

# Auto-Balance Impact Crusher

US Patent Nos. 5,863,006 & 6,032,689



*THE  
Rock-On-Rock  
Crusher*



**Texas Crusher Systems, Inc.**

# Model 2014 Features

## Welded Steel Mainframe

Made from 1/2" Steel, Solid Belt Tunnel Welded to Shell for maximum strength and rigidity.

## Rotor Construction and Balance

40 " OD closed Rotor with Four Ports, Welded 400 Brinell Steel Structural Shell with Key Areas Protected by Replaceable Bolt-On Parts, Automatic Balancing Ring attached to Rotor rebalances each revolution offsetting 50 to 60 pounds of uneven material pack.

## Rock Packed Crushing Chamber

Crushing Chamber consists of a top and bottom rock shelf with anvils. Material packs between the two shelves forming a rock pack to crush against.

## Tungsten Carbide Wear Parts

Primary Wear Parts are solid tungsten carbide mounted in hard steel brackets.

## Crusher to Conveyor Discharge Box

## Two-Piece Bearing Drive

Dual bearings in top section. Oversized bearing in bottom section. Shaft is 5-3/8" to 6". Lithium base grease lubrication.

## Rock Pack Protects Steel

Rock packs protect the sides and form exit chute. Lid placement eliminates need for Lid liners.

## Hydraulic Belt Tension Adjustment

8V Belts and Sheaves with Hydraulic Tension Adjustment.

## Telescoping Legs Standard

Adjust 4', 5' or 6' from the ground.

## Top and Bottom Inspection Hatches

## Free Wheel Distribution Plate

## Stairs

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## Operating Parameters

**200 to 600 HP, Single or Dual Electric Motors, Portable with Diesel Power**

**Rotor Speed Range - 875RPM (9,160FPM) to 1,350RPM (14,130FPM)**

**Maximum Feed Size - 2" at 1350RPM on Rotor; 2-1/2" for Rotor speed 1,200RPM or less**

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## Operating Performance

Wear-Parts Cost - **\$0.01** (low abrasion materials - 30% or less silica) to **\$0.20** (high abrasion materials - 80%+ silica) per ton throughput.

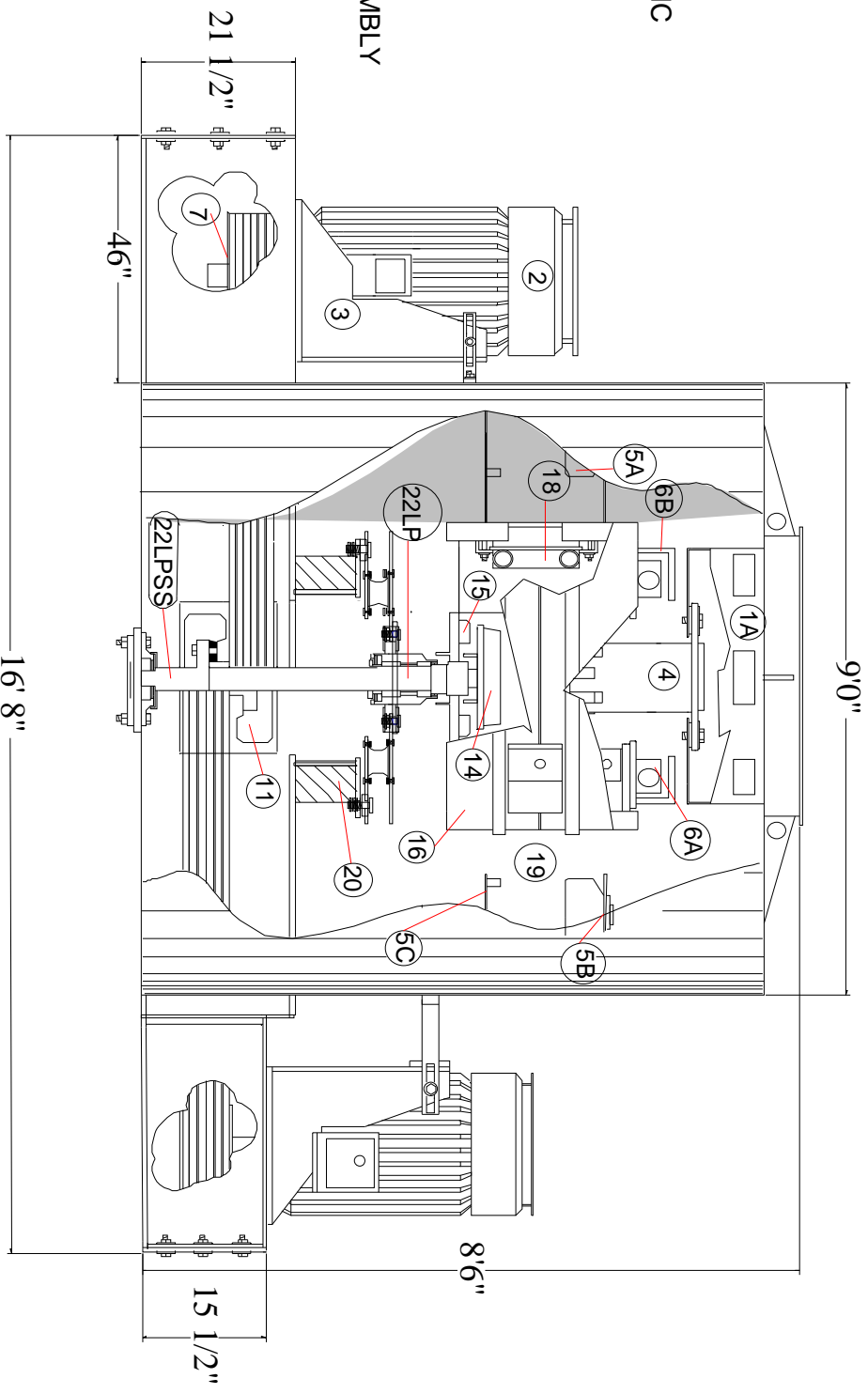
**600 to 2000 hours** between Wear Part Changes

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# TEXAS CRUSHER SYSTEMS, INC. ABI CRUSHER

U.S. PATENT 5,863,006 & 6,032,889

- 1A FEED BASKET
- 2 MOTOR
- 3 MOTOR MOUNT
- 4 FEED TUBE
- 5A ANVILS
- 5B UPPER ROCK SHELF
- 5C LOWER ROCK SHELF
- 6A BALANCER
- 6B BALANCER COVER
- 7 OUTER PULLEYS & HUBS
- 8 BELTS
- 9 BELT TENSION ADJ. HYDRAULIC
- 10 CHUTE W/LINER
- 11 CENTER PULEY & HUB
- 12 GREASE HOSES
- 14 DISTRIBUTION PLATE
- 15 BOLT PROTECTOR
- 16 ROTOR
- 18 CARBIDE PIN ASSEMBLY
- 19 VANE PROTECTOR
- 20 BEARING ASSEMBLY STAND
- 22 LOW PROFILE BEARING ASSEMBLY



## Design History

Vertical Shaft Impact(VSI) Crushers have been used by aggregate producers and mining companies for 40+ years and have been marketed as low wear–part cost and low downtime. This may be true in low abrasion materials. In highly abrasive materials, Impact crushers have not lived up to the promise of low cost and downtime.

The designer of the Auto–Balance Impact Crusher discovered this the hard way – he leased a 75HP Crusher to crush river rock with 50 to 60% abrasives.

**30 days, 8000 tons and \$8,000.00 worth of wear parts later, he decided there has to be a better way.**

Design of the Auto–Balance Impact Crusher began shortly thereafter.

**THE GOAL: PROTECT AS MANY METAL PARTS AS POSSIBLE WITH MATERIAL PACKS**

The biggest problem encountered was keeping the rotor in balance. (Most VSI crushers use various types of metal partitions to force the material to flow through the rotor evenly and the wear parts cannot wear unevenly or the crusher vibrates severely.)

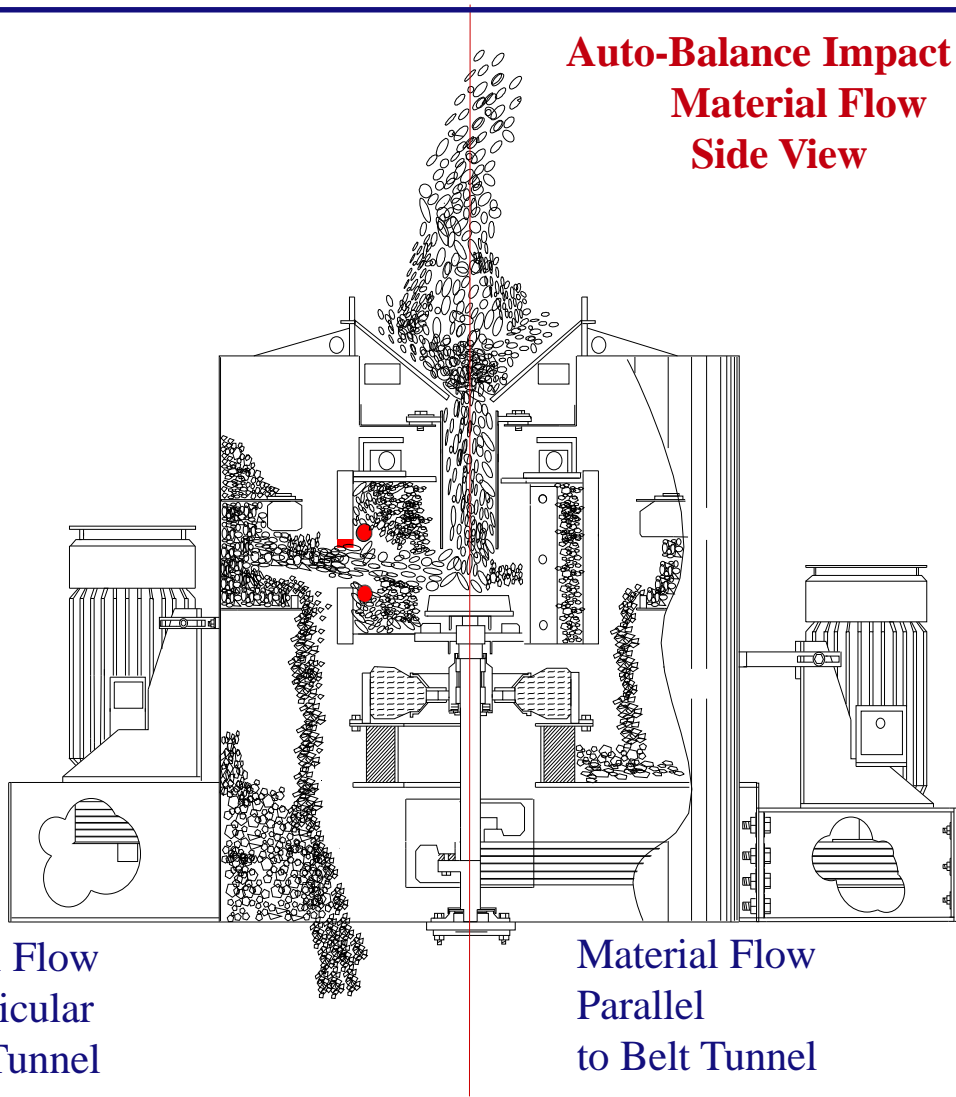
After testing many different alternatives, the Auto–Balance feature was developed. Once this occurred, use of material packs inside the rotor became possible. This eliminated the metal partitions and minimized the number of areas on the rotor that wear.

The auto–balance and other items are patented features of the Auto–Balance Impact(ABI) Crusher. The use of material packs to protect metal parts has been extended to the sides, bottom and exit chutes. The top of the Crusher does not experience wear because it is high enough to avoid the rock.

## Design Features

- \*Closed Rotor With Four (4) Ports**
- \*Auto–Balancer On Rotor Offsets 50 to 60 Pounds Rock Pack Imbalance**
- \*Ports Lined With Solid Tungsten Carbide Wear Parts**
- \*Width of Stream From Rotor Ports Is Narrowed To Maximize Impact Of Individual Rocks In Crushing Chamber**
- \*Use Of Socket Head Screws Minimized To Make Maintenance Easier  
Goal: Every Bolt Positioned So Impact Wrench Can Be Used**
- \*Distribution Plate Free Wheels – Turns Slower Than Rotor**
- \*One Basic Machine – Operates From 200HP to 600HP**
- \*Hydraulic Belt Tension Adjustment – All Bolts Outside To Minimize Time Required to Tension Belts**
- \*Telscoping Legs – Adjustable To 4, 5 or 6 Feet From The Ground.  
No Platform or Chassis Required.**
- \*Crusher–To–Conveyor Discharge Box With Door To Access Inside of the Crusher from the Bottom**
- \*Top Inspection Hatch With Hinged Cover**
- \*Sides and Bottom Of Crusher Protected With Material Packs – No Lid, Side or Chute Liners Required**
- \*40 inch ID Feed Hopper**
- \*Slanted Stairway Rather Than Vertical Steps**
- \*Shoe Table Available for less abrasive materials – Input size 4 inches**

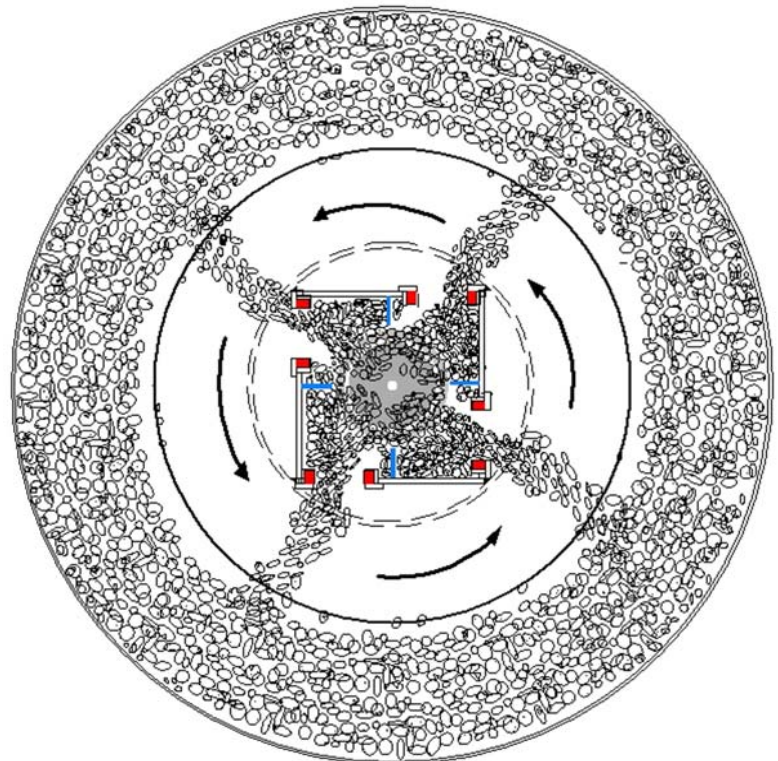
**Auto-Balance Impact Crusher  
Material Flow  
Side View**



Material Flow  
Perpendicular  
to Belt Tunnel

Material Flow  
Parallel  
to Belt Tunnel

**Auto-Balance Impact Crusher  
Material Flow  
Top View**



- Wear Parts
- Vanes



**Rock-Packed Rotor/Balancer Assembly Port Holes are protected on three sides with tungsten carbide wear parts.**

**Rock-Packed Crushing Chamber Anvils used in the top rock shelf and vertical flange in the bottom rock shelf insure a solid material pack**



**Anvils after several months of operation**

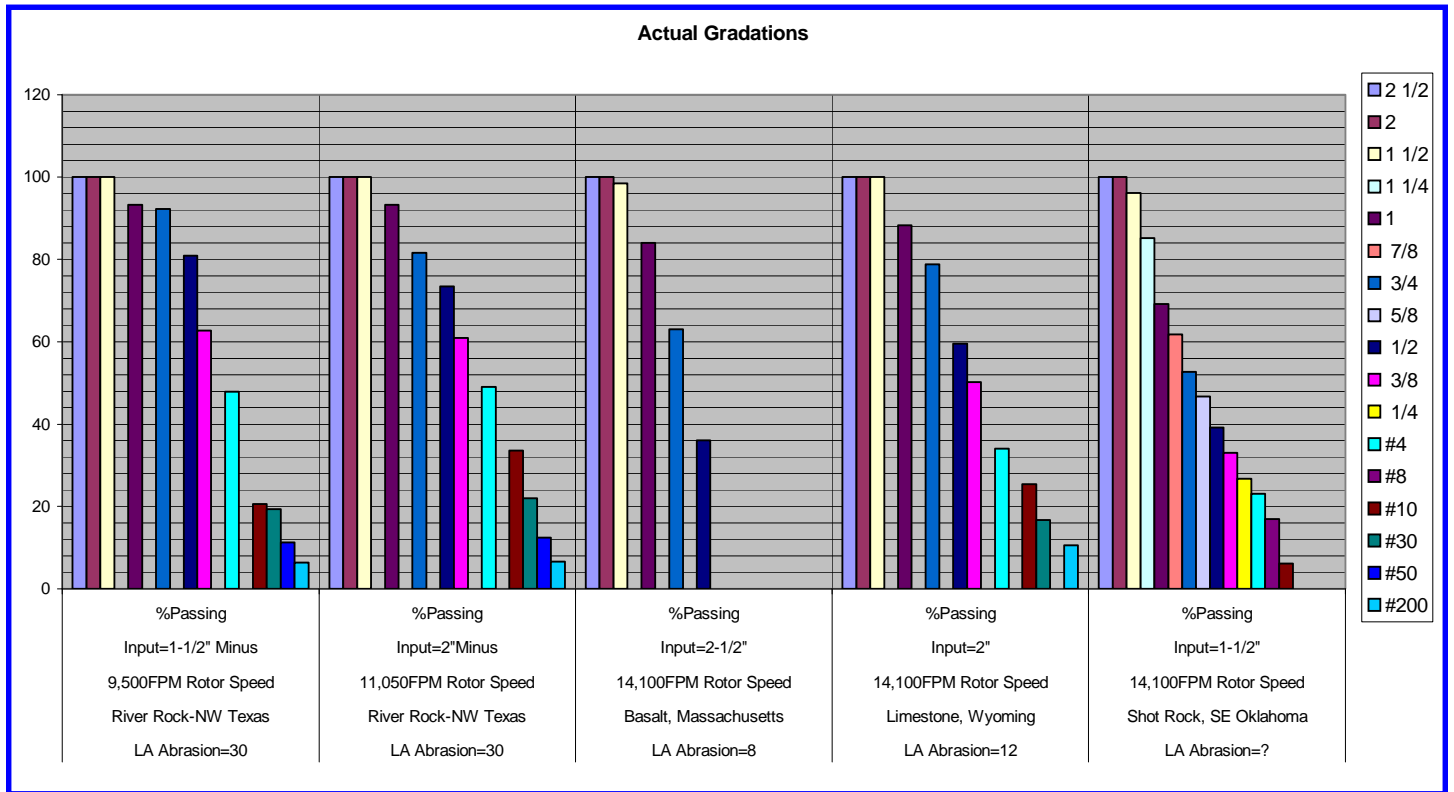
**Throughput Capacity  
Single Pass, Open Circuit**

MODEL						
Drive Power	200	250	300	400	500	600
200 HP	160-200					
250 HP		200-250				
300 HP			240-300			
400 HP				320-400		
500 HP					400-500	
600 HP						480-600

**Output Capacity  
Closed Circuit**

MODEL						
Feed Size - 2-1/2" Minus						
Model/HP	200	250	300	400	500	600
Output Size	Tons Per Hour					
1"	134-186	168-233	202-280	269-298	353-466	403-559
3/4"	126-184	158-231	151-277	252-369	315-461	378-553
1/2"	95-162	119-220	143-242	190-323	238-404	286-485
3/8"	80-125	100-157	120-188	160-251	200-314	240-376
#4	54-96	68-123	82-147	109-196	136-245	164-294
#10	21-67	41-84	61-101	81-134	102-168	122-202
#30	27-44	33-55	40-66	53-88	67-110	80-132
#50	18-25	22-31	22-37	30-50	38-62	46-74
#200-	6-10	8-14	10-21	12-25	16-27	20-33





**Open Circuit:**

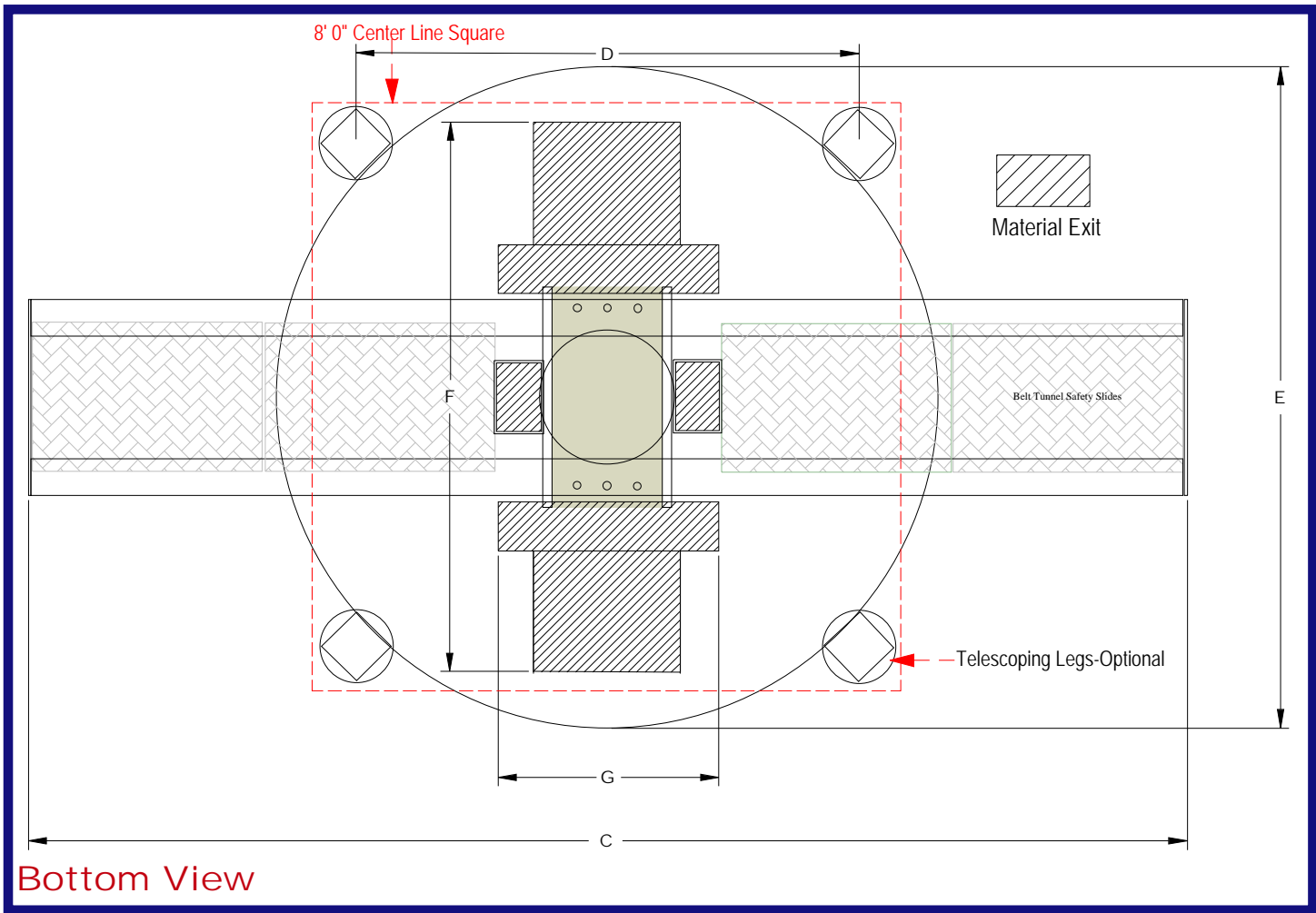
Throughput Range Varies With Rotor Speed  
Higher Rotor Speed = Lower Throughput

**Closed Circuit:**

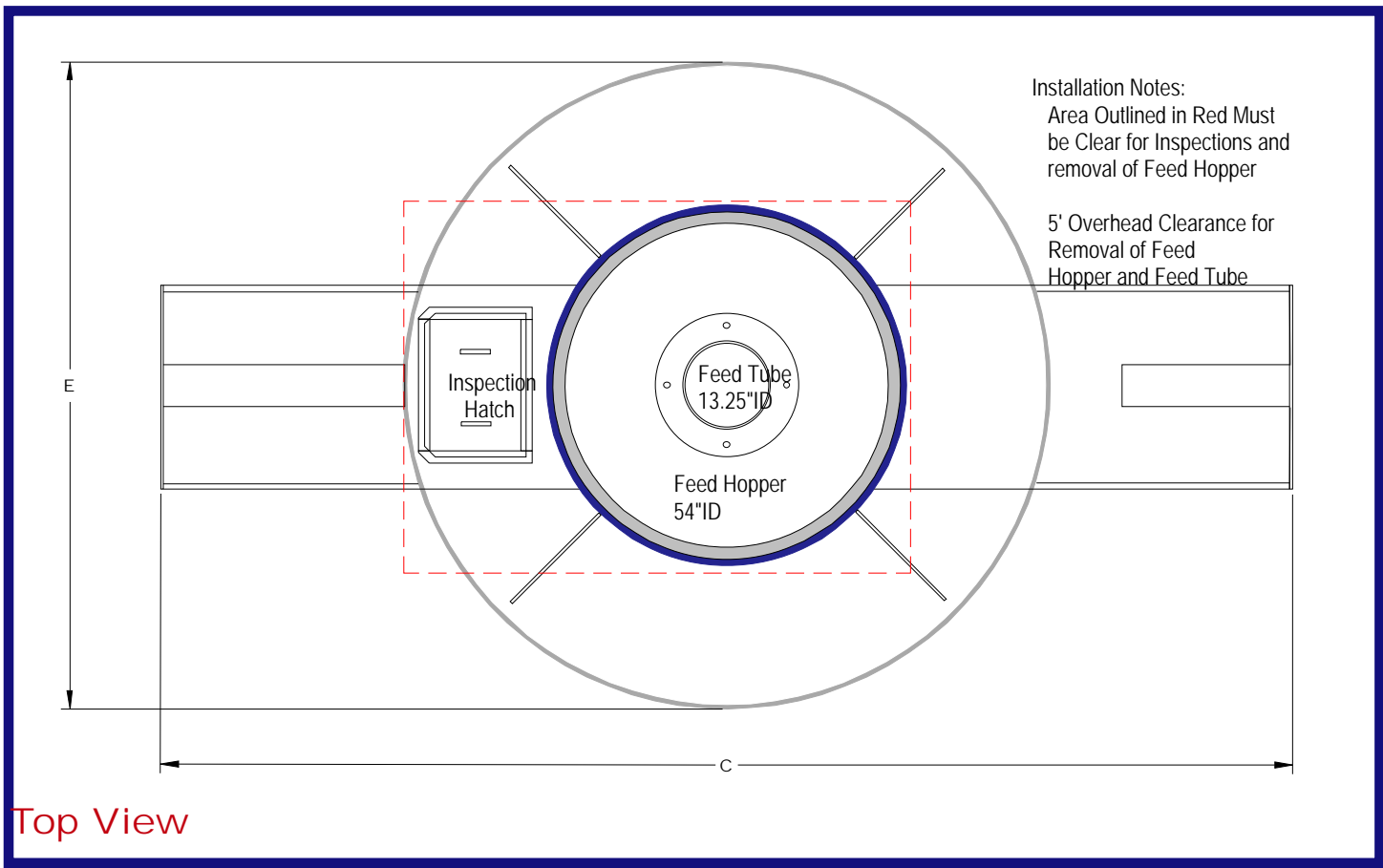
Throughput Range Varies With Rotor Speed and Toughness of Material (How Easily Does Material Shatter?)  
Typically, A Low LA Abrasion Number Means the Material Is Difficult to Shatter. In These Cases, Rotor Speed Is Increased and Return Load is Higher.

The throughput information is based on actual experience. Materials vary in abrasiveness, toughness and quality. Capacity and Output will vary with the material to be crushed and could be outside of the stated ranges.

Gradation Comparison				
Auto-Balance Impact vs. 4-Shoe Table Against Anvils				
Sieve Size	Feed—% Retained		Output—% Retained	
	ABI	Shoe/Anvil	ABI	Shoe/Anvil
2	0	0	0	0
1-1/2	0	3	0	0
1	21	25	6	12
7/8	9	8	4	3
3/4	11	13	10	11
5/8	15	17	9	9
1/2	15	14	12	13
3/8	10	8	11	10
#4	14	11	22	20
#10	2	1	13	11
#20	1	0	5	5
#200	2	1	6	5
#200-	0	0	2	1



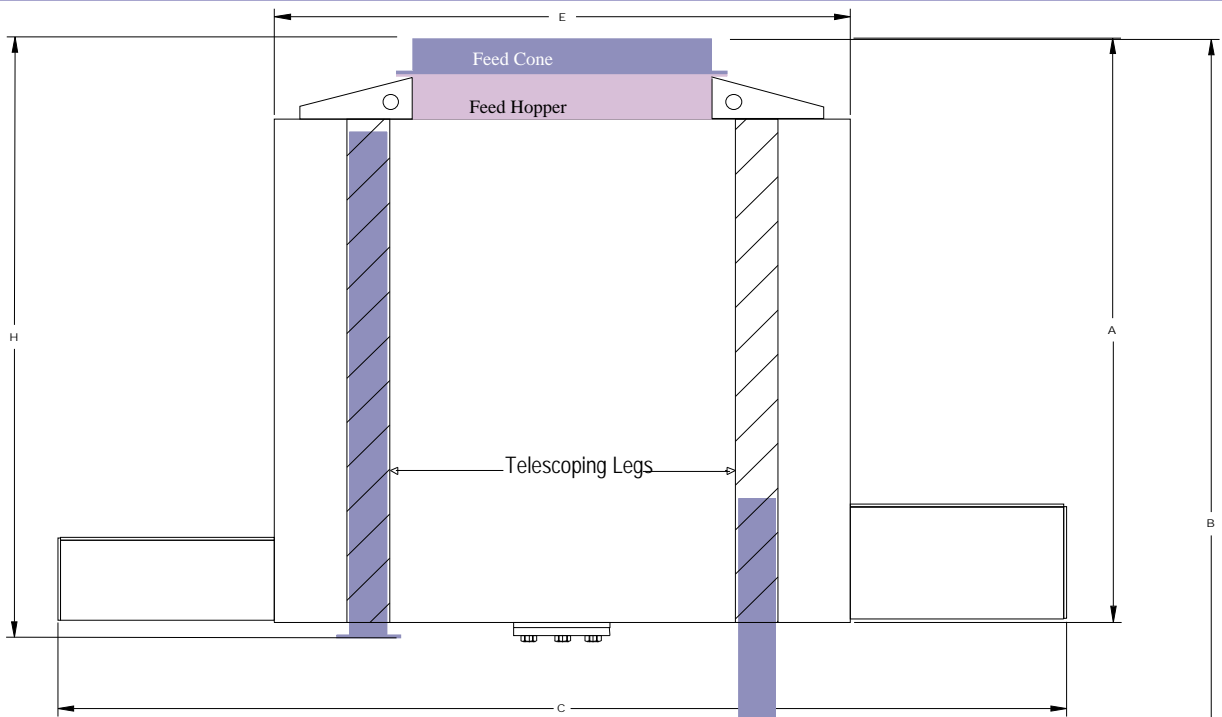
Bottom View



Top View

# Dimensions

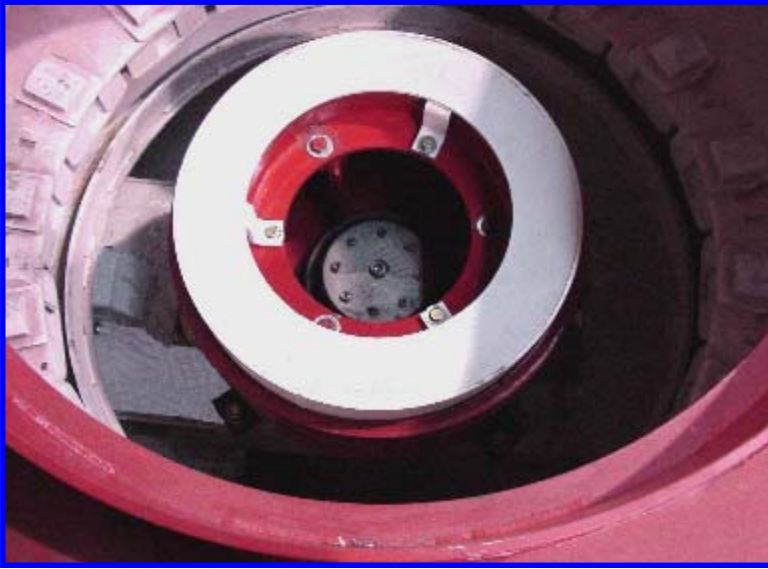
Model		A	B	C	D	E	F	G	H	Weight	
# Motors											
<b>200</b>	in	111	163 - 187	200	82	108	90	36	115	lb	30,500
<b>Single</b>	cm	282	414 - 475	482	208	274	228	91	292	kg	13,839
<b>250</b>	in	111	163 - 187	200	82	108	90	36	115	lb	31,000
<b>Single</b>	cm	282	414 - 475	482	208	274	228	91	292	kg	14,066
<b>300</b>	in	111	163 - 187	200	82	108	90	36	115	lb	31,500
<b>Single</b>	cm	282	414 - 475	482	208	274	228	91	292	kg	14,293
<b>400</b>	in	111	163 - 187	200	82	108	90	36	115	lb	32,500
<b>Dual</b>	cm	282	414 - 475	482	208	274	228	91	292	kg	14,746
<b>500</b>	in	111	163 - 187	200	82	108	90	36	115	lb	33,000
<b>Dual</b>	cm	282	414 - 475	482	208	274	228	91	292	kg	14,973
<b>600</b>	in	111	163 - 187	200	82	108	90	36	115	lb	35,000
<b>Dual</b>	cm	282	414 - 475	482	208	274	228	91	292	kg	15,880



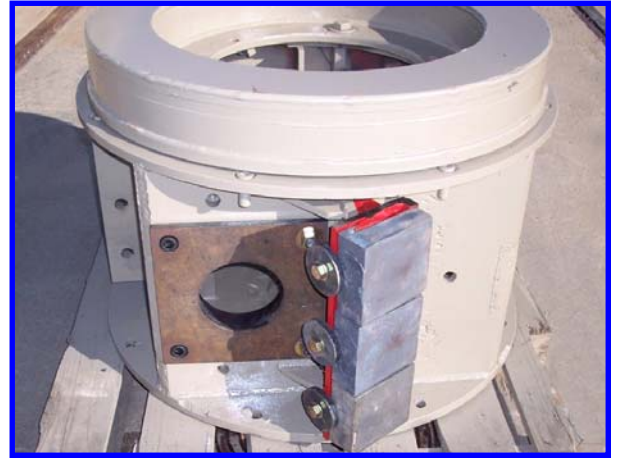
Side View

Legs Telescope and Can Be Set  
4', 5' or 6' From the Ground

# Auto-Balance Impact Crusher Standard Features



Inside of Crusher-Room to stand  
between Rotor & Rock Shelves



Rotor/Auto-Balance Assembly  
with Wear-Parts in Port



Telescoping Leg-Shipping



Telescoping Leg at 6 ft. Height



Crusher to Conveyor  
Discharge Box:  
16 degree angle with  
Door for entrance through  
bottom of Crusher for  
inspection and mainte-  
nance. Properly enclosed,  
helps to minimize dust  
escaping from Crusher.



## Hydraulic Belt Tension Adjustment



Bolts securing Motor Stand are outside Belt Tunnel



Hydraulic Pump with Pressure Gauge



Hydraulic Cylinder attaches to Motor Stand and to Pump



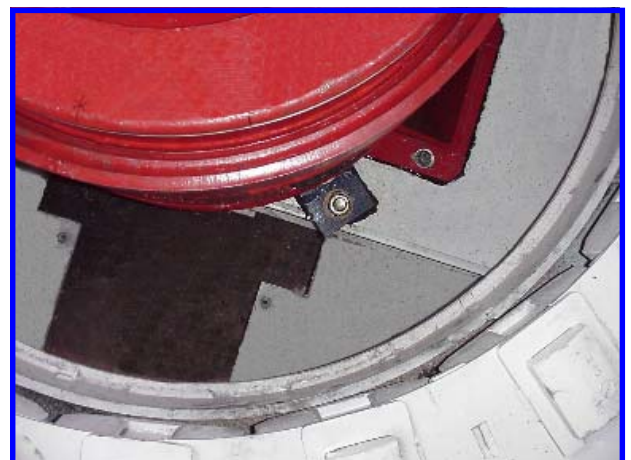
Grease Valve– splits between Top and Bottom Bearings



Top Inspection Hatch– Hinged for easier access



Anvils in top and bottom rock shelves insure solid rock pack. Anvils last 3000 to 5000 hours. Anvils in top can be rotated 180 degrees and used in the bottom because of the wear pattern.



Bolts easily accessible and placed so impact wrench can be used

**Model 300**



## Auto-Balance Impact Crusher Models



**Model 600,  
No Legs  
Mount on  
Platform  
or Chassis**

**Model 600**



**Hydraulic System on Legs raises Crusher so Trailer can back under the Crusher. Eliminates need for Crane to load or unload the Crusher. Portable without expense of a chassis.**

**Portable ABI Crusher with A-Frame Chassis**



**Diesel Power Unit with Right Angle Gear Drive  
A-Frame Chassis  
36in. X 12ft. Under Crusher Conveyor  
36in. X 40ft. Feed Conveyor**



## **Parts And Service**

**Scheduled and Emergency In Plant Service - Fully Equipped Service Trucks**

**Parts - 95% of Parts Orders Ship in 48 Business Hours**

**Rotor/Balancer Assembly and Bearing Assembly Exchange Program**

**If necessary and possible, crusher can be customized to your application**

**Installation and Initial Training Included in Purchase Price**

**Operating and Maintenance Instruction Manuals**

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## **Heard Around the Plant**

*“...the best equipment investment our company has ever made, we now have 3 machines...”*

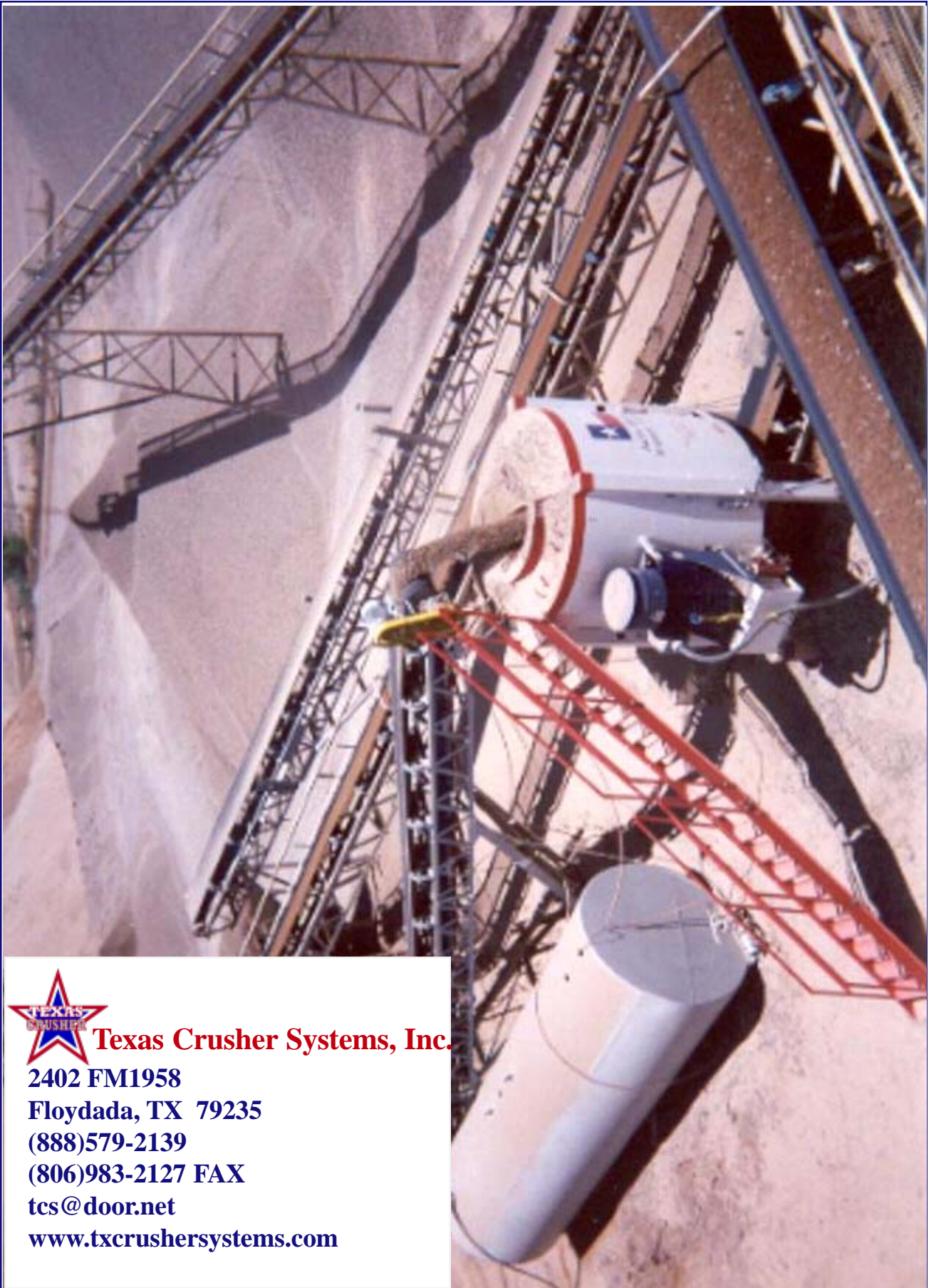
*“...downtime went from 25% to 5% after we replaced our other VSI with the “Texas”.”*

*“...wear-parts cost decreased from \$1.00/ton with my shoe and anvil VSI to \$0.05/ton with the “Texas”. We were changing shoes every 6 hours in the shoe and anvil VSI - with the “Texas”, we change parts every 600 to 800 hours. A huge cost savings.”*

*“...gradations are consistent crushing rock-on-rock in the Texas. Crushing against anvils, gradations were constantly changing as the anvils wore.”*

*“.....we are crushing 1/2” X 3/8” to sand feeding directly from a wet screen. With our other VSI, the water was a real problem. This has assisted in turning a waste material into pay material”*

*Note: The Auto-Balance Impact Crusher is commonly referred to as the “Texas”.*



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