

# **DRAGNET<sup>®</sup>**

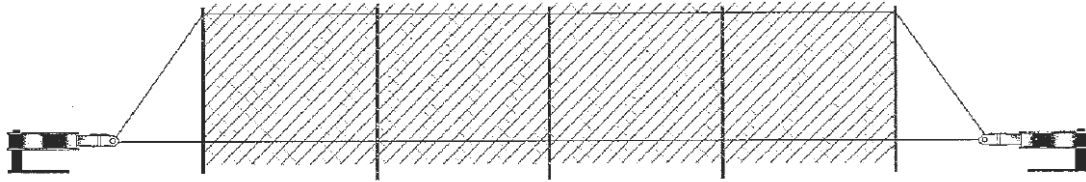
## **VEHICLE ARRESTING BARRIER**



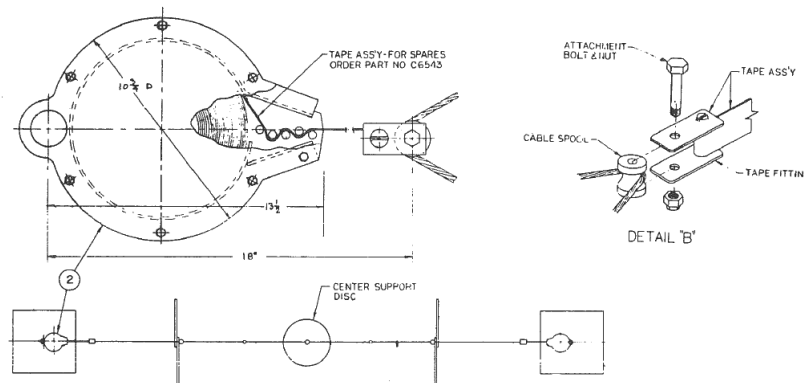
- ✧ *Fully Tested and Approved to NCHRP 350*
- ✧ *Occupant "G" Loads are Less than 5 "G"*
- ✧ *Protection Widths from 15 Feet to 100 Feet*

**CUSHION & BARRIER, LLC**

# The System



The **DRAGNET SYSTEM** is a net type attenuator. It provides a safe, controlled stop with minimum damage to the impacting vehicle, regardless of speed or vehicle size. The **DRAGNET SYSTEM**, with its ability to span any road width, is ideal for use in work zones, truck emergency run-off ramps, median openings, "T" intersections and other road closures. When mounted on towers, the **DRAGNET SYSTEM** offers the safest and most economical protection for RR crossings, reversible lanes, border crossings, and movable bridges. It provides positive protection allowing the establishment of a secure and yet forgiving perimeter.



**ENERGY ABSORBER**

The **DRAGNET SYSTEM, VEHICLE ARRESTING BARRIER**, (or "VAB") consists of a net with a continuous cable running through the top and bottom, both ends of which are attached to customized "energy absorbers." These energy absorbers contain a spool of coiled steel alloy tape. The tape is led through a series of offset steel pins contained in each energy absorber. As the net is hit, the metal tape is pulled through the pins, constantly bending and straightening the tape.

This metal deformation causes the smooth, safe deceleration of the vehicle. By changing the gauge of the metal tape and configuration of the pins, a barrier can be designed to handle any situation, from an 1,800 pound car to a 90,000 pound tractor trailer.

# Standard Units

The **DRAGNET SYSTEM's** energy absorbers are primarily rated by the amount of force needed to initiate pull on the tape. The secondary consideration is the length of tape provided. The following is a list of our standard units.

Rated Pull Out Force	Tape Length
4,500 pounds (20.017 Kn) .....	75 feet (22.86 M)
4,500 pounds (20.017 Kn) .....	200 feet (60.96 M)
18,000 pounds (80.068 Kn) .....	40 feet (12.19M)
25,000 pounds (111.21 Kn) .....	100 feet (30.48 M)

The following chart has been developed for a standard unit, designed for 4,500 foot pounds of restraint at each terminal with a 200 foot tape. Larger units, with up to 25,000 foot pounds of restraint, are also available. As a result, the **DRAGNET** can be designed to stop trucks and other heavy vehicles at high speeds with "G" forces well under NCHRP 350 guidelines. In fact all forces are under five "G" and are well under the "NCHRP 350 Preferred" values.

PERFORMANCE AND SAFETY CHARACTERISTICS		
USING FULL 200' FT. RUNOUT		
Vehicle Weight (Lbs.)	Maximum Velocity (MPH)	Maximum Average Acceleration (G's)
1,800 (816Kg)	172 (277 Kph)	5
4,500 (2041 Kg)	109 (175 Kph)	2
20,000 (9072 Kg)	52 (84 Kph)	0.45
40,000 (18,144 Kg)	37 (60 Kph)	0.23
80,000 (36,287 Kg)	26 (42 Kph)	0.11
<b>NO OCCUPANT INJURY OR VEHICLE DAMAGE</b>		

## DRAGNET PROVIDES FOR LOWER "G" FORCES

The **DRAGNET** has the lowest ride down "G" forces of any NCHRP 350 tested attenuator. The lower G forces greatly reduce damage not only to the impacting vehicle but also to its occupants. There has not been a serious injury related to the **DRAGNET** in over 20 years of use.

# Anchoring Details

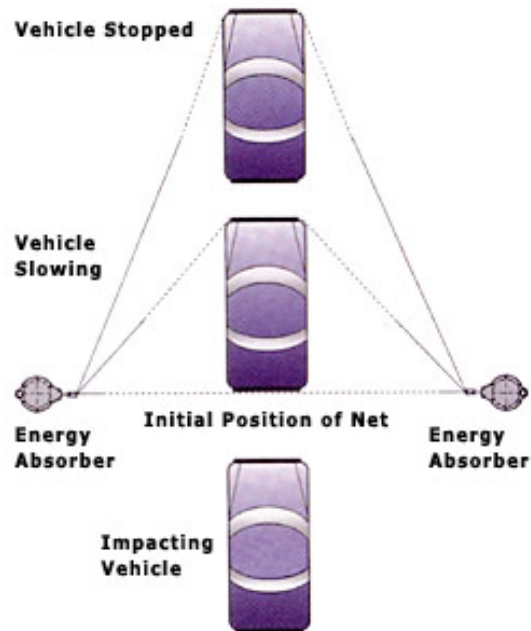
Cushion & Barrier, LLC has designed a comprehensive family of anchors for every application. Once a potential site has been identified, the appropriate anchors can be selected. Any combination of these anchors can be utilized at any site to meet your specific requirements. Simply select the application from the following list.

- **FOR CONCRETE ROADWAYS:** This system is best suited for night paving and other types of construction zone road closure, where the net must be set up and taken down repeatedly. A concrete footing with a drop-in socket and post system are placed on each shoulder to accommodate the energy absorbers.
- **FOR CONCRETE BARRIER WALLS – INTERNAL MOUNT** – Designed to be used with modified temporary concrete barrier in work zone situations. The energy absorber is anchored within the barrier wall, providing positive protection.
- **FOR CONCRETE BARRIER WALLS – EXTERNAL MOUNT** – This anchoring system attaches to existing concrete barrier at sites that require road closure. These anchors can be adapted to any concrete barrier profile.
- **SURFACE MOUNT ADAPTER FOR CONCRETE SLABS:** This anchor was designed to be bolted to concrete pavement surfaces. It can be removed and relocated easily to meet your changing needs.
- **HITCH TO EXISTING OBJECTS:** This anchor features a cable loop and clevis attachment and can be adapted for use with trees, trailer hitches, or any other solid structures. It can also be used with earth/dirt anchors, allowing a wide variety of anchor locations.
- **LOW PROFILE ANCHORS:** This design is utilized in construction zones to close all lanes. The low profile anchor was designed to be less than 6” high and can withstand vehicle “run-overs” with no consequences.

# The Energy Absorbers

The absorbers are designed so that a specific force is required to initiate pull on the tape. As the tape is pulled through the staggered pins, the force created remains constant throughout the deceleration providing the gentlest arresting system available. The energy absorbers require minimal anchoring.

The absorbers can be quickly and easily attached to concrete pavement, barrier walls, sign trusses, trees, stationary vehicles, or other suitable restraints.



The standard **DRAGNET** energy absorber provides a constant pullout force of 4,500 pounds and contains 75 feet of tape. With one absorber on each end of the net, a standard installation has the capacity to provide 675,000 foot pounds of resistance, which is more than enough to handle a passenger vehicle impacting at 75 MPH.

# Advantages

- ✓ The Dragnet can be installed and removed in minutes.
- ✓ The Dragnet is designed for 1,800 lb. cars as well as 90,000 lb. trucks.
- ✓ The Dragnet can be adapted to any road width required.
- ✓ The Dragnet can safely and easily handle angle hits.
- ✓ The Dragnet can be restored quickly and easily following impact.
- ✓ The Dragnet offers extremely low cost-per-hit.
- ✓ The Dragnet is NCHRP 350 approved for all highway applications.

# Applications

## **FOR CONSTRUCTION ZONE “TOTAL PROTECTION”**

When used at the front of construction work zones, the VAB provides positive and yet forgiving protection. The system is portable and can be moved as the job changes or progresses.

## **FOR MULTI-LANE TRAFFIC CLOSURES AND ON/OFF RAMPS**

Can close all lanes.  
Can be erected and taken down in minutes.

## **FOR EMERGENCY TRUCK RUN-OFFS**

Requires shorter distance than gravel bed arrestors (as low as 330 feet).  
Not susceptible to weather influence; requires little maintenance.

## **FOR MEDIAN TRAPS**

Can be applied to any width roadway. Will adapt to most median contours.

## **FOR MOVABLE BRIDGES AND RAILROAD CROSSINGS**

Can be raised and lowered as required.  
Can be free standing or adapted to existing structures.

## **FOR EMERGENCY ROAD CLOSING**

Can be set up in and dismantled in minutes.  
Anchors can be set in earth, tied to trees or fit over trailer hitches.

## **FOR “T” INTERSECTIONS**

Can span up to 100 feet with one set of absorbers.  
Can provide permanent positive protection.

# Special Applications

## EMERGENCY TRUCK RUN-OFF RAMPS



By using a series of nets, the **DRAGNET** can withstand the impact of a 90,000 pound tractor trailer at speeds of up to 90 mph. Damage to the vehicle is minimized and the possibility of load shifting and jack knifing is significantly reduced. In most cases, removal of the vehicle can be achieved by simply backing the truck out of the nets.

The **DRAGNET** is the ideal solution for the problems encountered with gravel bed arresting systems. It is not affected by environmental conditions, such as freezing or contamination. The **DRAGNET** is designed for maintenance free operation and only periodic inspections are required.

## DROP SYSTEMS

Due to the unique design of the **DRAGNET**, a deployment system has been developed to vertically drop the **DRAGNET** into an active position. This is achieved by means of a simple structure that raises and lowers the net on command.

A drop system is ideal for road closures at movable bridges, railroad crossings, reversible commuter lanes or any situation requiring a full and positive closure. Cushion & Barrier, LLC engineers will provide drawings on request.



## LANE CLOSURES



The **DRAGNET VEHICLE ARRESTING BARRIER** can be utilized for all multiple lane closures at construction zone sites. A low profile anchor has been developed to meet the FHWA criteria for obstacles on our highways. This allows the **DRAGNET** to be used to close all lanes of a multiple lane highway. This system offers a degree of safety previously not available from truck mounted attenuators.

# History

The **DRAGNET VEHICLE ARRESTING BARRIER** is patented and manufactured by Cushion & Barrier, LLC. The system is based on the principle used to arrest aircraft on aircraft carriers.

Comprehensive testing and in-service evaluation of the **DRAGNET SYSTEM** has led to it's application on many of our nation's roads, streets and highways. The **DRAGNET** is fully tested and approved to NCHRP 350 and is currently approved in most American States and in many other Countries.

The past few years have seen an increase in the need for positive construction zone protection. Movable bridge openings, median openings, full road or ramp closure, at grade rail crossings, border crossings, tunnel openings, bridge security and truck escape ramps are all applications for the **DRAGNET®**.

The **DRAGNET SYSTEM** provides the safest and most forgiving deceleration of any system available.

## CUSHION & BARRIER

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