



MANUALE DI PRESENTAZIONE
PRESENTATION MANUAL



A LINDSAY TRANSPORTATION SOLUTIONS COMPANY

Via F. Baracca 19/23
20056 Trezzo sull'Adda (MI)
Tel +39.02909961 Fax +39.0290996200
e-mail export@snoline.com - commerciale2@snoline.com
www.snoline.com



A LINDSAY TRANSPORTATION SOLUTIONS COMPANY

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INTRODUCTION

As everyone knows, motorways, highways and, more generally, dual carriageways are protected in the central reserve by strong restrain barriers, made of reinforced concrete or, more frequently, of steel, which offer the capacity to stop small and heavy vehicles, while providing protection for those inside, as required under national and European standard, generally falling within the H2 and H3 classes of performance. These barriers are interrupted at set intervals with paved areas to allow vehicles to change carriageway (in case of accident or road works or to allow service vehicles to pass).

These areas are generally known as "gaps" in the longitudinal barrier and have an average opening of 20 to 40m.

The frequency of these gaps depends on the environmental conditions, on the need for road maintenance, on the presence of exits or other features. They can be very close one another in case of heavy traffic or lack of exits.

These gaps are very dangerous: accidents caused by U-turns or vehicles passing through the gap have disastrous effects, even if such accidents are isolated events.

With the increase of traffic levels such accidents are very serious.

Indeed, a vehicle crossing the gap may often hit one or more oncoming vehicles: the sum of the kinetic energy of the vehicles involved in the crash increases the severity of the impact, mostly for the occupants, who will probably die.

Moreover, even the end of the barrier on the opposite side of the gap may constitute a serious hazard for the motorists, if not properly protected (with a crash cushion).

For these reasons, the possibility of ridding gaps has been considered several times, replacing them with fixed structures like normal safety barriers.

However, this solution is not generally accepted because emergency vehicles snowploughs, or other kind of work zones vehicles shall be allowed to pass through and contraflows are needed in the event of serious accidents blocking one carriageway for several hours or in case of big road works.

These reasons, which might be reconciled with the safety of those using the road, call for the adoption of an effective closing system, but one that, at the same time can be easily and quickly removed when necessary and urgent.

As gaps are of variable length their closing systems might be adapted and adaptable to different length as well and have to absorb the impact with a very low lateral dynamic deflection.

Sometimes it may be useful to have the possibility of opening only a small part of the gap, to allow a single control or emergency vehicle through; thus the system might be flexible, allowing the opening of single elements without opening the complete gap.

PRODUCT DESCRIPTION

The S-A-B[®] system presents a cost-effective solution to the problem of providing openings in median barrier. Highway agencies and local governments need this capability for emergency vehicle access and evacuation, traffic re-routing, and work zone and maintenance applications. The S-A-B[®] system is a simple approach to a serious problem. The system can be opened and closed, partially or totally, without expensive electrical power supplies or sophisticated controls system, and secure lock systems can be provided to assure authorized usage only.

The S-A-B[®] system allows impact absorption with reduced dynamic deflection and redirection of small and heavy vehicles at a small angle.

The S-A-B[®] system, according to the definition in ENV 1317-4, is a *removable barrier section* (special transition) specifically created for gaps between barriers in the central reservations of roads and motorways. Its special feature consists in the fact that it can be opened fully or in part as required, quickly and without the need for equipment.

The section consists of a given number of *standard modules*, connected by hinges, to allow for compass opening (where space and traffic conditions allow), to create either total or partial deviation and then shifted sideways or lengthwise to open a passage of the required width.

At either end of the section ground *anchors* discharge any longitudinal force produced when vehicles hit the modules, meaning that the section is independent of the type and class of fixed barriers already existing on the road and does not transmit noticeable forces to these. In practice, the system can also be installed without needing to connect it to the fixed barriers where possible, thus increasing safety.

However, a safe section should generally be connected safely to the fixed barriers in order to guarantee continuous motion for a vehicle during impact and to avoid the risk of dangerous jolting. For this reason, the S-A-B system can be installed with suitably sized *couplings* that allow it to be connected safely to all types of safety barriers currently in use (both steel and concrete).

CONFIGURATION

The S-A-B system consists of a given number of *mobile modules* (8 in the tested configuration), that can be completely detached from the rest of the device or turned upon a vertical axis between modules or at the start/finish anchor points.

Each module is 4340 mm long and consists of 4 supports taking the shape of a frame on sliding blocks made from welded metal profiles. Seen from the front: 1 RH support (top), 1 LH support (bottom), 2 central supports. These supports are fixed on both sides to two longitudinal profiles: 1 panel with 3 beams (3 mm thick) at the top and 1 wheel deflector rectangular tubular bar at the bottom.

Each module can be moved individually thanks to 2 wheel systems connected to the 3-beam panels via a jack-operated lever. This keeps the wheels raised when not in use and lowers them when required. It also lifts the module to the required height during movement.

The modules are connected together by means of 2 *steel pins* that slot into holes in the plates connected to the RH and LH supports.

The modules are also anchored by a *removable tubular steel frame post*, that is slotted into a sleeve inserted about 700 mm in the normally compacted terrain. This post is made from a tube measuring 83 mm in diameter and 3 mm thick; it is inserted in the sleeve in the ground upon closing the module and acts as a local restraint. When the module needs to be opened, the post is lifted from the ground either manually or using mechanical means (winch).

The device is fixed to the ground at either end by means of two terminal supports made from welded steel profiles; these are anchored to the ground by means of three stakes made from IPE 120 profiles.

The system is completed by *couplings* that connect it to the main types of metal crash barriers and concrete barriers (such as New Jersey crash barriers) to guarantee continuity.

These couplings (in the case of the configuration tested) are made from 3-beam Z-shaped plates that fit onto the anchor terminals and the existing barrier, being secured by screws. To ensure that they are strong enough, they are anchored by C-section posts 1.33 m apart and sunk into the ground by c. 0.9 m.

The test configuration was installed on the lab test track covered with blacktop and having the specifications given on page 47 of each test report. This road surface was chosen as being representative of current road surfaces where central barriers are paved to allow for traffic to pass through during road works (contra-flow) or in the event of an emergency.

The system tested consisted of 8 removable modules, connected to two anchor terminals clad with transition protection panels suitable to resist impact autonomously. The protection panels were fitted to two sections of barrier above and below the system to simulate an actual gap. The barrier used was a class H4 barrier, corresponding to the most hazardous scenario, since its strength was greater than that of the system section.

HOW IT WORKS

The S-A-B system acts as a safety barrier for central reservations, covering gaps in the fixed crash barrier.

The impact force applied by vehicles is transmitted through the modules to the anchors at either end, while the system itself arcs to recover play. The tubular posts in each module help minimise the lateral reaction and limit overall lateral deformation.

The wheel redirecting guides made from longitudinal tubular steel running along the bottom of the system help prevent small vehicles from coming into contact with the rigid parts below and the support feet: any such contact may cause high dangerous acceleration and jolts for the occupants in the vehicle. These guides also help increase the flexural and tensile strength of the system. The terminal cladding and the fixed barrier connection system proposed mean the hard points in the anchors and the start of a crash barrier of a higher class or lower working width are avoided, without creating risks for the occupants of the vehicle.



WHY CHOOSING S-A-B®:

S-A-B® is suitable for all road types with a median barrier: Motorways, country roads, city streets for all speed categories.

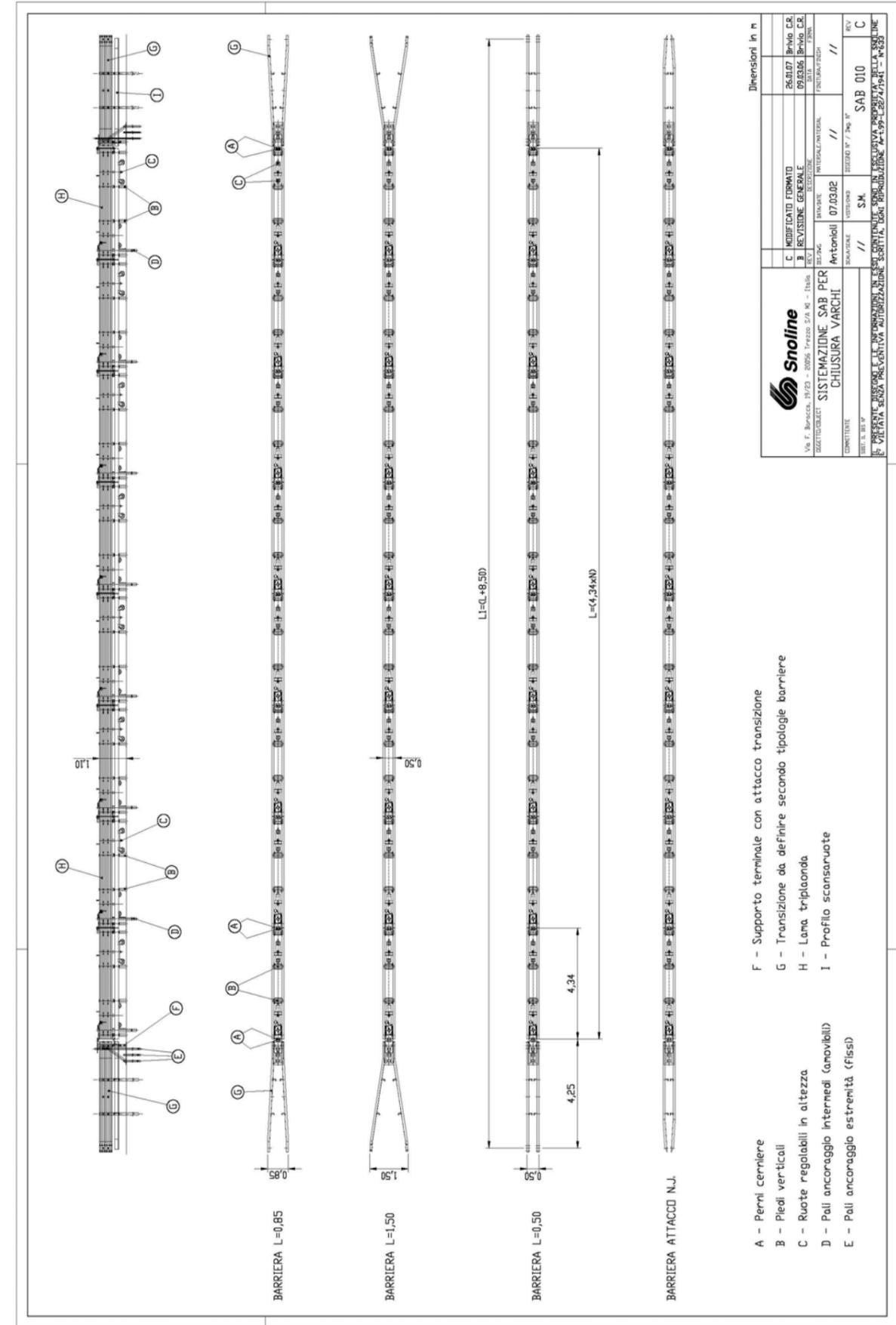
S-A-B® is very easy to install. With the use of proper tools and trained crew of 4 workers, the estimated time for installation is about 4 hours depending on site conditions, traffic, size and experience of work crew, and quality of tools.

S-A-B® is very easy to use. Complete opening/closing requires about 10 minutes and 2 people. It needs only a shear and can be done by the assistance staff .

S-A-B® is very flexible. It is adaptable to all kind of opening and to different kind of barrier. Snoline is able to study connections to most exiting barrier, besides the standard ones.

S-A-B® is very easy to maintain and cheap to repair.

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INSTALLATION

The system is assembled before shipment. The system is supplied with modules already fitted and with terminals, fixing posts and barrier couplings, where required.

Define the transition axis and then measure and mark (using a pile driver) the points where the sleeves for the removable posts are required.

Place the modules along the barrier using the wheels as required. Insert the posts in the modules and then into their sunk sleeves. Adapt the contrast plates.

Insert the hinge pins in the modules.

Place the terminal supports in position and then sink the guardrail post with a pile driver.

Fit the transition units, starting from the wheel guide beam, insert the posts in their holes and then connect the panels. Fix the closure devices.

The couplings used must be suitable for the specific type of barrier to which the S-A-B[®] system is to be fitted. Couplings for metal or concrete barriers (single or double) with max width 850mm. Non standard couplings for barriers with different dimensions.

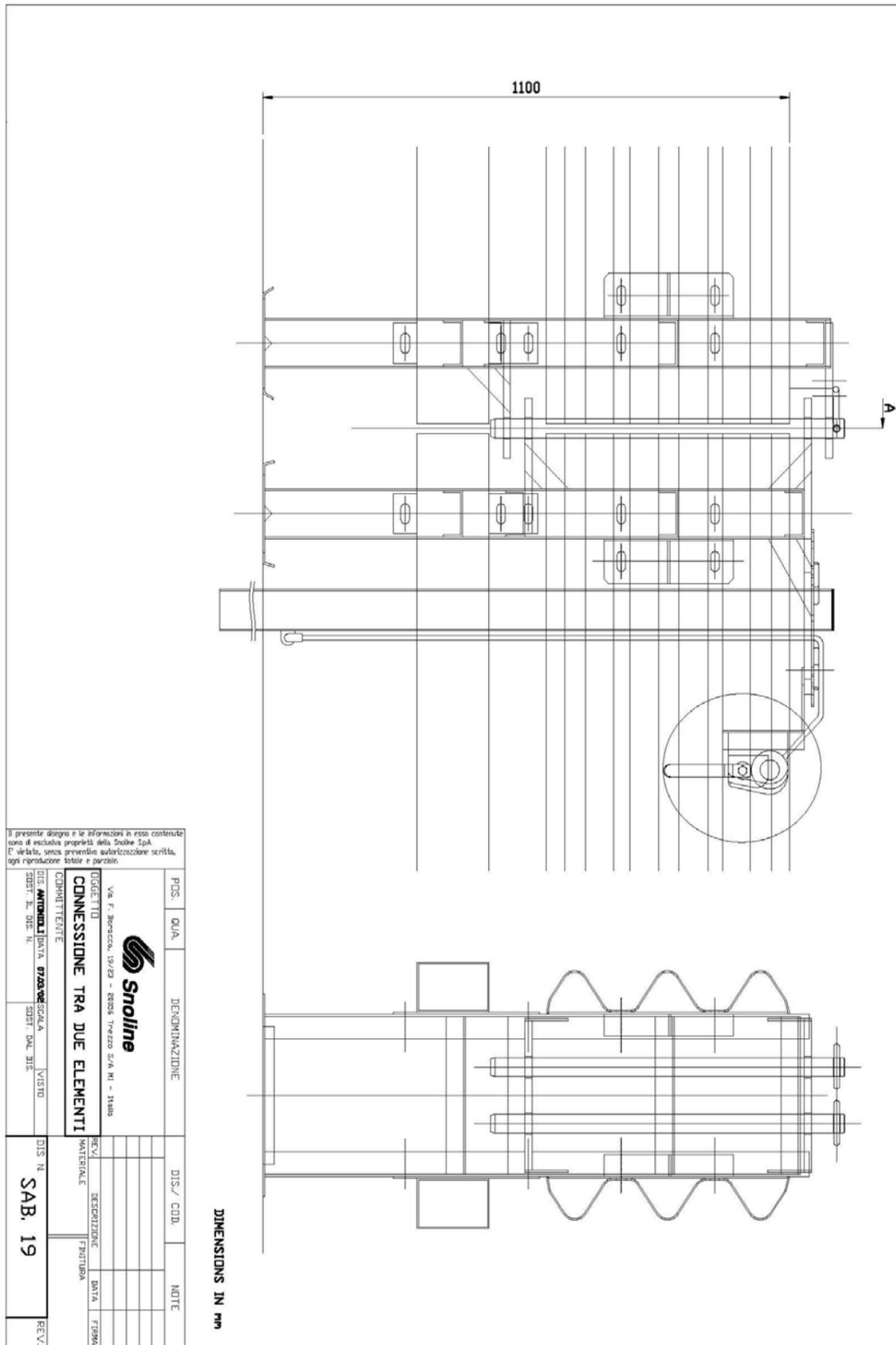
Take the measurements accurately when positioning the holes for the anchor posts and terminals, as the system must be fitted with min tolerance. Take care during installation not to damage the lifting and moving systems.

Before installation you must check that there are no manholes, drains or utility lines lying under the ground at the point where you want to drill holes in the road.

If the device is to be installed on an existing concrete surface, bore some holes before using the pile driver.

The surface on which the S-A-B[®] system sits must be level with the road surface, otherwise it will be hard to open the modules.

For more details please ask for the installation and maintenance manual.



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SPECIFICATIONS

The device is a *safety barrier transition*, as defined by the European Standard. The S-A-B[®] gap closing system is suitable for all the types of road with a central reservation, i.e.:

- Motorways
- Major highways
- Minor country roads
- Major urban throughways
- City streets
- Local streets

and for all speed categories.

Road surfaces upon which the S-A-B[®] system is placed must be strong enough to allow for anchoring (standard terrain) and the passage of vehicles when open. The system can therefore be used on normal blacktop on a compact stabilised sub-stratum, on concrete or existing paving.

The tests were carried out in accordance with the provisions of European Standards ENV1317-4, paragraph 6.2 .

The critical impact points, as specified in paragraph 6.3.3 of UNI ENV1317-4, were:

- $\frac{3}{4}$ of the length of the system in the direction of impact in the case of light vehicles;
- $\frac{1}{2}$ of the length of the system in the direction of impact in the case of heavy vehicles (bus).

The class H2 tests were passed in compliance with standard criteria.

The vehicles were redirected without entering the obstacle with an exit trajectory that fell within the values in the "CEN box" and with a small exit angle.

The vehicles remained in contact with the ground without meaningful changes in their equilibrium.

No system elements penetrated the vehicles; the vehicle cabs were not dented significantly and no parts fell off.

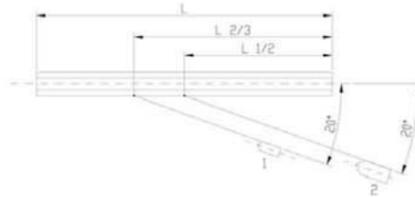
The vehicles received only minor damage and the bus was able to drive off under its own steam after the test.

TEST	VELOCITY KM/H	IMPACT ANGLE	TOTAL VEHI- CLE MASS KG	VEHICLE
TB 11	100	20	900	CAR
TB 51	70	20	13000	BUS

CRASH TESTS TABLE

REUSABILITY

GATE SYSTEM S-A-B® IMPACT TESTS



KEY

1 - Test 1

2 - Test 2

TEST	APPROACH	TOTAL VEHICLE MASS (KG)	VELOCITY (KM/H)	FIGURE TEST NR.	ASI SEVERITY "A" ≤1	PHD INDEX VALUE ≤20G	THIV (KM/H)
TB 51	SIDE IMPACT 20°	13000	70	2	0.3	(*)	(*)
TB 11	SIDE IMPACT 20°	900	100	1	1	16	24

(*) In the event of bus or truck impact it is not calculated

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S-A-B® is 75% reusable. This value was calculated on the base of the crash tests done.

In the event of an accident shape the system again, as positioned at the installation. Particularly, if the device might be partially or totally damaged, it is absolutely necessary to verify which parts are deformed and which one are ruined. The more critical parts are the one of the elements, particularly the anchorage pickets, which are inserted in the sleeves and the moving parts which, in case of following shifting are more fragile and important; nevertheless it is suitable to verify the condition of each element. The replacement of the elements, of single element component or other system's parts should follow the same indication effective for the system's installation.

FAQ

1. What is a gap?

A gap is an opening in the central reservation crash barrier which is located on dual carriageways that provides a point where in special circumstances vehicles may cross over from one carriageway to the other. For example the gap may benefit emergency vehicles or providing a traffic contra-flow when major accidents or maintenance works take place.

2. What are the risks of leaving a gap permanently open?

The gap provides an un-protected cross over point where a vehicle could cross over into the path of an approaching vehicle on the adjoining carriageway with horrific accident consequences.

3. What is an opening gap?

A high containment vehicle restraint system placed between the ends of existing crash barriers which can be partially or totally opened in a few minutes.

4. What properties must an opening gap have?

It must withstand impacts from buses which are the fastest heavy goods vehicles travelling on motorways.

It must withstand a small car impact so that the occupants will not suffer from high-ASI- acceleration / deceleration levels and the passenger compartment is minimally damaged.

It must have a suitable working width - deflection - so that it can fit into the available central reservation width, even where it is particularly narrow.

5. What are the design features of the S-A-B[®] opening barrier?

S-A-B[®] has been designed to work with most of the vehicle restraint systems which meet the EU Standard EN1317. It meets the requirements of ENV 1317 -4 :

- at the H2 –bus- level when the unit buckled by about 1m without causing serious damage to the bus which was driven away from the crash site without any external help.
- at the TB11 –900 kg car- level when an ASI level of 1 (class A) was recorded and no car windows shattered.

6. What are the ideal requisites for an opening gap?

Service personnel should be able to open the gap in just a few minutes so that an emergency situation can be quickly responded to. Two types of openings should be allowed for:

- emergency opening say 4 m wide
- traffic diversion to allow contra-flow two or four lanes wide

7. How does the S-A-B[®] barrier open?

The S-A-B[®] module units have wheels which are lowered by their screw cranks to the ground. The module units have connecting hinge pins and posts which can be removed depending on how many module units are to be opened.

Emergency passage can be obtained by removing a module and moving it one side.

The entire unit may be opened by lowering the wheels and removing the central hinge pins and pushing the modules to one side. The action is similar to that required to open a gate. Time taken to do this is between 5 and 10 minutes and no special tools are needed.

8. Why is the point between the opening gap unit and the existing fixed crash barrier so important?

The space or gap at this point must not be too wide and the correct fittings and connections must be made so that vehicles will not be caught (or pocketed) up in it. A head on crash impact against the end of the fixed crash barrier could cause a horrific accident if the gap is too wide.

9. What is the connection between the S-A-B[®] and the fixed crash barrier made?

The S-A-B[®] opening barrier is provided with special couplings which are designed to be fixed to the adjoining crash barrier. These couplings are designed to withstand crash impacts and to suit the form of the adjoining crash barrier which may be in steel or concrete construction.

10. How is the S-A-B[®] opening barrier supplied?

The package is made up of pre-assembled 4,3 m long steel modules, 2 anchorage units with posts and couplings to suit the adjoining crash barrier.

11. How is the S-A-B[®] opening barrier installed and how long does it take?

Installation instructions describe the procedures and equipment required. Installation will take account of the site specific Health & Safety plan including arrangements for traffic management.

A pre-formed hard surface is required so that the wheels have a smooth path when the barrier is opened or closed. The installation equipment needs to include :

- Post driver for the cable anchorage posts
- Lorry mounted crane
- Small tools –shovels, spanners ,sweeping brushes etc.
- Plus 3 trained personnel

The time taken is usually four hours including the time to make the couplings to the adjoining side crash barrier but this excludes the time to put up and take down the traffic management system or to form the hard surface or take out existing barriers to form the opening.

12. What maintenance is required for the S-A-B[®] opening barrier?

Maintenance instructions describe the procedures and equipment required .An annual inspection is recommended including the cleaning and protection measures so that excessive amounts of dirt and rubbish do not build up particularly at the hinged joints which will assure best performance when regularly lubricated.

13. How is the S-A-B[®] opening barrier repaired after a crash and how long does it take?

Repair instructions describe the procedures and equipment required which will take account of the site specific Health & Safety plan including arrangements for traffic management.

The work usually involves :

- An initial thorough examination to identify all damage
- Replacement of all damaged components (panels, posts, supports, etc.)
- Check and replace, if necessary, the anchorage posts and connections to adjoining crash barrier
- Plus 3 trained personnel and usual tools.

14. What is the minimum drilling depth that guarantees the functioning of the system?

S-A-B[®] can be anchored on concrete with a grouting depth of 500mm and terminals and connection posts are fixed with threaded bars in concrete too. In this way a drilling of 700mm can be avoid, guarantying the correct functioning of the S-A-B[®] system.

DRAWINGS

ANNEXES

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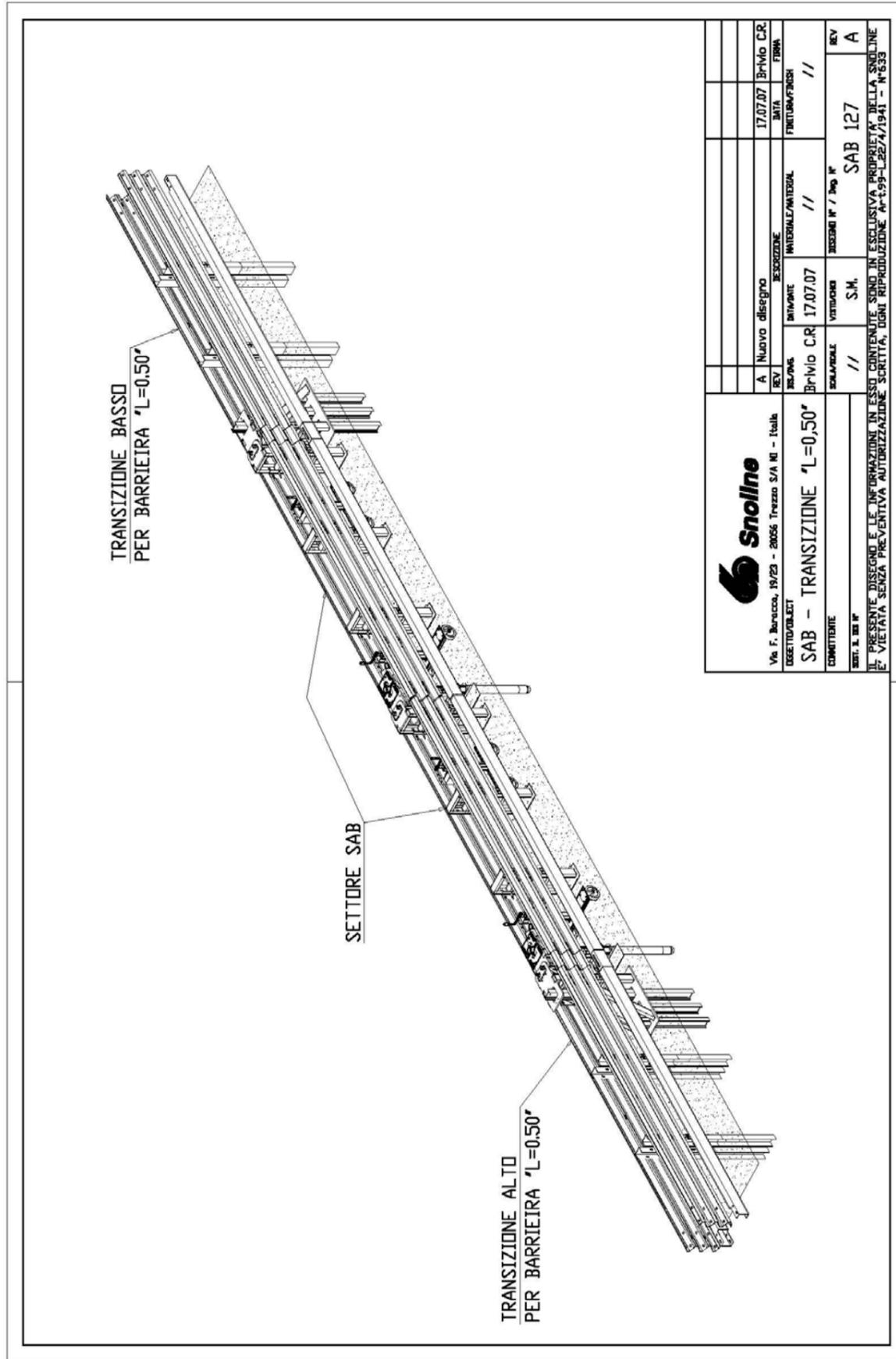
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TRANSIZIONE ALTO
PER 'NEW JERSEY'

SETTORE SAB

TRANSIZIONE BASSO
PER 'NEW JERSEY'

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DESTINATARI SAB - TRANSIZIONE 'NEW JERSEY'	REVISIONI A Nuovo disegno B Aggiornato	EMISSIONE 17/07/07	DATA 02/12/08
COMMITTEE //	VERIFICHE S.M.	SEZIONI N° / 250 N° //	FINE/INIZIO //
SOTT. A. 001 N°	SOTT. A. 001 N°	SOTT. A. 001 N°	SOTT. A. 001 N°
IT - PRESSO LE DISSEGNATE E LE INGEGNERIE IN ESSO CONTENUTE SONO IN ESCLUSIVA PROPRIETA' DELLA SNOLINE E' VIETATA SENZA PREVENTIVA AUTORIZZAZIONE SCRITTA, OGNI RIPRODUZIONE AL 499-0227/1941 - N.533			



PICTURES





CRASH TESTS RESULTS

Hereinafter the crash tests results. The complete crash tests reports are available at Snoline s.p.a.



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Inrets Road Equipment Test Laboratory

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Rapport d'essai Test report Rapporto prova eseguita su

**Barrière d'interruption de terre-plein central
Emergency/maintenance crossover point
Sistema amovibile per chiusura varchi**

S.A.B.

SNOLINE S.p.A.

SNO/SAB-03/587

Approbation/Approval/Approvazione :

B. MOUNIER
Directeur général adjoint technique

le 22/ VII /02

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La version en langue française fait foi.

The official version of this report is written in French.

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Adresse postale : D 29 - Route de Crémieu
BP 352 - 69125 Lyon Saint-Exupéry Aéroport
Tel. 04 72 48 37 30 - Fax 04 72 48 37 37
N. de dépôt : 393 008 - TRAF 000 0

S.A. au Capital de 125 000 €
Siège Social : D 29 - Route de Crémieu
69124 Colombarin Saughieu
Régistration 393 008 TRAF - 000 0

		Barrière d'interruption de terre-plein central Emergency/maintenance crossover point Sistema amovibile per chiusura varchi S.A.B. SNOLINE S.p.A.	N° : SNO/SAB-03/587 page/pagina : 11 / 57
9. Fiche résumé Type d'essai : Test d'une barrière d'interruption de terre-plein central, essai d'acceptation TB51 suivant les normes européennes EN 1317-1, 2 et 4 (chapitre 6 «raccordements»).	9. Summary Test type : Test of an Emergency/maintenance crossover point, as acceptance test TB51 in compliance with European standards EN 1317-1, 2 and 4 (chapter 6, «Transitions»).	9. Scheda riassuntiva Tipo di prova : Collaudo di una barriera a chiusura varchi, prova TB51 in base alle norme Europee EN 1317-1, 2 e 4 (capitolo 6 «Transizioni»).	
Conditions initiales réelles Vitesse d'impact / Impact speed / Velocità d'impatto +3,4 % par rapport à la vitesse visée / from target speed / rispetto alla velocità mirata	Actual test conditions Angle d'impact / Impact angle / Angolazione d'impatto 0° par rapport à l'angle visée / from target angle / rispetto all'angolo mirato	Condizioni reali iniziali : 72,4 km/h : 20,0° : 12740 kg	
Résultats Véhicule : - Les valeurs de vitesse et d'angle sont comprises dans les limites de tolérances. - Le véhicule ne franchit pas le dispositif. - Le véhicule ne brise pas la barrière. - Le véhicule ne se renverse pas sur la zone d'essai. - Le véhicule reste dans la limite de la boîte CEN. - Aucun élément du véhicule n'est détaché.	Results Vehicle : - Velocity and angle values were within tolerance limits. - The vehicle did not pass over the device. - The vehicle did not breach the barrier. - The vehicle did not roll over within the test area. - The vehicle remained into the CEN Box. - No part of the vehicle was detached.	Risultati Veicolo : - I valori di velocità e di angolazione rientrano nei limiti tollerati. - Il veicolo non supera il dispositivo. - Il veicolo non sfonda la barriera. - Il veicolo non si capovolge all'interno della zona di prova. - Il veicolo rientra nei limiti della Box CEN. - Nessun elemento del veicolo è staccato.	
ASI (essieu avant/front axle/asse anteriore) : 0,3 ASI (essieu arrière/rear axle/asse posteriore) : 0,3 Angle de sortie/Exit angle/Angolo di uscita : 5,5°			
Dispositif : - Aucun élément de la glissière n'a été éjecté. - Aucun élément de la glissière n'a pénétré l'habitacle.	Device : - No part of the barrier was ejected. - No part of the barrier penetrated the interior of the vehicle.	Dispositivo : - Non si verificano espulsioni di elementi dal dispositivo. - Nessun elemento della barriera è penetrato nell'abitacolo.	
Longueur de contact / Contact length / Lunghezza di contatto : 17,7 m Déflexion statique maximale / Permanent deflection / Massima deflessione statica : 1,16 m Déflexion dynamique maximale / Dynamic deflection / Massima deflessione dinamica : 1,6 m Position latérale extrême / Extreme lateral position / Posizione laterale estrema : * du dispositif / of the device / del dispositivo : 2,1 m * du véhicule / of the vehicle / del veicolo : 1,9 m Largeur de fonctionnement / Working width / Larghezza di funzionamento : 2,1 m Niveau de fonctionnement / Level of working width / Livello di funzionamento : W6 ≤ 2,1 m			



Laboratoire d'essais Inrets Equipements de la Route
Inrets Road Equipment Test Laboratory

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Rapport d'essai Test report Rapporto prova eseguita su

Barrière d'interruption de terre-plein central Emergency/maintenance crossover point Sistema amovibile per chiusura varchi

S.A.B.

SNOLINE S.p.A.

SNO/SAB-04/604

Approbation/Approval/Approvazione :

B. MOUNIER
Directeur général adjoint technique

le 22 | VII | 02

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ACCREDITATION
N° 1-0851
PORTÉE
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Tél. 04 72 48 37 30 Fax 04 72 48 37 37
N° SIRET 393 068 796 00019

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Siège Social D 29 - Route de Crémieu
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CE CERTIFICATE

	Barrière d'interruption de terre-plein central Emergency/maintenance crossover point Sistema amovibile per chiusura varchi S.A.B. SNOLINE S.p.A.	N° : SNO/SAB-04/604 page/pagina : 11 / 60
9. Fiche résumé	9. Summary	9. Scheda riassuntiva
Type d'essai : Test d'une barrière d'interruption de terre-plein central, essai TB11 suivant les normes Européennes EN 1317-1, 2 et 4 (chapitre 6 «raccordements»).	Test type : Test of an Emergency/maintenance crossover point, acceptance test TB11 in compliance with European standards EN 1317-1, 2 and 4 (chapter 6 «Transitions»).	Tipo di prova : Collaudo di una barriera a chiusura varchi, prova TB11 in base alle norme europee EN 1317-1, 2 e 4 (capitolo 6 «Transizioni»).
Conditions initiales réelles	Actual test conditions	Condizioni reali iniziali
Vitesse d'impact / Impact speed / Velocità d'impatto + 1,8 % par rapport à la vitesse visée / from target speed / rispetto alla velocità mirata		: 101,8 km/h
Angle d'impact / Impact angle / Angolazione d'impatto 0° par rapport à l'angle visée / from target angle / rispetto all'angolo mirato		: 20,0°
Masse du véhicule / Vehicle mass / Massa del veicolo		: 884 kg
Résultats	Results	Risultati
Véhicule :	Vehicle :	Veicolo :
- Les valeurs de vitesse et d'angle sont comprises dans les limites de tolérances. - Le véhicule ne franchit pas le dispositif. - Le véhicule ne brise pas la barrière. - Le véhicule ne se renverse pas sur la zone d'essai. - Le véhicule reste dans les limites de la Boîte CEN. - Aucun élément du véhicule n'est détaché.	- Velocity and angle values were within tolerance limits. - The vehicle did not pass over the device. - The vehicle did not breach the barrier. - The vehicle did not roll over within the test area. - The vehicle did not leave the permitted CEN Box. - No part of the vehicle was detached.	- I valori di velocità e di angolazione rientrano nei limiti tollerati. - Il veicolo non supera il dispositivo. - Il veicolo non sfonda la barriera. - Il veicolo non si capovolge all'interno della zona di prova. - Il veicolo rientra nei limiti della CEN Box. - Nessun elemento del veicolo è staccato.
ASI : 1,0 THIV : 24 km/h (valeur limite/limit value/valore limite : ≤ 33 km/h) PHD : 16 g (valeur limite/limit value/valore limite : ≤ 20 g) Niveau de sévérité de choc / Severity level/Livello di severità : A Distance tête-obstacle / Flail space / Distanza testa-ostacolo : -0,3 m Durée du déplacement tête-obstacle / Time of flight / Tempo di volo : 102 ms Angle de sortie/Exit angle/Angolo di uscita : 6,6° Indice/index/indice VCDI : LS0000000		
Dispositif :	Device :	Dispositivo :
- Aucun élément de la glissière n'a été éjecté. - Aucun élément de la glissière n'a pénétré l'habitacle.	- No part of the barrier was ejected. - No part of the barrier penetrated the interior of the vehicle.	- Non si verificano espulsioni di elementi dal dispositivo. - Nessun elemento della barriera è penetrato nell'abitacolo.
Longueur de contact / Contact length / Lunghezza di contatto : 3,8 m Déflexion statique maximale / Maximal permanent deflection / Massima deflessione statica : 0,27 m Déflexion dynamique maximale / Maximal dynamic deflection / Massima deflessione dinamica : 0,3 m Largeur de fonctionnement / Working width / Larghezza di funzionamento : 0,8 m Niveau de fonctionnement / Level of working width / Livello di funzionamento : W2 ≤ 0,80 m		



IGQ

ISTITUTO ITALIANO DI
GARANZIA DELLA QUALITÀ

EC certificate of conformity 1608 CPD P070

In compliance with the Directive 89/106/EEC of the Council of the European Communities of 21 December 1988 on the approximation of laws, regulations and administrative provisions of the Member States relating to the construction products (Construction Products Directive - CPD), amended by the Directive 93/68/EEC of the Council of the European Communities of 22 July 1993, this is to state that the product:

Vehicle restraint system Gate system S-A-B

whose performance under impact is detailed in the attached annex

placed on the market by:

Snoline Spa

Via F. Baracca, 19/23 20056 Trezzo s/Adda MI - IT

and manufactured in the factory:

Trezzo d'Adda MI -IT; General Service Treviglio BG - IT

is submitted by the manufacturer to a factory production control system (FPC) and to the further testing of samples taken at the factory in accordance with a prescribed test plan and that the notified body IGQ has performed the initial type-testing for the relevant characteristics of the products, the initial inspection of the factory and of the factory production control and performs the continuous surveillance, assessment and approval of the factory production control.

This certificate attests that all provisions concerning the attestation of conformity and the performances described in Annex ZA of the standard:

EN 1317-5:2007

have been applied and that the products fulfill all the prescribed requirements.

first issue: **23/10/2008**

current issue: **09/11/2009**

Ing. Dario Agalbato
Director

This certificate remains valid as long as the conditions laid down in the harmonised technical specification in reference or the manufacturing conditions in the factory or the FPC itself are not significantly modified.



ISTITUTO ITALIANO DI
GARANZIA DELLA QUALITÀ

APPENDIX TO CERTIFICATE **1608 CPD P070**

Performance under impact of
**Gate system
S-A-B¹**

Product name	Type of test ²⁾	Performance level	Impact severity	Working width	Dinamic deflection
S-A-B 2, 3 elements ³⁾	TB11	H2	B	W2	0.3 m
	TB51	H2	---	W4	0,7 m
S-A-B 4, 5, 6 elements ³⁾	TB11	H2	A	W2	0.3 m
	TB51	H2	---	W6	1.3 m
S-A-B 7 ÷ 25 elements ³⁾	TB11	H2	A	W2	0.3 m
	TB51	H2	---	W6	1.6 m

1) The performance refers to the results of impact tests and of simulations based on impact testing.
2) According to ENV 1317-4:2001 (EN 1317-2:1998 + EN 1317-2/A1:2006).
3) Manufactured with components of non alloy steels or of improved atmospheric corrosion resistance steels.

first issue : **23/10/2008**
current issue: **12/04/2010**

Ing. Dario Agalbato
Director


SNOLINE s.p.a.

Via F. Baracca, 19/23 - 20056 Trezzo s/AdDa (MI) Italia
Tel. +39 02 90996.1 - Fax +39 02 90996.200
www.snoline.com - e-mail: info@snoline.com



Società soggetta a direzione e coordinamento da parte di Lindsay Corporation, Omaha, NE U.S.A.
Capitale sociale 3.000.000,00 € (i.v.)
C.F./P.IVA INTRA IT 00751770157 - Mecc. MI 010245
CCIAA Milano 466642 Tribunale Milano 93418 - V. 2564 - F. 1017



Subject: **EC Declaration of Conformity of the "S-A-B Gate Systems"**

SNOLINE SPA,
registered office and production in via F. Baracca, 19/23
20056, Trezzo sull'Adda (Mi), Italy,

issues this EC declaration of conformity to the harmonized standard EN 1317-5:2007.

With this document we declare to have obtained the certification from the body notified EC 1608:
IGQ "Istituto Italiano Garanzia della Qualità"
registered office in viale Sarca 336,
20126 Milano, Italy.

EC Conformity Certificate Nr. 1608 CPD P070 issued on the 23rd October 2008 related to "S-A-B gate systems", here attached.

Moreover we declare that the performances described in the Annex ZA of the EN 1317-5:2007 have been applied and that the products satisfies all the established requirements.

Dr. Ing. Marco Colombo
General Manager
Snoline S.p.a

