218911 - Fax ++39-0444.501540

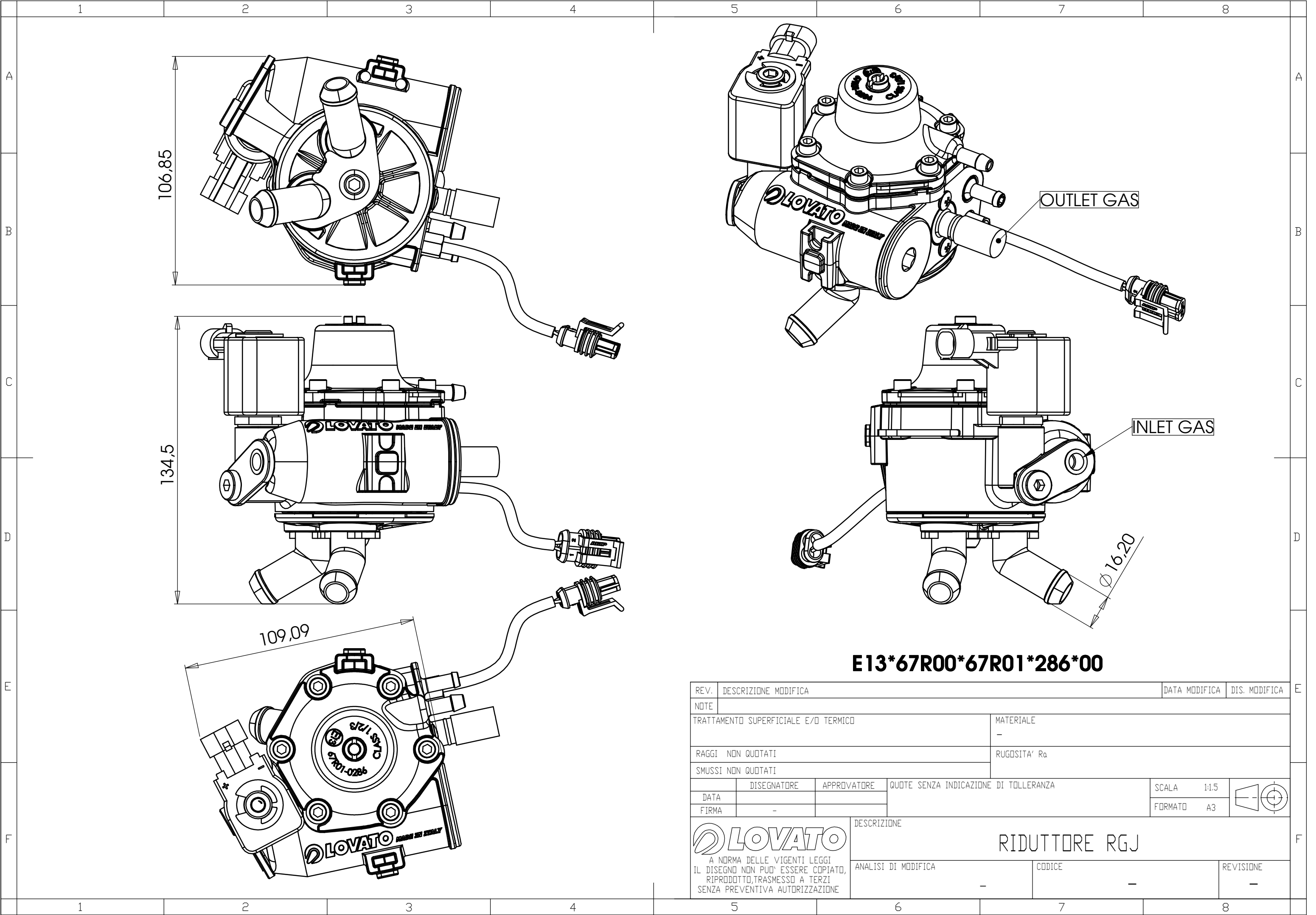
e-mail: info@lovatogas.com - <http://lovatogas.com>



Responsabile tecnico
Ing. Guido Gritti



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REV.		DESCRIZIONE MODIFICA				DATA MODIFICA		DIS. MODIFICA	
NOTE									
TRATTAMENTO SUPERFICIALE E/O TERMICO				MATERIALE					
				-					
RAGGI NON QUOTATI				RUGOSITA' Ra					
SMUSSI NON QUOTATI									
	DISEGNATORE	APPROVATORE	QUOTE SENZA INDICAZIONE DI TOLLERANZA				SCALA	1:1,5	
DATA							FORMATO	A3	
FIRMA	-								
			DESCRIZIONE						
A NORMA DELLE VIGENTI LEGGI IL DISEGNO NON PUO' ESSERE COPIATO, RIPRODOTTO, TRASMESSO A TERZI SENZA PREVENTIVA AUTORIZZAZIONE			RIDUTTORE RGJ						
			ANALISI DI MODIFICA			CODICE		REVISIONE	
			-			-		-	