

**REMCO OPERATORS COUNCIL NEWSLETTER** 

## **Two Projects, One Crusher, Saves Money** Modular crusher design allows for fast, inexpensive field retrofit

In early 2013, a large national aggregate producer needed the ability to produce minus 5/8" chips and a lot of asphalt sand. They turned to REMco's Central Regional Manager, Mike Howell for assistance. At his recommendation, they applied an autogenous REMco VSI crusher to meet the application guidelines.

#### **Original Application**

Rock Type:	Granite
Feed Size:	3" x 5/8"
Product Size:	5/8" chips and asphalt sand
Production Rate:	375 finished product tonnage
Chamber:	Autogenous
Rotor/Impeller:	32-4-14 rotor
REMco Model:	REMco Series 5080
HP:	2 x 300 HP

#### Conversion

Nearing the completion of the granite crushing application, the customer asked REMco if the machine could be used to crush limestone because they were having trouble meeting production demand at another facility. REMco said yes, the machine could crush limestone in its current configuration however, limestone is much less abrasive than granite and the customer might benefit from converting the crusher from autogenous to semi-autogenous mode of operation for best overall performance.

Application details for the limestone crushing job were similar to the granite crushing project. Estimated top size of feed 3" with some oversize up to about 4" and finished product to be minus ½" chips and sand. REMco's suggestion based on the application was to convert the crusher to a semi-autogenous configuration since it was the easiest and most cost effective method. The crusher was moved to the new location and field converted to a semi-autogenous mode of operation with a 32-4-14 IronSide autogenous rotor and anvil crushing chamber.



**Figure 1:** Shows the sequence of converting the REMco Series 5080 from a rock-on-rock and rotor configuration (top) to IronSide rotor and anvil chamber (middle) and finally the shoe-table anvil configuration (bottom).



REMco's modular crusher component design allows for easy change out of the autogenous crushing chamber and changing the rotor is accomplished by a quick disconnect taper lock. Under the supervision of a REMco Service Technician, the conversion was completed in one day.

Once the crusher was put in service, new challenges quickly emerged in the form of bridging at the feed tube, nuisance vibration shutdowns, and clogged rotor ports from oversize feed. Due to the material flow configuration of the plant, feed to the REMco VSI crusher was unprotected; there was no screen sizing the rock feed ahead of the VSI. Instead, the preceding crusher setting determined the size and shape of material going to the VSI.

Unfortunately, under certain conditions, the preceding crusher could discharge a percentage of elongated feed that was 5" long which is referred to as "rogue oversize". This material has such a name because by all that is right (c.s.s. of the preceding crusher, etc.), it is not supposed to be there, but there it was could bridge part of the feed tube or completely bridge the feed tube if elongated particle landed crossways at the same time.

In the event large, elongated particles did go down the feed tube it was difficult for them to pass through the ports of the enclosed autogenous rotor. Worse, when the long particles did manage to land in the rotor just right and pass through they would break rotor components. This was a difficult situation at best. It was unrealistic to add a screen to the circuit (there was no time nor money) and adjusting the C.S.S. on the preceding crusher to ensure elimination of rogue elongated particles would reduce overall plant production.

The modular design of the REMco allowed further modification of the crusher to accept the feed "as is" without modification of the crushing circuit. Larger feeds typically require less speed to crush due to their mass. The original 1,800 rpm electric motors were changed to 1,200 rpm motors. Also changed was the V-belt drive to reduce the crusher shaft speed to 900 rpms. REMco's recommendation was to change the 32-4-14 IronSide rotor to a 42" 4 shoe table and replace the feed tube from 13" to 18" to allow acceptance of rogue feed material.

With the machine converted to full hard parts (see REMco ST/AR catalog for more info) the crusher was restarted. The performance was as expected, no clogs or vibration shut-downs and 450 tph throughput with 150 tph of minus  $\frac{1}{2}$ " x 0 products out to stockpiles.

After about a year of operation, the customer is very satisfied with his decision to convert an underutilized asset to do the required crushing work instead of buying a new crusher.

#### **Conversion Statistics**

Price of conversion components	\$83,450	
VS.		
Price of New 5080 ST/AR (crusher only)	\$ 246,000	

For this and many other reasons is why REMco's slogan is: *The rock never wins, you do.* If you would like additional information on REMco crushers please contact your area represenatives below:



# TECH TALK

### Service and Maintenance tips for REM<sub>co</sub> crusher operators Rotor Series: Selecting the right REMco rotor

## **A Technical Explanation**

The design and type of rotor used is the major factor for success in the application of your VSI crusher due to the variation of feed size, feed rate and type of rock characteristics.

REMco VSI crushers use the broadest range of rotor configurations to provide the maximum application flexibility. When selecting the right rotor for your machine, consider the rock type, feed size, and finished product. Rotors are influenced by the work they are intended to do and the rock that is being crushed. There are coarse crushing rotors, fine crushing rotors, and general-purpose rotors, selecting the right rotor is dependent on the desired product specification. REMco crushers can be supplied with 3-port, 4-port, 5-port and 6-port rotors in multiple diameters and heights depending on the details of the crusher's application.

The REMco multi-port design incorporates a radialtype wall geometry to maximize the flow rate through the rotor while processing feed sizes up to 4" (100 mm) depending on model. REMco's multiport rotors can also be selected to reduce production of undesirable microfines and to provide the lowest horsepower per feed ton rating in a VSI crusher, while at the same time, making desired products.

REMco multi-port rotors in 4, 5 and 6-port designs provide a higher pulse rate per revolutions per minute for greater impact crushing and increased chamber density. This makes for more efficient rockon-rock crushing and lower cost per ton of product. The greater number of ports in a rotor, the lower the tons per hour that pass through each port. This extends wear parts and tungsten tip life providing for a longer wearable life.

REMco multi-port rotors provide the modern VSI crusher operator with improved performance and operating benefits.

- REMco's multi-port rotor power demand is 1.0 to 1.5 horsepower per ton of feed, wherein a traditional 3-port rotor power demand is 1.6 to 2.5 horsepower per ton of feed.
- Multi-port rotors charge the rock-on-rock chamber with a greater density of high velocity stone, improving crushing efficiency.
- Multi-port rotors can more easily pass occasional oversize and elongated pieces in the feed stream to the crusher. This reduces or eliminates crusher shut down due to blockage of a rotor port.
- The open sided design of REMco multi-port rotors and their wear parts make for easy wear part changes.

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SERIES MODEL	310	320 / 1025	1530	4060	5080	9150	
DRIVE MOTOR ARRANGEMENT	Single	Single	Single	Single	Dual	Dual	
HP RANGE	30 - 125	100 - 250	150 - 350	350 - 600	600 - 800	900 - 1,500	
ROTORS: NUMBER of PORTS	3/4	3 /4	3/4/5	3/4/5	3/4/5/6	3/4/5/6	
ROTOR DIAMETERS	18" / 23"	23"/ 25"	30" / 32"	30"/ 32"	32"/ 37"	32" / 37"	
			35″	37" / 42"	39"/ 42"	39"/ 42"	
MAX. CRUSHING VELOCITY	305 FPS	305 FPS	315 FPS	315 FPS	315 FPS	300 FPS	
ROCK TYPE CHAMBER	Fine /Coarse	Fine/Coarse	Fine/Coarse	Fine/Coarse	Fine/Coarse	Fine/Coarse	
NUMBER OF ANVILS – ST/AR MODEL	15	16	17 / 18	18 / 20	19 / 21	19 / 21	
ACCEPTABLE MAX. FEED SIZE	1.5"/ 40 mm	2.0"/ 50 mm	3"/ 75 mm	3"/ 75 mm	4"/ 100 mm	4"/ 100 mm	

Our next tech tip will continue the three part series on all things rotor - selection, tuning, and balancing.

**Figure 1:** REMco builds 21 different rotors from 18" to 42" in 3, 4, 5 or 6 ports and are available in various REMco Series Models.





**Proman Infrastructure** has been REMco's local exclusive authorized licensee for *VSI* products in India since 2001 and is the standard bearer for VSI excellence in the region.

Join REMco in supporting Proman as they will be exhibiting at *EXCON* 2017 on December 12 - 16, 2017 in Bengaluru, India. This is the 9th International Construction Equipment and Construction Technology Trade Fair in Asia with over 500 local and international exhibitors and over 30,000 visitors.

Proman, along with REMco representatives will exhibit the full product range from the VSI, PROcone, PROscreen, PROjaw to name a few.

Phanksgiving Special

save 10%

on your November part orders\* 11/15/17 - 12/15/17

Stock up on your REMco parts and save!

November is the month for giving thanks, and REMco would like to say "thank you" for your business throughout the year.

A 10 % discount offered on parts orders of \*\$3,500 or more placed 11/15/17 -12/15/17.

Contact your REMco Team member and place your order today! Toll Free (800) 782-2411 with promocode #givethanks

> Dealer participation required on all orders placed through a REMco authorized distributor, 10% Thanksgiving special applicable to end users only and cannot be combined with any other offer.

This newsletter is produced for REMco users and its intent is to make your life easier! We want to hear what has been happening with the REMco crusher in your plant. Send us your questions, comments and job stories today!

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