Yamamoto Ultra Large Rock Splitter

HRB-1000
HRB-1700
YTB-1120

YAMAMOTO

Yamamoto Ultra Large Rock Splitter

The most efficient and safest way to excavate hard rock!

Why use Yamamoto Ultra Large Rock Splitter?

Explosives and large rock breakers are the common methods for excavation of hard rock. However, restrictions on blasting are increasingly strict and the use of rock breakers is not always feasible due to vibrations, noise restriction or because the rock is too hard. Yamamoto Ultra Large Rock Splitter is the best alternative to efficiently excavate large volumes of hard rock without blasting.

The splitter can be mounted from a crane or a normal excavator for open pits and shafts, or mounted on a customised carrier for horizontal tunnelling.

For large volume rock excavation, there is simply no mechanical method more efficient, safe and quiet than Yamamoto Ultra Large Rock Splitter.

Yamamoto Ultra Large Rock Splitter has been used worldwide in some of the most challenging and important construction and infrastructure projects such as Guangzhou-Hong Kong Express Rail Link in Hong Kong, Ipoh-Padang Besar Electrified Railway Project in Malaysia, West Condominium, New York, USA, Ottawa Main Rehabilitation in Canada, Bangalore Metro Railway Project in India, Akaiwa Tunnel in Japan, Project Tornet in Sweden and many more.

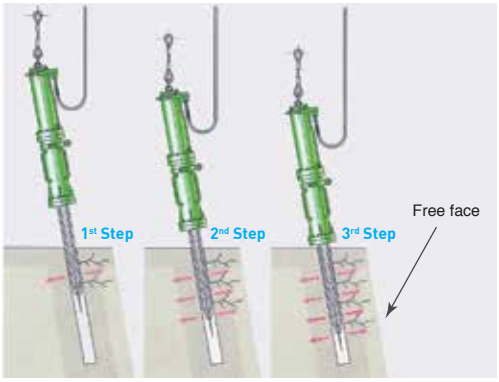
Features of Yamamoto Ultra Large Rock Splitter

Yamamoto Ultra Large Rock Splitter has been developed and refined over the past 30 years to provide superior quality and maximum output. Key features include:

- **SAFETY:** Rock splitting is done without any explosives, pollution or noise, reducing the risk of fly rock.
- **PRODUCTIVITY:** Offers highest possible productivity due to large wedge diameter and very high splitting force.
- **DURABILITY:** Designed with minimal parts and provides precise finishing, ensuring product reliability and durability.
- **ACCURACY:** Direction of splitting and the size of the split can be determined in advanced. Offers more accuracy than explosives.
- **EFFICIENCY:** Due to the absence of fly rock or any other dangers, the splitting process can be done continuously without any evacuations or unnecessary pause.
- **SIMPLE:** Very simple and easy to use; minimises the need for highly experienced operators.
- **ADAPTABILITY:** Can be attached to almost any kind of hydraulic excavator from 12 ton weight class and up.

How does Yamamoto Rock Splitter work?

The working principle of Yamamoto rock splitter is based on two counter wedges inserted in a pre-drilled hole. A hydraulic cylinder pushes out a centre wedge between the counter wedges to spread them apart and the rock is forced to crack.



To maximise the splitter's effectiveness, the 3-step approach below is highly recommended:

1st Step: Insert half of the total length of wedge and operate the Yamamoto splitter to split.

2nd Step: Then insert about ¾ of the total length of the wedge to split again.

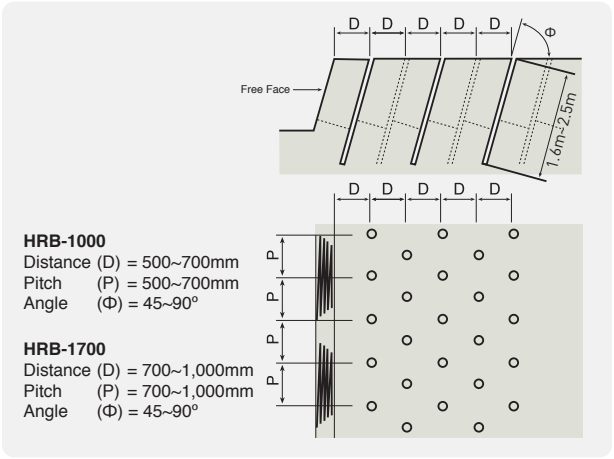
3rd Step: Finally, insert the total length of the wedge and split to complete.

HRR-1000 HRR-1700 YTR-1120

Work process - Vertical applications

1. Drilling

Drill the holes of Ø100 mm X 1.6 m depth for Yamamoto HRB-1000 splitter, or Ø125 mm X 2.5 m depth for HRB-1700 splitter using a large size hydraulic crawler drill or jumbo drill rig. We recommend drilling in a staggered pattern with 500 - 700 mm of spacing between holes for the HRB-1000 and 700 - 1000 mm for the HRB-1700, as illustrated in the diagram.



HRB-1000
Distance (D) = 500~700mm
Pitch (P) = 500~700mm
Angle (Φ) = 45~90°

HRB-1700
Distance (D) = 700~1,000mm
Pitch (P) = 700~1,000mm
Angle (Φ) = 45~90°

2. Splitting

Insert the wedge into the hole and split the rock. Position the wedge so that it is splitting towards the free face. To maximise the splitter's productivity, it is very important that the splitter is splitting towards a free face.

3. Secondary breaking

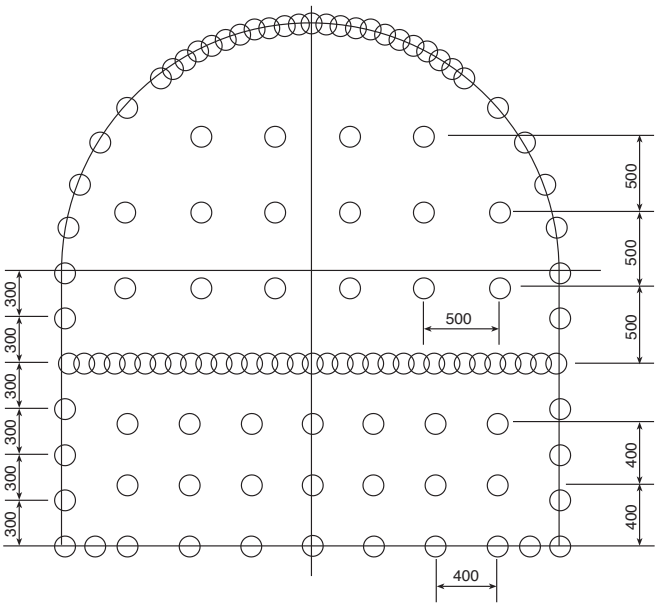
Break the already split rock into smaller pieces and remove it with a conventional excavator with a rock breaker. Removing the broken rock will keep the free face close to where the splitter is working. Secondary breaking and splitting can be conducted simultaneously.

4. Mucking

Remove the muck using a hydraulic excavator, wheel loader or similar machine.

1. Drilling

Create a free face by drilling slots in the centre, bottom or periphery. Then drill split holes for the Yamamoto Splitter between the slots. Proper slot drilling involves drilling overlapping holes as bridges between the to holes to allow the rock to maintain its structural integrity. A special attachment on the jumbo boom may be required for slot drilling. The photo and drawing below exemplify some recommended drilling patterns.



2. Splitting

Use a splitter mounted on a customised carrier equipped with telescopic boom and rotator. Start splitting the holes closest to the free face and aim at working from the bottom and up to allow support from gravity. Split in three steps by first inserting half of the total length of the wedge and split, then ¾ of the total length and split and finally the full length of the splitter.

3. Secondary breaking

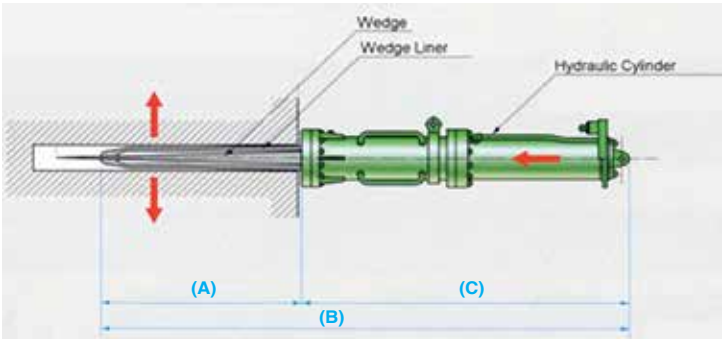
Break out the cracked rock into smaller pieces using a hydraulic breaker mounted on a conventional excavator. Work along the cracks caused by the Yamamoto Splitter.

4. Mucking

Use a mucking method that suits each project, typically done with a standard excavator.

Technical specifications

Model	HRB-1000	HRB-1700
Weight	650 kg	1,500 kg
Drill hole diameter	Ø100 mm	Ø125 mm
Drill hole depth	1,600 mm	2,500 mm
Splitting force	22 MN (2,250 ton)	34 MN (3,500 ton)
Splitting distance	25 mm	30 mm
Wedge diameter	Ø95 mm to 110 mm	Ø120 mm to 160 mm
Wedge length (A)	1,150 mm	1,850 mm
Splitter length (B)	3,000 mm	4,300 mm
Cylinder length (C)	1,850 mm	2,450 mm
Hydraulic pressure (min/max)	320/500 bar	320/500 bar
Split hole spacing	500-700mm	700-1,000mm



YTB-1120:
Total solution for horizontal application

YTB-1120 seamlessly integrates HRB-1000 with customised Hitachi EX120 that includes shorter arm, telescopic boom, side-angling, rotator and extra hydraulic function. The telescopic boom makes it easier to insert wedge set into splitting hole horizontally, while the rotator enables control of splitting direction.

The history of Yamamoto Rock Splitter started back in 1915 when the late Mr. Shuichi Yamamoto first started manufacturing of rock drill spare parts in the mountain village of Tojo in central Japan. Over the years manufacturing expanded into rock drills, pneumatic drifters and hydraulic drifters. The drifters were supplied on contract basis to reputed rock drill manufacturers such as Atlas Copco and Ingersoll Rand.

The first Yamamoto Ultra Large Rock Splitter was supplied in 1981. Since then, we have supplied over 200 splitters worldwide. In 2010, the international marketing or Yamamoto Rock Splitter was shifted to Singapore for easy stocking delivery of splitter and spare parts.

All manufacturing and product development still takes place in the original factory in Tojo, Japan. This allows us to keep strict control over quality and to build on the 100 years of experience.

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