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BUREAU OF AIR REGULATIO

***ANGELO'S RECYCLED
MATERIALS, INC.***
Aggregate Crushing Plant No.4

**FDEP "after-the-fact" Construction
Permit Application**

AUGUST - 1999



Department of Environmental Protection

Division of Air Resources Management

APPLICATION FOR AIR PERMIT - NON-TITLE V SOURCE

See Instructions for Form No. 62-210.900(3)

I. APPLICATION INFORMATION

Identification of Facility

1. Facility Owner/Company Name: ANGELO'S RECYCLED MATERIALS, INC.	
2. Site Name: ANGELO'S RECYCLED MATERIALS, INC. - RECLAIMED CRUSHING UNIT NO. 4	
3. Facility Identification Number: <input type="checkbox"/> Unknown	
4. Facility Location: Street Address or Other Locator: 1201 E. -148th Avenue (3/4 mile south of Bearss Avenue) City: Tampa County: Hillsborough Zip Code: 33613	
5. Relocatable Facility? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6. Existing Permitted Facility? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Application Contact

1. Name and Title of Application Contact: Mr. Bernard A. Ball, Jr., Environmental Engineer	
2. Application Contact Mailing Address: Organization/Firm: Central Florida Testing Laboratories, Inc. Street Address: 12625 - 40th Street North City: Clearwater State: Florida Zip Code: 33762	
3. Application Contact Telephone Numbers: Telephone: (727) 572-9797 Fax: (727) 299-0023	

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	9-2-99
2. Permit Number:	7775692 - 001 - AC

Purpose of Application

Air Operation Permit Application

This Application for Air Permit is submitted to obtain: (Check one)

- Initial non-Title V air operation permit for one or more existing, but previously unpermitted, emissions units.
- Initial non-Title V air operation permit for one or more newly constructed or modified emissions units.

Current construction permit number: _____

- Non-Title V air operation permit revision to address one or more newly constructed or modified emissions units.

Current construction permit number: _____

Operation permit number to be revised: _____

- Initial non-Title V air operation permit under Rule 62-210.300(2)(b), F.A.C., for an existing facility seeking classification as a synthetic non-Title V source.

Current operation/construction permit number(s):

- Non-Title V air operation permit revision for a synthetic non-Title V source. Give reason for revision; e.g., to address one or more newly constructed or modified emissions units.

Operation permit number to be revised: _____

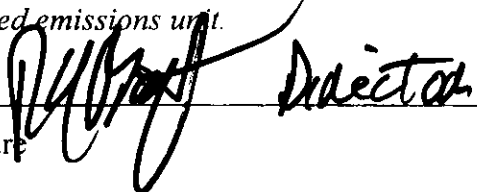
Reason for revision: _____

Air Construction Permit Application

This Application for Air Permit is submitted to obtain: (Check one)

- Air construction permit to construct or modify one or more emissions units.
- Air construction permit to make federally enforceable an assumed restriction on the potential emissions of one or more existing, permitted emissions units.
- Air construction permit for one or more existing, but unpermitted, emissions units.

Owner/Authorized Representative

1. Name and Title of Owner/Authorized Representative: Mr. Richard A. Bazinet, Director of Florida Operations
2. Owner/Authorized Representative Mailing Address: Organization/Firm: Angelo's Recycled Materials, Inc. Street Address: Post Office Box 1493 City: Largo State: Florida Zip Code: 33779
3. Owner/Authorized Representative Telephone Numbers: Telephone: (727) 581-1544 Fax: (727) 586-5676
4. Owner/Authorized Representative Statement: <i>I, the undersigned, am the owner or authorized representative* of the facility addressed in this application. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof. I understand that a permit, if granted by the Department, cannot be transferred without authorization from the Department, and I will promptly notify the Department upon sale or legal transfer of any permitted emissions unit.</i> Signature:  Director Date: 8-9-99

* Attach letter of authorization if not currently on file.

Professional Engineer Certification

1. Professional Engineer Name: Mr. George C. Sinn, Jr., P.E. Registration Number: 16911
2. Professional Engineer Mailing Address: Organization/Firm: Central Florida Testing Laboratories, Inc. Street Address: 12625 - 40th Street North City: Clearwater State: Florida Zip Code: 33762
3. Professional Engineer Telephone Numbers: Telephone: (727) 572-9797 Fax: (727) 299-0023

4. Professional Engineer Statement:

I, the undersigned, hereby certify, except as particularly noted herein, that:*

(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this Application for Air Permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

If the purpose of this application is to obtain an air construction permit for one or more proposed new or modified emissions units (check here [X], if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

If the purpose of this application is to obtain an initial air operation permit or operation permit revision for one or more newly constructed or modified emissions units (check here [], if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.

Signature

Date

(seal)

- Attach any exception to certification statement.
- *With the exception of manufacturers efficiency and production guarantees.*

Scope of Application

Emissions Unit ID	Description of Emissions Unit	Permit Type	Processing Fee
001	Cedarapids Inc. – Raw Material Receiving Hopper / Vibrating Grizzly Feeder System – used to feed uncrushed material to crusher.	AC1E	\$1000.00
002	Cedarapids, Inc. Model #3054 Jaw Crusher and Discharge Pan – where crushed material exits crushing unit and falls onto conveyor belt	AC1E	
003	Cedarapids Cone Crusher Model RC5411 – used to crush oversize material which does not pass through vibrating screener.	AC1E	
004	Cedarapids Vibrating Screening Deck – used to separate crushed material into a desired size.	AC1E	
005	Magnet Transfer Drop Point – used to separate metal material from re-crushed oversize material (drop point ~ 2 feet)	AC1E	
006	Radial Stacker Belt – drop point where material falls from belt to crushed material stockpile	AC1E	
007	Emissions from 325 H.P. Caterpillar, Model # 3512 (910kW) Diesel Generator – fired on No.2 virgin diesel fuel – used to power all equipment employed by this crushing - aggregate processing unit.	AC1E	\$1000.00
008	Fugitive emissions from paved and unpaved roads.		
009	Fugitives from on site storage piles		

Application Processing Fee

Check one: [] Attached - Amount: **\$2000.00** [] Not Applicable

Construction/Modification Information

1. Description of Proposed Project or Alterations:

This project consists of an “after-the-fact” State Wide Construction Permit application for a portable Cedarapids, Inc. Aggregate Crushing & Processing Plant owned and operated by Angelo’s Recycled Materials, Inc. This crushing will serve the sole purpose of crushing and processing and reclaimed asphalt concrete that is recycled from the road, buildings, etc. and will be reused in the building or construction industry. This crushing unit has the capability of being portable and will travel from site to site “statewide”. The Crushing Unit is referred to as “Reclaimed Crushing Unit No.4” is now located and sitting stationary, south of Bearss Avenue at the intersection of 148th Avenue and 12th Street in Tampa, Hillsborough County, Florida. This unit is powered by a 325 H.P. Caterpillar Diesel Generator fired on Virgin No.2 fuel oil with a maximum sulfur limit of 0.5% by weight.

Stockpiles and Roadways at this facility are watered on a regular basis by a sprinker system and a 5 mph speed limit is enforced as to control any fugitive emissions that may be generated by vehicular traffic or prevailing winds.

This facility is a natural non-Title V facility and will comply with all FDEP Rules and Regulations.

2. Projected or Actual Date of Commencement of Construction: NA (existing source)

3. Projected Date of Completion of Construction: NA (already constructed)

Application Comment

This project consists of an “after-the-fact” State Wide Construction Permit application for a portable Cedarapids, Inc. Aggregate Crushing & Processing Plant owned and operated by Angelo’s Recycled Materials, Inc. This crushing will serve the sole purpose of crushing and processing and reclaimed asphalt concrete that is recycled from the road, buildings, etc. and will be reused in the building or construction industry. This crushing unit has the capability of being portable and will travel from site to site “statewide”. The Crushing Unit is referred to as “Reclaimed Crushing Unit No.4” is now located and sitting stationary, south of Bearss Avenue at the intersection of 148th Avenue and 12th Street in Tampa, Hillsborough County, Florida. This unit is powered by a 325 H.P. Caterpillar Diesel Generator fired on Virgin No.2 fuel oil with a maximum sulfur limit of 0.5% by weight.

Stockpiles and Roadways at this facility are watered on a regular basis by a sprinker system and a 5 mph speed limit is enforced as to control any fugitive emissions that may be generated by vehicular traffic or prevailing winds.

This facility is a natural non-Title V facility and will comply with all FDEP Rules and Regulations.

Facility Regulatory Classifications

Check all that apply:

1. <input type="checkbox"/> Small Business Stationary Source?	<input checked="" type="checkbox"/> Unknown
2. <input checked="" type="checkbox"/> Synthetic Non-Title V Source?	
3. <input checked="" type="checkbox"/> Synthetic Minor Source of Pollutants Other than HAPs?	
4. <input checked="" type="checkbox"/> Synthetic Minor Source of HAPs?	
5. <input checked="" type="checkbox"/> One or More Emissions Units Subject to NSPS?	
6. <input type="checkbox"/> One or More Emission Units Subject to NESHAP Recordkeeping or Reporting?	
7. Facility Regulatory Classifications Comment (limit to 200 characters):	
<p>Natural Non-Title V Source</p>	

Rule Applicability Analysis

This facility is subject to the rules and provisions of 40 CFR 60, subpart 000.

B. FACILITY POLLUTANTS

List of Pollutants Emitted

1. Pollutant Emitted	2. Pollutant Classif.	3. Requested Emissions Cap		4. Basis for Emissions Cap	5. Pollutant Comment
		lb/hour	tons/year		
PM10	SM	NA	NA	RULE	<10% opacity from drop points, storage
PM	SM	NA	NA	RULE	Piles, <15% from crusher
SO2	SM	NA	NA	RULE	Emissions from diesel generator
NOx	SM	NA	NA	RULE	Subject to opacity limitations only
CO	SM	NA	NA	RULE	FAC 62-296.310
TOC	SM	NA	NA	RULE	"

EMISSIONS ID. NO. 001

200 TPH Cedarapids – Grizzly Feeder

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through G as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in This Section: (Check one) <input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent). <input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions. <input checked="" type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.		
2. Description of Emissions Unit Addressed in This Section (limit to 60 characters): Cedarapids Inc. – Raw Material Receiving Hopper / Vibrating Grizzly Feeder System – used to feed uncrushed material to crusher.		
3. Emissions Unit Identification Number: ID: 001		<input type="checkbox"/> No ID <input type="checkbox"/> ID Unknown
3. Emissions Unit Status Code: ACTIVE	4. Initial Startup Date: UNKNOWN	5. Emissions Unit Major Group SIC Code: 14
6. Emissions Unit Comment: (Limit to 500 Characters): <p>THIS AGGREGATE PROCESSING UNIT WILL CRUSH AND SCREEN ASPHALT ONLY, THEREFORE EMISSIONS WILL BE NIL TO NONE FROM THIS EMISSIONS UNIT. SHOULD ANY OCCUR THE MATERIAL WILL BE SPRAYED AS TO CONTROL ANY EMISSIONS GENERATED.</p>		

Emissions Unit Information Section 1 of 9

Receiving Hopper – Vibrating Grizzly Feeder

Emissions Unit Control Equipment

1. Control Equipment/Method Description (limit to 200 characters per device or method):

ANY EMISSIONS THAT MAY BE GENERATED BY DUMPING OF UNCRUSHED MATERIAL INTO RECEIVING HOPPER AND VIBRATION OF MATERIAL BY GRIZZLY FEEDER INTO CRUSHER ARE CONTROLLED AT THIS FACILITY BY DAMPENING MATERIAL AS NEEDED AS TO CONTROL GENERATION OF FUGITIVES

2. Control Device or Method Code(s): **061,099**

Emissions Unit Details

1. Package Unit: **RAW MATERIAL RECEIVING HOPPER / VIBRATING GRIZZLY FEEDER SYSTEM**

Manufacturer: **CEDARAPIDS**

Model Number: **NA**

2. Generator Nameplate Rating: **MW**

3. Incinerator Information:

Dwell Temperature: **°F**

Dwell Time: **seconds**

Incinerator Afterburner Temperature: **°F**

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate: **mmBtu/hr**

2. Maximum Incineration Rate: **lb/hr** **tons/day**

3. Maximum Process or Throughput Rate: **200 TPH AS RAW (UNCRUSHED) RECLAIMED ASPHALT OR CONCRETE**

4. Maximum Production Rate: **200 TPH AS RECLAIMED CRUSHED AND SCREENED ASPHALT (RAP) OR CONCRETE**

5. Requested Maximum Operating Schedule:

10 hours/day **6 days/week**

52 weeks/year **3120 hours/year**

7. Operating Capacity/Schedule Comment (limit to 200 characters):

Dampened, uncrushed reclaimed asphalt material is fed into the material receiving hopper and grizzly feeder of the plant where any fugitive emissions generated are controlled by water spray heads mounted in the receiving hopper which sprays the material before it enters the grizzly feeder and crusher.

Emissions Unit Information Section 1 of 9

Receiving Hopper – Vibrating Grizzly Feeder

B. EMISSION POINT (STACK/VENT) INFORMATION

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? 001 (Grizzly Feeder)		2. Emission Point Type Code: 4	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point): NONE			
3. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: NONE			
4. Discharge Type Code: F	6. Stack Height: feet	7. Exit Diameter: feet	
8. Exit Temperature: °F	9. Actual Volumetric Flow Rate: acfm	10. Water Vapor: %	
11. Maximum Dry Standard Flow Rate: dscfm		12. Nonstack Emission Point Height: ~15 FEET	
13. Emission Point UTM Coordinates: (Relocatable source figures below are location now) Zone: 17 East (km): 357.8 North (km): 3107.2			
14. Emission Point Comment (limit to 200 characters): EMISSIONS POINT WILL BE FUGITIVE IF ANY EMISSIONS GENERATED AT ALL			

Receiving Hopper – Vibrating Grizzly Feeder

C. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment _____ of _____

1. Segment Description (Process/Fuel Type) (limit to 500 characters): Cedarapids Inc. – Raw Material Receiving Hopper / Vibrating Grizzly Feeder System – used to feed uncrushed material to crusher.		
2. Source Classification Code (SCC): 30502511		3. SCC Units: TONS OF PRODUCT PROCESSED
4. Maximum Hourly Rate: 200 tph	5. Maximum Annual Rate: 624,000 ton	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: NA	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters):		

Segment Description and Rate: Segment _____ of _____

1. Segment Description (Process/Fuel Type) (limit to 500 characters):		
2. Source Classification Code (SCC):		3. SCC Units:
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters):		

D. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION

Potential Emissions

1. Pollutant Emitted: PM, PM10		2. Pollutant Regulatory Code: WP	
3. Primary Control Device Code: 061	4. Secondary Control Device Code: 099	5. Total Percent Efficiency of Control: 80%	
6. Potential Emissions: PM10 = 0.42 lb/hr & 0.65 ton/hr PM = 0.88 lb/hr & 1.36 ton/hr		7. Synthetically Limited? [X]	
8. Emission Factor: 0.0021 lb/ton Reference: AP-42		8. Emissions Method Code: 3	
10. Calculation of Emissions (limit to 600 characters): $PM_{10} = (200 \text{ lb/ton})(0.0021 \text{ lb/ton}) = 0.42 \text{ lb/hr}$ $PM_{10_{\text{yearly}}} [(200 \text{ lb/hr})(3120 \text{ hr/yr})(0.0021 \text{ lb/ton})] / 2000 \text{ lb/ton} = 0.65 \text{ ton/yr}$ $PM = [(200 \text{ lb/ton})(0.0021 \text{ lb/ton})] (2.1) = 0.88 \text{ lb/hr}$ $PM_{10_{\text{yearly}}} [(200 \text{ lb/hr})(3120 \text{ hr/yr})(0.0021 \text{ lb/ton})] / 2000 \text{ lb/ton} (2.1) = 1.36 \text{ ton/yr}$			
11. Pollutant Potential Emissions Comment (limit to 200 characters): Raw Material Receiving Hopper / Grizzly Feeder – subject to 40 CFR 60, subpart 000 rules and regulations.			

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code: 40 CFR 60, subpart 000	2. Future Effective Date of Allowable Emissions: Initial Compliance Test
3. Requested Allowable Emissions and Units: < 10 % Opacity	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters): Initial and Annual EPA Method 9 Compliance Testing	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

Cedarapids Raw material Grizzly Feeder

G. EMISSIONS UNIT SUPPLEMENTAL INFORMATION

Supplemental Requirements

1. Process Flow Diagram <input checked="" type="checkbox"/> Attached, Document ID: <u>III</u> [] Not Applicable [] Waiver Requested
2. Fuel Analysis or Specification [] Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable [] Waiver Requested
3. Detailed Description of Control Equipment <input checked="" type="checkbox"/> Attached, Document ID: <u>V</u> [] Not Applicable [] Waiver Requested
4. Description of Stack Sampling Facilities [] Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable [] Waiver Requested
5. Compliance Test Report [] Attached, Document ID: _____ [] Previously submitted, Date: _____ <input checked="" type="checkbox"/> Not Applicable
6. Procedures for Startup and Shutdown [] Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable [] Waiver Requested
7. Operation and Maintenance Plan <input checked="" type="checkbox"/> Attached, Document ID: <u>VI</u> [] Not Applicable [] Waiver Requested
8. Supplemental Information for Construction Permit Application <input checked="" type="checkbox"/> Attached, Document ID: <u>VII</u> [] Not Applicable
9. Other Information Required by Rule or Statute [] Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
10. Supplemental Requirements Comment:

EMISSIONS ID. NO. 002

Cedarapids Model 3054 Jaw Crusher

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through G as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in This Section: (Check one) <input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent). <input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions. <input checked="" type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.		
9. Description of Emissions Unit Addressed in This Section (limit to 60 characters): Cedarapids, Inc. Model #3054 Jaw Crusher and Discharge Pan – where crushed material exits crushing unit and falls onto conveyor belt.		
3. Emissions Unit Identification Number: ID: 002		<input type="checkbox"/> No ID <input type="checkbox"/> ID Unknown
10. Emissions Unit Status Code: ACTIVE	11. Initial Startup Date: UNKNOWN	12. Emissions Unit Major Group SIC Code: 14
13. Emissions Unit Comment: (Limit to 500 Characters): <p style="text-align: center;">THIS AGGREGATE PROCESSING UNIT WILL CRUSH AND CONVEY RECLAIMED ASPHALT ONLY, THEREFORE EMISSIONS WILL BE NIL TO NONE FROM THIS EMISSIONS UNIT. SHOULD ANY OCCUR THE MATERIAL WILL BE SPRAYED AS TO CONTROL ANY EMISSIONS GENERATED.</p>		

Cedarapids Model 3054 Jaw Crusher

Emissions Unit Control Equipment

6. Control Equipment/Method Description (limit to 200 characters per device or method):

ANY EMISSIONS THAT MAY BE GENERATED BY CRUSHING AND DISCHARGING OF UNCRUSHED MATERIAL ONTO DISCHARGE PAN AND CONVEYOR BELT INTO CRUSHER ARE CONTROLLED AT THIS FACILITY BY DAMPENING MATERIAL AS NEEDED AS TO CONTROL GENERATION OF FUGITIVES

2. Control Device or Method Code(s): **061,099**

Emissions Unit Details

1. Package Unit: **CRUSHER / DISCHARGE PAN**

Manufacturer: **CEDARAPIDS**

Model Number: **3054**

2. Generator Nameplate Rating:

MW

3. Incinerator Information:

Dwell Temperature:

°F

Dwell Time:

seconds

Incinerator Afterburner Temperature:

°F

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:

mmBtu/hr

2. Maximum Incineration Rate:

lb/hr

tons/day

3. Maximum Process or Throughput Rate:

200 TPH AS RAW (UNCRUSHED)

RECLAIMED ASPHALT OR CONCRETE

4. Maximum Production Rate: **200 TPH AS RECLAIMED CRUSHED AND SCREENED**

ASPHALT (RAP) OR CONCRETE

5. Requested Maximum Operating Schedule:

10 hours/day

6 days/week

52 weeks/year

3120 hours/year

14. Operating Capacity/Schedule Comment (limit to 200 characters):

Dampened, uncrushed reclaimed asphalt material is fed into the crusher from the receiving hopper and grizzly feeder of the plant where it is crushed and discharged to the discharge pan where it fall onto a conveyor belt. Any fugitive emissions generated are controlled by dampening of the material before it enters the grizzly feeder and crusher as needed.

B. EMISSION POINT (STACK/VENT) INFORMATION

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? 002 (Cone Crusher)		7. Emission Point Type Code: 4	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point): NONE			
8. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: NONE			
9. Discharge Type Code: F	6. Stack Height: feet	7. Exit Diameter: feet	
8. Exit Temperature: °F	9. Actual Volumetric Flow Rate: acfm	10. Water Vapor: %	
11. Maximum Dry Standard Flow Rate: dscfm		12. Nonstack Emission Point Height: ~7 FEET	
13. Emission Point UTM Coordinates: (Relocatable unit figures below are location now) Zone: 17 East (km): 357.8 North (km): 3107.2			
14. Emission Point Comment (limit to 200 characters): EMISSIONS POINT WILL BE FUGITIVE IF ANY EMISSIONS GENERATED AT ALL			

Emissions Unit Information Section 2 of 9

Cedarapids Model 3054 Jaw Crusher

C. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment _____ of _____

1. Segment Description (Process/Fuel Type) (limit to 500 characters): Cedarapids, Inc. – Portable Impact Crushing Unit Model 3054 – Crusher Discharge Pan/Belt. (Material Handling - Emissions related to dropping material out of crusher onto belt.)		
3. Source Classification Code (SCC): 30502511		3. SCC Units: TONS OF PRODUCT PROCESSED
4. Maximum Hourly Rate: 200 tph	10. Maximum Annual Rate: 624,000 ton	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: NA	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters):		

Segment Description and Rate: Segment _____ of _____

1. Segment Description (Process/Fuel Type) (limit to 500 characters):		
2. Source Classification Code (SCC):		3. SCC Units:
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters):		

D. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION

Potential Emissions

1. Pollutant Emitted: PM, PM10		2. Pollutant Regulatory Code: WP	
3. Primary Control Device Code: 061	4. Secondary Control Device Code: 099	5. Total Percent Efficiency of Control: 80%	
6. Potential Emissions: PM10 = 0.42 lb/hr & 0.66 ton/hr PM = 0.88 lb/hr & 1.39 ton/hr		7. Synthetically Limited? [X]	
8. Emission Factor: 0.0021 lb/ton Reference: AP-42 (Table 11.19.2-2 controlled) and footnote © for PM Emissions		15. Emissions Method Code: 3	
10. Calculation of Emissions (limit to 600 characters): $PM_{10} = (200 \text{ lb/ton})(0.0021 \text{ lb/ton}) = 0.42 \text{ lb/hr}$ $PM_{10_{\text{yearly}}} [(200 \text{ lb/hr})(3120 \text{ hr/yr})(0.0021 \text{ lb/ton})] / 2000 \text{ lb/ton} = 0.66 \text{ ton/yr}$ $PM = [(200 \text{ lb/ton})(0.0021 \text{ lb/ton})] (2.1) = 0.88 \text{ lb/hr}$ $PM_{10_{\text{yearly}}} [(200 \text{ lb/hr})(3120 \text{ hr/yr})(0.0021 \text{ lb/ton})] / 2000 \text{ lb/ton} (2.1) = 1.39 \text{ ton/yr}$			
11. Pollutant Potential Emissions Comment (limit to 200 characters): Crusher and Discharge Pan – subject to 40 CFR 60, subpart 000 rules and regulations.			

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code: 40 CFR 60, subpart 000	2. Future Effective Date of Allowable Emissions: Initial Compliance Test	
3. Requested Allowable Emissions and Units: < 15 % Opacity	4. Equivalent Allowable Emissions: lb/hour tons/year	
5. Method of Compliance (limit to 60 characters): Initial and Annual EPA Method 9 Compliance Testing		
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):		

G. EMISSIONS UNIT SUPPLEMENTAL INFORMATION

Supplemental Requirements

1. Process Flow Diagram <input checked="" type="checkbox"/> Attached, Document ID: <u>III</u> <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
2. Fuel Analysis or Specification <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
3. Detailed Description of Control Equipment <input checked="" type="checkbox"/> Attached, Document ID: <u>V</u> <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
4. Description of Stack Sampling Facilities <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
5. Compliance Test Report <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Previously submitted, Date: _____ <input checked="" type="checkbox"/> Not Applicable
6. Procedures for Startup and Shutdown <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
7. Operation and Maintenance Plan <input checked="" type="checkbox"/> Attached, Document ID: <u>VI</u> <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
8. Supplemental Information for Construction Permit Application <input checked="" type="checkbox"/> Attached, Document ID: <u>VII</u> <input type="checkbox"/> Not Applicable
9. Other Information Required by Rule or Statute <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
10. Supplemental Requirements Comment:

EMISSIONS ID. NO. 003

Cedarapids Cone Crusher Model RC5411

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through G as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in This Section: (Check one) <input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent). <input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions. <input checked="" type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.		
16. Description of Emissions Unit Addressed in This Section (limit to 60 characters): Cedarapids, Inc. Model #RC5411 Cone Crusher and Discharge Pan – where oversize material is crushed and crushed material exits crushing unit and falls onto conveyor belt.		
3. Emissions Unit Identification Number: ID: 003		<input type="checkbox"/> No ID <input type="checkbox"/> ID Unknown
17. Emissions Unit Status Code: ACTIVE	18. Initial Startup Date: UNKNOWN	19. Emissions Unit Major Group SIC Code: 14
20. Emissions Unit Comment: (Limit to 500 Characters): <p style="text-align: center;">THIS AGGREGATE PROCESSING UNIT WILL CRUSH AND CONVEY RECLAIMED ASPHALT ONLY, THEREFORE EMISSIONS WILL BE NIL TO NONE FROM THIS EMISSIONS UNIT. SHOULD ANY OCCUR THE MATERIAL WILL BE SPRAYED AS TO CONTROL ANY EMISSIONS GENERATED.</p>		

Emissions Unit Information Section 3 of 9
Cedarapids Model RC5411 Cone Crusher
Emissions Unit Control Equipment

11. Control Equipment/Method Description (limit to 200 characters per device or method):

ANY EMISSIONS THAT MAY BE GENERATED BY CRUSHING AND DISCHARGING OF UNCRUSHED MATERIAL ONTO DISCHARGE PAN OF CONE CRUSHING SYSTEM AND CONVEYOR BELT INTO CRUSHER ARE CONTROLLED AT THIS FACILITY BY DAMPENING MATERIAL AS NEEDED AS TO CONTROL GENERATION OF FUGITIVES

2. Control Device or Method Code(s): **061,099**

Emissions Unit Details

1. Package Unit: **CONE CRUSHER / DISCHARGE PAN**

Manufacturer: **CEDARAPIDS**

Model Number: **RC5411**

2. Generator Nameplate Rating:

MW

3. Incinerator Information:

Dwell Temperature:

°F

Dwell Time:

seconds

Incinerator Afterburner Temperature:

°F

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:

mmBtu/hr

2. Maximum Incineration Rate:

lb/hr

tons/day

3. Maximum Process or Throughput Rate:

200 TPH AS RAW (UNCRUSHED)

RECLAIMED ASPHALT OR CONCRETE

4. Maximum Production Rate:

200 TPH AS RECLAIMED CRUSHED AND SCREENED ASPHALT (RAP) OR CONCRETE

5. Requested Maximum Operating Schedule:

10 hours/day

6 days/week

52 weeks/year

3120 hours/year

21. Operating Capacity/Schedule Comment (limit to 200 characters):

Dampened oversized material that bypasses the vibrating screener is fed into the cone crusher from the vibrating screener of the plant where it is crushed and discharged to the discharge pan where it fall onto a conveyor belt. Any fugitive emissions generated are controlled by dampening of the material before it enters the grizzly feeder and crusher as needed.

B. EMISSION POINT (STACK/VENT) INFORMATION

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? 003 (cone crusher)		12. Emission Point Type Code: 4	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point): NONE			
13. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: NONE			
14. Discharge Type Code: F	6. Stack Height: feet	7. Exit Diameter: feet	
8. Exit Temperature: °F	9. Actual Volumetric Flow Rate: acfm	10. Water Vapor: %	
11. Maximum Dry Standard Flow Rate: dscfm		12. Nonstack Emission Point Height: ~7 FEET	
13. Emission Point UTM Coordinates: (Relocatable unit figures below are location now) Zone: 17 East (km): 357.8 North (km): 3107.2			
14. Emission Point Comment (limit to 200 characters): EMISSIONS POINT WILL BE FUGITIVE IF ANY EMISSIONS GENERATED AT ALL			

Emissions Unit Information Section 3 of 9

Cedarapids Model RC5411 Cone Crusher

C. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment _____ of _____

1. Segment Description (Process/Fuel Type) (limit to 500 characters): Cedarapids, Inc. – Portable Cone Crushing Unit Model RC5411 – Crusher Discharge Pan/Belt. (Material Handling – Emissions related to dropping material out of crusher onto belt.)		
4. Source Classification Code (SCC): 30502511		3. SCC Units: TONS OF PRODUCT PROCESSED
4. Maximum Hourly Rate: 200 tph	15. Maximum Annual Rate: 624,000 ton	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: NA	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters): 		

Segment Description and Rate: Segment _____ of _____

1. Segment Description (Process/Fuel Type) (limit to 500 characters): 		
2. Source Classification Code (SCC):		3. SCC Units:
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters): 		

D. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION

Potential Emissions

1. Pollutant Emitted: PM, PM10		2. Pollutant Regulatory Code: WP	
3. Primary Control Device Code: 061	4. Secondary Control Device Code: 099	5. Total Percent Efficiency of Control: 80%	
6. Potential Emissions: PM10 = 0.42 lb/hr & 0.66 ton/hr PM = 0.88 lb/hr & 1.39 ton/hr		7. Synthetically Limited? [X]	
8. Emission Factor: 0.0021 lb/ton Reference: AP-42 (Table 11.19.2-2 controlled) and footnote © for PM Emissions		22. Emissions Method Code: 3	
10. Calculation of Emissions (limit to 600 characters): $PM_{10} = (200 \text{ lb/hr})(0.0021 \text{ lb/ton}) = 0.42 \text{ lb/hr}$ $PM_{10, \text{yearly}} [(200 \text{ lb/hr})(3120 \text{ hr/yr})(0.0021 \text{ lb/ton})] / 2000 \text{ lb/ton} = 0.66 \text{ ton/yr}$ $PM = [(200 \text{ lb/hr})(0.0021 \text{ lb/ton})] (2.1) = 0.88 \text{ lb/hr}$ $PM_{10, \text{yearly}} [(200 \text{ lb/hr})(3120 \text{ hr/yr})(0.0021 \text{ lb/ton})] / 2000 \text{ lb/ton} (2.1) = 1.39 \text{ ton/yr}$			
11. Pollutant Potential Emissions Comment (limit to 200 characters): Cone Crusher and Discharge Pan – subject to 40 CFR 60, subpart 000 rules and regulations.			

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code: 40 CFR 60, subpart 000	2. Future Effective Date of Allowable Emissions: Initial Compliance Test
3. Requested Allowable Emissions and Units: < 15 % Opacity	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters): Initial and Annual EPA Method 9 Compliance Testing	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

**Emissions Unit Information Section 3 of 9
 Cedarapids Cone Crusher**

**E. VISIBLE EMISSIONS INFORMATION
 (Only Emissions Units Subject to a VE Limitation)**

Visible Emissions Limitation: Visible Emissions Limitation _____ of _____

1. Visible Emissions Subtype: VE	2. Basis for Allowable Opacity: <input checked="" type="checkbox"/> Rule <input type="checkbox"/> Other
3. Requested Allowable Opacity: Normal Conditions: <15% Exceptional Conditions: <15% Maximum Period of Excess Opacity Allowed: 0 min/hour	
4. Method of Compliance: Initial and Annual Visible Emissions Compliance Testing.	
5. Visible Emissions Comment (limit to 200 characters):	

**F. CONTINUOUS MONITOR INFORMATION
 (Only Emissions Units Subject to Continuous Monitoring)**

Continuous Monitoring System: Continuous Monitor _____ of _____

1. Parameter Code: NONE	2. Pollutant(s):
3. CMS Requirement:	<input type="checkbox"/> Rule <input type="checkbox"/> Other
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters):	

Cedarapids Cone Crusher

G. EMISSIONS UNIT SUPPLEMENTAL INFORMATION

Supplemental Requirements

1. Process Flow Diagram <input checked="" type="checkbox"/> Attached, Document ID: <u>III</u> <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
2. Fuel Analysis or Specification <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
3. Detailed Description of Control Equipment <input checked="" type="checkbox"/> Attached, Document ID: <u>V</u> <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
4. Description of Stack Sampling Facilities <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
5. Compliance Test Report <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Previously submitted, Date: _____ <input checked="" type="checkbox"/> Not Applicable
6. Procedures for Startup and Shutdown <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
7. Operation and Maintenance Plan <input checked="" type="checkbox"/> Attached, Document ID: <u>VI</u> <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
8. Supplemental Information for Construction Permit Application <input checked="" type="checkbox"/> Attached, Document ID: <u>VII</u> <input type="checkbox"/> Not Applicable
9. Other Information Required by Rule or Statute <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
10. Supplemental Requirements Comment:

EMISSIONS ID. NO. 004

Cedarapids Vibrating Screener

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through G as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in This Section: (Check one) <input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent). <input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions. <input checked="" type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.		
23. Description of Emissions Unit Addressed in This Section (limit to 60 characters): Cedarapids, Inc. Vibrating Screener – Vibrating Screener to Screener Discharge Conveying System (drop point from Vibrating Screener to Screener Discharge Conveying System)		
3. Emissions Unit Identification Number: ID: 004		<input type="checkbox"/> No ID <input type="checkbox"/> ID Unknown
24. Emissions Unit Status Code: ACTIVE	25. Initial Startup Date: UNKNOWN	26. Emissions Unit Major Group SIC Code: 14
27. Emissions Unit Comment: (Limit to 500 Characters): The fugitive emissions generated from this drop point where crushed material leaves the vibrating screener and is dropped onto the screened material discharge belt are controlled by the water spray bar system on a as needed basis, mounted in the area of the discharge pan / conveying system. This material is still moist enough as to cause little to no fugitive emissions at this drop point. This material is still moist from previous spray systems and is also dampened before it leaves the belt and drops to it's stockpile.		

Emissions Unit Information Section 4 of 9
Cedarapids Vibrating Screener
Emissions Unit Control Equipment

1. Control Equipment/Method Description (limit to 200 characters per device or method):

The fugitive emissions generated from this drop point where crushed material leaves the vibrating screener and is dropped onto the screened material discharge belt are controlled by the water spray bar system on a as needed basis, mounted in the area of the discharge pan / conveying system. This material is still moist enough as to cause little to no fugitive emissions at this drop point. This material is still moist from previous spray systems and is also dampened before it leaves the belt and drops to it's stockpile.

2. Control Device or Method Code(s): **061,099**

Emissions Unit Details

1. Package Unit: **VIBRATING SCREENER**

Manufacturer: **CEDARAPIDS**

Model Number: **RC5411**

2. Generator Nameplate Rating:

MW

3. Incinerator Information:

Dwell Temperature:

°F

Dwell Time:

seconds

Incinerator Afterburner Temperature:

°F

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:

mmBtu/hr

2. Maximum Incineration Rate:

lb/hr

tons/day

3. Maximum Process or Throughput Rate:

200 TPH AS RAW (UNCRUSHED)

RECLAIMED ASPHALT OR CONCRETE

4. Maximum Production Rate: **200 TPH AS RECLAIMED CRUSHED AND SCREENED**

ASPHALT (RAP) OR CONCRETE

5. Requested Maximum Operating Schedule:

10 hours/day

6 days/week

52 weeks/year

3120 hours/year

28. Operating Capacity/Schedule Comment (limit to 200 characters):

The fugitive emissions generated from this drop point where crushed material leaves the vibrating screener and is dropped onto the screened material discharge belt are controlled by the water spray bar system on a as needed basis, mounted in the area of the discharge pan / conveying system. This material is still moist enough as to cause little to no fugitive emissions at this drop point. This material is still moist from previous spray systems and is also dampened before it leaves the belt and drops to it's stockpile.

Emissions Unit Information Section 4 of 9
 Cedarapids Vibrating Screener

B. EMISSION POINT (STACK/VENT) INFORMATION

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? 004 (Vibrating Screener)		16. Emission Point Type Code: 4	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point): NONE			
17. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: NONE			
18. Discharge Type Code: F	6. Stack Height: feet	7. Exit Diameter: feet	
8. Exit Temperature: °F	9. Actual Volumetric Flow Rate: acfm	10. Water Vapor: %	
11. Maximum Dry Standard Flow Rate: dscfm		12. Nonstack Emission Point Height: ~10 FEET	
13. Emission Point UTM Coordinates: (Relocatable unit figures below are location now) Zone: 17 East (km): 357.8 North (km): 3107.2			
14. Emission Point Comment (limit to 200 characters): EMISSIONS POINT WILL BE FUGITIVE IF ANY EMISSIONS GENERATED AT ALL			

Emissions Unit Information Section 4 of 9

Cedarapids Vibrating Screener

C. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment _____ of _____

1. Segment Description (Process/Fuel Type) (limit to 500 characters): Cedarapids, Inc. – Portable Crushing Unit – Vibrating Screener to Screened Material Discharge Belt. (Material Handling - Emissions related to conveying of reclaimed crushed material). Portable Cone (Material Handling - Emissions related to dropping material out of screener onto belt.)		
5. Source Classification Code (SCC): 30502503		3. SCC Units: TONS OF PRODUCT PROCESSED
4. Maximum Hourly Rate: 200 tph	19. Maximum Annual Rate: 624,000 ton	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: NA	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters):		

Segment Description and Rate: Segment _____ of _____

1. Segment Description (Process/Fuel Type) (limit to 500 characters):		
2. Source Classification Code (SCC):		3. SCC Units:
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters):		

D. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION

Potential Emissions

1. Pollutant Emitted: PM, PM10		2. Pollutant Regulatory Code: WP	
3. Primary Control Device Code: 061	4. Secondary Control Device Code: 099	5. Total Percent Efficiency of Control: 80%	
6. Potential Emissions: PM10 = 0.96 lb/hr, 1.50 ton/yr PM = 2.02 lb/hr, 3.14 ton/yr		7. Synthetically Limited? [X]	
8. Emission Factor: 0.0048 lb/ton Reference: AP-42 (Table 11.19.2-2 controlled) and footnote © for PM Emissions		29. Emissions Method Code: 3	
10. Calculation of Emissions (limit to 600 characters): $PM10_{yearly} = [(200 \text{ ton/hr})(3120 \text{ hr/yr})(0.0048 \text{ lb/ton})] / (2000 \text{ lb/ton}) = 1.50 \text{ ton/yr}$ $PM10_{hour} = [(200 \text{ ton/hr})(0.0048 \text{ lb/ton})] = 0.96 \text{ lb/hr}$ $TSP_{yearly} = [(200 \text{ ton/hr})(3120 \text{ hr/yr})(0.0048 \text{ lb/ton})] (2.1) / (2000 \text{ lb/ton}) = 3.14 \text{ ton/yr}$ $TSP_{hour} = [(200 \text{ ton/hr})(0.0048 \text{ lb/ton})] (2.1) = 2.02 \text{ lb/hr}$			
11. Pollutant Potential Emissions Comment (limit to 200 characters): Vibrating Screener – subject to 40 CFR 60, subpart 000 rules and regulations.			

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code: 40 CFR 60, subpart 000	2. Future Effective Date of Allowable Emissions: Initial Compliance Test	
3. Requested Allowable Emissions and Units: < 10 % Opacity	4. Equivalent Allowable Emissions: lb/hour tons/year	
5. Method of Compliance (limit to 60 characters): Initial and Annual EPA Method 9 Compliance Testing		
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):		

**Emissions Unit Information Section 4 of 9
Cedarapids Vibrating Screener**

**E. VISIBLE EMISSIONS INFORMATION
(Only Emissions Units Subject to a VE Limitation)**

Visible Emissions Limitation: Visible Emissions Limitation _____ of _____

1. Visible Emissions Subtype: VE	2. Basis for Allowable Opacity: <input checked="" type="checkbox"/> Rule <input type="checkbox"/> Other
3. Requested Allowable Opacity: Normal Conditions: <10% Exceptional Conditions: <10% Maximum Period of Excess Opacity Allowed: 0 min/hour	
4. Method of Compliance: Initial and Annual Visible Emissions Compliance Testing.	
5. Visible Emissions Comment (limit to 200 characters):	

**F. CONTINUOUS MONITOR INFORMATION
(Only Emissions Units Subject to Continuous Monitoring)**

Continuous Monitoring System: Continuous Monitor _____ of _____

1. Parameter Code: NONE	2. Pollutant(s):
3. CMS Requirement:	<input type="checkbox"/> Rule <input type="checkbox"/> Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters):	

Emissions Unit Information Section 4 of 9
Cedarapids Vibrating Screener

G. EMISSIONS UNIT SUPPLEMENTAL INFORMATION

Supplemental Requirements

1. Process Flow Diagram <input checked="" type="checkbox"/> Attached, Document ID: <u>III</u> <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
2. Fuel Analysis or Specification <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
3. Detailed Description of Control Equipment <input checked="" type="checkbox"/> Attached, Document ID: <u>V</u> <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
4. Description of Stack Sampling Facilities <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
5. Compliance Test Report <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Previously submitted, Date: _____ <input checked="" type="checkbox"/> Not Applicable
6. Procedures for Startup and Shutdown <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
7. Operation and Maintenance Plan <input checked="" type="checkbox"/> Attached, Document ID: <u>VI</u> <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
8. Supplemental Information for Construction Permit Application <input checked="" type="checkbox"/> Attached, Document ID: <u>VII</u> <input type="checkbox"/> Not Applicable
9. Other Information Required by Rule or Statute <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
10. Supplemental Requirements Comment:

EMISSIONS ID. NO. 005

Emissions From Magnet Transfer Drop

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through G as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in This Section: (Check one)		
<input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).		
<input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.		
<input checked="" type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.		
30. Description of Emissions Unit Addressed in This Section (limit to 60 characters): Cedarapids, Inc. Magnet Transfer Point – Transfer Point where metal is extracted from oversized crushed material drops to a transfer belt to be run back through screener (drop point from magnet belt to transfer belt)		
3. Emissions Unit Identification Number: ID: 005		<input type="checkbox"/> No ID <input type="checkbox"/> ID Unknown
31. Emissions Unit Status Code: ACTIVE	32. Initial Startup Date: UNKNOWN	33. Emissions Unit Major Group SIC Code: 14
34. Emissions Unit Comment: (Limit to 500 Characters): The fugitive emissions generated from this drop point where crushed material leaves the magnet belt and is dropped onto a transfer belt to be rescreened. This material will be controlled by the water spray bar system on a as needed basis, mounted in the area of the discharge pan / conveying system. This material is still moist enough as to cause little to no fugitive emissions at this drop point. This material is still moist from previous spray systems and is also dampened before it leaves the belt and drops to it's stockpile.		

Emissions Unit Information Section 5 of 9
Cedarapids Magnet Transfer Point
Emissions Unit Control Equipment

1. Control Equipment/Method Description (limit to 200 characters per device or method):

The fugitive emissions generated from this drop point where crushed material leaves the magnet belt and is dropped onto the transfer belt is controlled by the water spray bar system on a as needed basis, mounted in the area of the discharge pan / conveying system. This material is still moist enough as to cause little to no fugitive emissions at this drop point. This material is still moist from previous spray systems and is also dampened before it leaves the belt and drops to it's stockpile.

2. Control Device or Method Code(s): **061,099**

Emissions Unit Details

1. Package Unit: **Magnet Transfer Point**

Manufacturer: **CEDARAPIDS**

Model Number: **RC5411**

2. Generator Nameplate Rating:

MW

3. Incinerator Information:

Dwell Temperature:

°F

Dwell Time:

seconds

Incinerator Afterburner Temperature:

°F

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:

mmBtu/hr

2. Maximum Incineration Rate:

lb/hr

tons/day

3. Maximum Process or Throughput Rate:

200 TPH AS RAW (UNCRUSHED)

RECLAIMED ASPHALT OR CONCRETE

4. Maximum Production Rate: **200 TPH AS RECLAIMED CRUSHED AND SCREENED**

ASPHALT (RAP) OR CONCRETE

5. Requested Maximum Operating Schedule:

10 hours/day

6 days/week

52 weeks/year

3120 hours/year

35. Operating Capacity/Schedule Comment (limit to 200 characters):

The fugitive emissions generated from this drop point where crushed material leaves the magnet belt is dropped onto the transfer material discharge belt are controlled by the water spray bar system on a as needed basis, mounted in the area of the discharge pan / conveying system. This material is still moist enough as to cause little to no fugitive emissions at this drop point. This material is still moist from previous spray systems and is also dampened before it leaves the belt and drops to it's stockpile.

Cedarapids Magnet Transfer Point

B. EMISSION POINT (STACK/VENT) INFORMATION

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? 005 (Magnet Trans. Pt.)		20. Emission Point Type Code: 4	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point): NONE			
21. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: NONE			
22. Discharge Type Code: F	6. Stack Height: feet	7. Exit Diameter: feet	
8. Exit Temperature: °F	9. Actual Volumetric Flow Rate: acfm	10. Water Vapor: %	
11. Maximum Dry Standard Flow Rate: dscfm		12. Nonstack Emission Point Height: ~4 FEET	
13. Emission Point UTM Coordinates: (Relocatable unit figures below are location now) Zone: 17 East (km): 357.8 North (km): 3107.2			
14. Emission Point Comment (limit to 200 characters): EMISSIONS POINT WILL BE FUGITIVE IF ANY EMISSIONS GENERATED AT ALL			

Cedarapids Magnet Transfer Point

C. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment _____ of _____

1. Segment Description (Process/Fuel Type) (limit to 500 characters): Cedarapids, Inc. – Portable Crushing Unit – Magnet Transfer Point. (Material Handling - Emissions related to conveying of reclaimed crushed material from one belt to another)		
6. Source Classification Code (SCC): 30502505		3. SCC Units: TONS OF PRODUCT PROCESSED
4. Maximum Hourly Rate: 200 tph	23. Maximum Annual Rate: 624,000 ton	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: NA	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters):		

Segment Description and Rate: Segment _____ of _____

1. Segment Description (Process/Fuel Type) (limit to 500 characters):		
2. Source Classification Code (SCC):		3. SCC Units:
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters):		

D. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION

Potential Emissions

1. Pollutant Emitted: PM, PM10		2. Pollutant Regulatory Code: WP	
3. Primary Control Device Code: 061	4. Secondary Control Device Code: 099	5. Total Percent Efficiency of Control: 80%	
6. Potential Emissions: PM10 = 0.96 lb/hr, 1.50 ton/yr PM = 2.02 lb/hr, 3.14 ton/yr		7. Synthetically Limited? [X]	
8. Emission Factor: 0.0021 lb/ton Reference: AP-42 (Table 11.19.2-2 controlled) and footnote © for PM Emissions		36. Emissions Method Code: 3	
10. Calculation of Emissions (limit to 600 characters): $PM10_{yearly} = [(200 \text{ ton/hr})(3120 \text{ hr/yr})(0.0048 \text{ lb/ton})] / (2000 \text{ lb/ton}) = 1.50 \text{ ton/yr}$ $PM10_{hour} = [(200 \text{ ton/hr})(0.0048 \text{ lb/ton})] = 0.96 \text{ lb/hr}$ $TSP_{yearly} = [(200 \text{ ton/hr})(3120 \text{ hr/yr})(0.0048 \text{ lb/ton})] (2.1) / (2000 \text{ lb/ton}) = 3.14 \text{ ton/yr}$ $TSP_{hour} = [(200 \text{ ton/hr})(0.0048 \text{ lb/ton})] (2.1) = 2.02 \text{ lb/hr}$			
11. Pollutant Potential Emissions Comment (limit to 200 characters): Magnet Transfer Point – subject to 40 CFR 60, subpart 000 rules and regulations.			

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code: 40 CFR 60, subpart 000	2. Future Effective Date of Allowable Emissions: Initial Compliance Test
3. Requested Allowable Emissions and Units: < 10 % Opacity	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters): Initial and Annual EPA Method 9 Compliance Testing	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

Magnet Transfer Point - Drop Point

E. VISIBLE EMISSIONS INFORMATION
(Only Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation _____ of _____

1. Visible Emissions Subtype: VE	2. Basis for Allowable Opacity: <input checked="" type="checkbox"/> Rule <input type="checkbox"/> Other
3. Requested Allowable Opacity: Normal Conditions: <10% Exceptional Conditions: <10% Maximum Period of Excess Opacity Allowed: 0 min/hour	
4. Method of Compliance: Initial and Annual Visible Emissions Compliance Testing.	
5. Visible Emissions Comment (limit to 200 characters):	

F. CONTINUOUS MONITOR INFORMATION
(Only Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor _____ of _____

1. Parameter Code: NONE	2. Pollutant(s):
3. CMS Requirement:	<input type="checkbox"/> Rule <input type="checkbox"/> Other
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters):	

Magnet Transfer Point - Drop Point

G. EMISSIONS UNIT SUPPLEMENTAL INFORMATION

Supplemental Requirements

1. Process Flow Diagram <input checked="" type="checkbox"/> Attached, Document ID: <u>III</u> <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
2. Fuel Analysis or Specification <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
3. Detailed Description of Control Equipment <input checked="" type="checkbox"/> Attached, Document ID: <u>V</u> <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
4. Description of Stack Sampling Facilities <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
5. Compliance Test Report <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Previously submitted, Date: _____ <input checked="" type="checkbox"/> Not Applicable
6. Procedures for Startup and Shutdown <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
7. Operation and Maintenance Plan <input checked="" type="checkbox"/> Attached, Document ID: <u>VI</u> <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
8. Supplemental Information for Construction Permit Application <input checked="" type="checkbox"/> Attached, Document ID: <u>VII</u> <input type="checkbox"/> Not Applicable
9. Other Information Required by Rule or Statute <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
10. Supplemental Requirements Comment:

EMISSIONS ID. NO. 006

Emissions From Radial Stacker Belt

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through G as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in This Section: (Check one)		
<input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).		
<input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.		
<input checked="" type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.		
2. Description of Emissions Unit Addressed in This Section (limit to 60 characters):		
Drop Point from Radial Stacker No.1 to Stockpile – where crushed material leaves radial stacker belt to stockpile		
3. Emissions Unit Identification Number: <input type="checkbox"/> No ID ID: 006		
37. Emissions Unit Status Code: ACTIVE	38. Initial Startup Date: UNKNOWN	39. Emissions Unit Major Group SIC Code: 14
40. Emissions Unit Comment: (Limit to 500 Characters):		
<p>CRUSHED RECLAIMED ASPHALT & CONCRETE WILL TRAVEL ALONG THE RADIAL STACKER BELT TO BE STOCKPILED FOR FUTURE USE AT CONSTRUCTION SITES. THE ENTIRE AGGREGATE PROCESSING UNIT WILL CRUSH AND AND CONVEY RECLAIMED ASPHALT & CONCRETE, THEREFORE EMISSIONS WILL BE NIL TO NONE FROM THIS EMISSIONS UNIT. SHOULD ANY OCCUR THE MATERIAL WILL BE SPRAYED AS TO CONTROL ANY EMISSIONS GENERATED.</p>		

Emissions Unit Information Section 6 of 9

Radial Stacker Belt – Drop Point

Emissions Unit Control Equipment

24. Control Equipment/Method Description (limit to 200 characters per device or method):

ANY EMISSIONS THAT MAY BE GENERATED UNIT ARE CONTROLLED AT THIS FACILITY BY DAMPENING MATERIAL BEFORE IT ENTERS THE RECEIVING HOPPER AS NEEDED TO CONTROL GENERATION OF FUGITIVES

2. Control Device or Method Code(s): **061,099**

Emissions Unit Details

1. Package Unit: RADIAL STACKER BELT	Model Number: NA
Manufacturer: SELF FABRICATED	
2. Generator Nameplate Rating:	MW
3. Incinerator Information:	
Dwell Temperature:	°F
Dwell Time:	seconds
Incinerator Afterburner Temperature:	°F

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:	mmBtu/hr
2. Maximum Incineration Rate:	lb/hr tons/day
3. Maximum Process or Throughput Rate:	200 TPH AS RAW (UNCRUSHED) RECLAIMED ASPHALT OR CONCRETE
4. Maximum Production Rate:	200 TPH AS RECLAIMED CRUSHED AND SCREENED ASPHALT (RAP) OR CONCRETE
5. Requested Maximum Operating Schedule:	
10 hours/day	6 days/week
52 weeks/year	3120 hours/year

41. Operating Capacity/Schedule Comment (limit to 200 characters):

Dampened, uncrushed reclaimed asphalt material is fed into the crusher from the receiving hopper and grizzly feeder of the plant where it is crushed and discharged to the discharge pan where it fall onto a conveyor belt from there it is conveyed to a stockpile for future use at one of the asphalt plants. Any fugitive emissions generated are controlled by dampening of the material before it enters the grizzly feeder and crusher as needed.

Radial Stacker Belt – Drop Point

B. EMISSION POINT (STACK/VENT) INFORMATION

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? 006 (Radial Stacker)		25. Emission Point Type Code: 4	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point): NONE			
26. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: NONE			
27. Discharge Type Code: F	6. Stack Height: feet	7. Exit Diameter: feet	
8. Exit Temperature: °F	9. Actual Volumetric Flow Rate: acfm	10. Water Vapor: %	
11. Maximum Dry Standard Flow Rate: dscfm		12. Nonstack Emission Point Height: ~2-15 FEET	
13. Emission Point UTM Coordinates: (portable facility – figure below at location now) Zone: 17 East (km): 357.8 North (km): 3107.2			
14. Emission Point Comment (limit to 200 characters): EMISSIONS POINT WILL BE FUGITIVE IF ANY EMISSIONS GENERATED AT ALL			

Emissions Unit Information Section 6 of 9

Radial Stacker Belt - Drop Point

C. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment _____ of _____

1. Segment Description (Process/Fuel Type) (limit to 500 characters): Cedarapids - Radial Stacker Belt to Stockpile (Material Handling - Emissions related to conveying and dropping of material.)		
7. Source Classification Code (SCC): 30502511		3. SCC Units: TONS OF PRODUCT PROCESSED
4. Maximum Hourly Rate: 200 tph	28. Maximum Annual Rate: 624,000 ton	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: NA	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters):		

Segment Description and Rate: Segment _____ of _____

1. Segment Description (Process/Fuel Type) (limit to 500 characters):		
2. Source Classification Code (SCC):		3. SCC Units:
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters):		

**EMISSIONS UNIT NO. 6 of 9
RADIAL STACKER BELT**

D. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION

Potential Emissions

1. Pollutant Emitted: PM, PM10		2. Pollutant Regulatory Code: WP	
3. Primary Control Device Code: 061	4. Secondary Control Device Code: 099	5. Total Percent Efficiency of Control: 80%	
6. Potential Emissions: PM10 = 0.96 lb/hr & 1.50 ton/hr PM = 2.02 lb/hr & 3.14 ton/hr		7. Synthetically Limited? [X]	
8. Emission Factor: 0.0048 lb/ton Reference: AP-42 (Table 11.19.2-2 controlled) and footnote © for PM Emissions		42. Emissions Method Code: 3	
10. Calculation of Emissions (limit to 600 characters): $PM10 = (200 \text{ lb/ton})(0.0048 \text{ lb/ton}) = 0.96 \text{ lb/hr}$ $PM10_{\text{yearly}} [(200 \text{ lb/hr})(3120 \text{ hr/yr})(0.0048 \text{ lb/ton})] / 2000 \text{ lb/ton} = 1.50 \text{ ton/yr}$ $PM = [(200 \text{ lb/ton})(0.0048 \text{ lb/ton})] (2.1) = 2.02 \text{ lb/hr}$ $PM10_{\text{yearly}} [(200 \text{ lb/hr})(3120 \text{ hr/yr})(0.0048 \text{ lb/ton})] / 2000 \text{ lb/ton} (2.1) = 3.14 \text{ ton/yr}$			
11. Pollutant Potential Emissions Comment (limit to 200 characters): Radial Stacker Belt – subject to 40 CFR 60, subpart 000 rules and regulations.			

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code: 40 CFR 60, subpart 000	2. Future Effective Date of Allowable Emissions: Initial Compliance Test
3. Requested Allowable Emissions and Units: < 10 % Opacity	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters): Initial and Annual EPA Method 9 Compliance Testing	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

EMISSIONS UNIT NO. 6 of 9
RADIAL STACKER BELT

E. VISIBLE EMISSIONS INFORMATION
(Only Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation _____ of _____

1. Visible Emissions Subtype: VE	2. Basis for Allowable Opacity: <input checked="" type="checkbox"/> Rule <input type="checkbox"/> Other
3. Requested Allowable Opacity: Normal Conditions: <10% Exceptional Conditions: <10% Maximum Period of Excess Opacity Allowed: 0 min/hour	
4. Method of Compliance: Initial and Annual Visible Emissions Compliance Testing.	
5. Visible Emissions Comment (limit to 200 characters):	

F. CONTINUOUS MONITOR INFORMATION
(Only Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor _____ of _____

1. Parameter Code: NONE	2. Pollutant(s):
3. CMS Requirement:	<input type="checkbox"/> Rule <input type="checkbox"/> Other
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters):	

**EMISSIONS UNIT NO. 6 of 9
RADIAL STACKER BELT**

G. EMISSIONS UNIT SUPPLEMENTAL INFORMATION

Supplemental Requirements

1. Process Flow Diagram <input checked="" type="checkbox"/> Attached, Document ID: <u>III</u> [] Not Applicable [] Waiver Requested
2. Fuel Analysis or Specification [] Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable [] Waiver Requested
3. Detailed Description of Control Equipment <input checked="" type="checkbox"/> Attached, Document ID: <u>V</u> [] Not Applicable [] Waiver Requested
4. Description of Stack Sampling Facilities [] Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable [] Waiver Requested
5. Compliance Test Report [] Attached, Document ID: _____ [] Previously submitted, Date: _____ <input checked="" type="checkbox"/> Not Applicable
6. Procedures for Startup and Shutdown [] Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable [] Waiver Requested
7. Operation and Maintenance Plan <input checked="" type="checkbox"/> Attached, Document ID: <u>VI</u> [] Not Applicable [] Waiver Requested
8. Supplemental Information for Construction Permit Application <input checked="" type="checkbox"/> Attached, Document ID: <u>VII</u> [] Not Applicable
9. Other Information Required by Rule or Statute [] Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
10. Supplemental Requirements Comment:

EMISSIONS ID. NO. 007

Emissions From Caterpillar Generator Set

**EMISSIONS UNIT NO. 7 of 9
DIESEL GENERATOR SET**

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through G as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION

Emissions Unit Description and Status

<p>1. Type of Emissions Unit Addressed in This Section: (Check one)</p> <p><input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).</p> <p><input checked="" type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.</p> <p><input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.</p>		
<p>2. Description of Emissions Unit Addressed in This Section (limit to 60 characters): Caterpillar Diesel fired Generator Set used to supply electrical power to the crushing / aggregate processing plant. Generator fired on No.2 virgin diesel fuel oil with a maximum sulfur content of 0.5% by weight, ~138,000 Btu/gal and a maximum fuel consumption of 25 gal/hr.</p>		
<p>3. Emissions Unit Identification Number: ID: 007</p>		<p><input type="checkbox"/> No ID <input type="checkbox"/> ID Unknown</p>
<p>43. Emissions Unit Status Code: ACTIVE</p>	<p>44. Initial Startup Date: UNKNOWN</p>	<p>45. Emissions Unit Major Group SIC Code: 14</p>
<p>46. Emissions Unit Comment: (Limit to 500 Characters): 325 H.P. Caterpillar Diesel Generator – fired on No.2 virgin diesel fuel with a maximum sulfur limit of 0.5% by weight – used to power all equipment employed by this crushing/aggregate processing unit.</p>		

**EMISSIONS UNIT NO. 7 of 9
DIESEL GENERATOR SET**

Emissions Unit Control Equipment

29. Control Equipment/Method Description (limit to 200 characters per device or method): NONE
2. Control Device or Method Code(s): NA

Emissions Unit Details

1. Package Unit: Generator Set Manufacturer: Caterpillar Diesel Model Number: 325
2. Generator Nameplate Rating: MW
3. Incinerator Information: Dwell Temperature: °F Dwell Time: seconds Incinerator Afterburner Temperature: °F

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate: 6.21 mmBtu/hr
2. Maximum Incineration Rate: lb/hr tons/day
3. Maximum Process or Throughput Rate: Consumes No.2 fuel oil at a maximum rate of 25 gal/hr
4. Maximum Production Rate: 25 gal/hr
5. Requested Maximum Operating Schedule: 10 hours/day 6 days/week 52 weeks/year 3120 hours/year
47. Operating Capacity/Schedule Comment (limit to 200 characters): 325 H.P. Caterpillar Diesel Generator – fired on No.2 virgin diesel fuel with a maximum sulfur limit of 0.5% by weight – used to power all equipment employed by this crushing/aggregate processing unit.

**EMISSIONS UNIT NO. 7 of 9
DIESEL GENERATOR SET**

B. EMISSION POINT (STACK/VENT) INFORMATION

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? 007 (Generator)		30. Emission Point Type Code: 4	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point): NONE			
31. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: NONE			
32. Discharge Type Code: F	6. Stack Height: feet	7. Exit Diameter: feet	
8. Exit Temperature: °F	9. Actual Volumetric Flow Rate: acfm	10. Water Vapor: %	
11. Maximum Dry Standard Flow Rate: dscfm		12. Nonstack Emission Point Height: ~12 FEET	
13. Emission Point UTM Coordinates: (portable unit at this location only) Zone: 17 East (km): 357.8 North (km): 3107.2			
14. Emission Point Comment (limit to 200 characters):			

**EMISSIONS UNIT NO. 7 of 9
DIESEL GENERATOR SET**

C. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment ____ of ____

1. Segment Description (Process/Fuel Type) (limit to 500 characters): Caterpillar Diesel Generator Set – Emissions from Detroit Diesel Generator fired on No.2 virgin diesel fuel with a maximum sulfur limit of 0.5% by weight.		
8. Source Classification Code (SCC): 20222200401		3. SCC Units: 1000 gallons burned
4. Maximum Hourly Rate: 25 ga/hr @ worst case	33. Maximum Annual Rate: 78,000 gal/yr @ max.	6. Estimated Annual Activity Factor: 0.50 tpy @ worst
7. Maximum % Sulfur: 0.5%	8. Maximum % Ash: ≤ 0.01 % by weight	9. Million Btu per SCC Unit: 138,000
10. Segment Comment (limit to 200 characters):		

Segment Description and Rate: Segment ____ of ____

1. Segment Description (Process/Fuel Type) (limit to 500 characters):		
2. Source Classification Code (SCC):		3. SCC Units:
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters):		

**EMISSIONS UNIT NO. 7 of 9
DIESEL GENERATOR SET**

D. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION

Potential Emissions **Pollutant 1 of 5**

1. Pollutant Emitted: PM10		2. Pollutant Regulatory Code: WP	
3. Primary Control Device Code:	4. Secondary Control Device Code: NONE	5. Total Percent Efficiency of Control: 0%	
6. Potential Emissions: : PM10 = 1.07 lb/hr or 1.67 ton/yr		7. Synthetically Limited? [X]	
8. Emission Factor: 0.31 lb/MMBTU Reference: AP-42		48. Emissions Method Code: 3	
10. Calculation of Emissions (limit to 600 characters): $\text{PM10} = (25 \text{ gal/hr fuel usage})(138,000 \text{ BTU/gal}) = 3.45 \text{ MMBTU/hr}$ $(3.45 \text{ MMBTU/hr})(0.31 \text{ lb/MMBTU}) = 1.07 \text{ lb/hr}$ $(1.07 \text{ lb/hr})(3120 \text{ hrs/yr}) / 2000 \text{ lb/ton} = 1.67 \text{ ton/hr}$			
11. Pollutant Potential Emissions Comment (limit to 200 characters): Emissions from Diesel Generator Subject to 62-296.320 FAC			

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code: 40 CFR 60, subpart 000	2. Future Effective Date of Allowable Emissions: Initial Compliance Test
3. Requested Allowable Emissions and Units: < 10 % Opacity	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters): Initial and Annual EPA Method 9 Compliance Testing	
6. Allowable Emissions Comment (Desc. Of Operating Method) (limit to 200 characters):	

**EMISSIONS UNIT NO. 7 of 9
DIESEL GENERATOR SET**

D. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION

Potential Emissions Pollutant 2 of 5

1. Pollutant Emitted: NOx		2. Pollutant Regulatory Code: WP	
3. Primary Control Device Code:	4. Secondary Control Device Code: NONE	5. Total Percent Efficiency of Control: 0%	
6. Potential Emissions: : NOx = 15.21 lb/hr or 23.73 ton/yr		7. Synthetically Limited? [X]	
8. Emission Factor: 4.41 lb/MMBTU Reference: AP-42		49. Emissions Method Code: 3	
10. Calculation of Emissions (limit to 600 characters): $\text{NOx} = (25 \text{ gal/hr fuel useage})(138,000 \text{ BTU/gal}) = 3.45 \text{ MMBTU/hr}$ $(3.45 \text{ MMBTU/hr})(4.41 \text{ lb/MMBTU}) = 15.21 \text{ lb/hr}$ $(15.21 \text{ lb/hr})(3120 \text{ hrs/yr}) / 2000 \text{ lb/ton} = 23.73 \text{ ton/yr}$			
11. Pollutant Potential Emissions Comment (limit to 200 characters): Emissions from Diesel Generator Subject to 62-296.320 FAC			

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code: 62-296.320 of FAC	2. Future Effective Date of Allowable Emissions: Initial Compliance Test
3. Requested Allowable Emissions and Units: < 10 % Opacity	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters): Initial and Annual EPA Method 9 Compliance Testing	
6. Allowable Emissions Comment (Desc. Of Operating Method) (limit to 200 characters):	

**EMISSIONS UNIT NO. 7 of 9
DIESEL GENERATOR SET**

D. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION

Potential Emissions **Pollutant 3 of 5**

1. Pollutant Emitted: CO		2. Pollutant Regulatory Code: WP	
3. Primary Control Device Code:	4. Secondary Control Device Code: NONE		5. Total Percent Efficiency of Control: 0%
6. Potential Emissions: : CO = 3.28 lb/hr or 5.12 ton/yr			7. Synthetically Limited? [X]
8. Emission Factor: 0.95 lb/MMBTU Reference: AP-42			50. Emissions Method Code: 3
10. Calculation of Emissions (limit to 600 characters): $CO = (25 \text{ gal/hr fuel usage})(138,000 \text{ BTU/gal}) = 3.45 \text{ MMBTU/hr}$ $(3.45 \text{ MMBTU/hr})(0.95 \text{ lb/MMBTU}) = 3.28 \text{ lb/hr}$ $(3.28 \text{ lb/hr})(3120 \text{ hrs/yr}) / 2000 \text{ lb/ton} = 5.12 \text{ ton/hr}$			
11. Pollutant Potential Emissions Comment (limit to 200 characters): Emissions from Diesel Generator Subject to 62-296.320 FAC			

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code: 62-296.320 FAC	2. Future Effective Date of Allowable Emissions: Initial Compliance Test		
3. Requested Allowable Emissions and Units: < 20% Opacity	4. Equivalent Allowable Emissions: lb/hour tons/year		
5. Method of Compliance (limit to 60 characters): Initial and Annual EPA Method 9 Compliance Testing			
6. Allowable Emissions Comment (Desc. Of Operating Method) (limit to 200 characters):			

**EMISSIONS UNIT NO. 7 of 9
DIESEL GENERATOR SET**

D. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION

Potential Emissions Pollutant 4 of 5

1. Pollutant Emitted: SOx		2. Pollutant Regulatory Code: WP	
3. Primary Control Device Code:	4. Secondary Control Device Code: NONE	5. Total Percent Efficiency of Control: 0%	
6. Potential Emissions: : SOx = 1.00 lb/hr or 1.56 ton/yr		7. Synthetically Limited? [X]	
8. Emission Factor: 0.29 lb/MMBTU Reference: AP-42		51. Emissions Method Code: 3	
10. Calculation of Emissions (limit to 600 characters): $\text{SOx} = (25 \text{ gal/hr fuel useage})(138,000 \text{ BTU/gal}) = 3.45 \text{ MMBTU/hr}$ $(3.45 \text{ MMBTU/hr})(0.29 \text{ lb/MMBTU}) = 1.00 \text{ lb/hr}$ $(1.00 \text{ lb/hr})(3120 \text{ hrs/yr}) / 2000 \text{ lb/ton} = 1.56 \text{ ton/hr}$			
11. Pollutant Potential Emissions Comment (limit to 200 characters): Emissions from Diesel Generator Subject to 62-296.320 FAC			

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code: 62-296.320 FAC	2. Future Effective Date of Allowable Emissions: Initial Compliance Test
3. Requested Allowable Emissions and Units: < 20% Opacity	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters): Initial and Annual EPA Method 9 Compliance Testing	
6. Allowable Emissions Comment (Desc. Of Operating Method) (limit to 200 characters):	

**EMISSIONS UNIT NO. 7 of 9
DIESEL GENERATOR SET**

D. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION

Potential Emissions Pollutant 5 of 5

1. Pollutant Emitted: TOC		2. Pollutant Regulatory Code: WP	
3. Primary Control Device Code:	4. Secondary Control Device Code: NONE	5. Total Percent Efficiency of Control: 0%	
6. Potential Emissions: : TOC = 1.24 lb/hr or 1.93 ton/yr		7. Synthetically Limited? [X]	
8. Emission Factor: 0.36 lb/MMBTU Reference: AP-42		52. Emissions Method Code: 3	
10. Calculation of Emissions (limit to 600 characters): $\text{TOC} = (25 \text{ gal/hr fuel useage})(138,000 \text{ BTU/gal}) = 3.45 \text{ MMBTU/hr}$ $(3.45 \text{ MMBTU/hr})(0.36 \text{ lb/MMBTU}) = 1.24 \text{ lb/hr}$ $(1.24 \text{ lb/hr})(3120 \text{ hrs/yr}) / 2000 \text{ lb/ton} = 1.93 \text{ ton/hr}$			
11. Pollutant Potential Emissions Comment (limit to 200 characters): Emissions from Diesel Generator Subject to 62-296.320 FAC			

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code: 62-296.320 FAC		2. Future Effective Date of Allowable Emissions: Initial Compliance Test	
3. Requested Allowable Emissions and Units: < 20% Opacity		4. Equivalent Allowable Emissions: lb/hour tons/year	
5. Method of Compliance (limit to 60 characters): Initial and Annual EPA Method 9 Compliance Testing			
6. Allowable Emissions Comment (Desc. Of Operating Method) (limit to 200 characters):			

**EMISSIONS UNIT NO. 7 of 9
DIESEL GENERATOR SET**

**E. VISIBLE EMISSIONS INFORMATION
(Only Emissions Units Subject to a VE Limitation)**

Visible Emissions Limitation: Visible Emissions Limitation _____ of _____

1. Visible Emissions Subtype: VE	2. Basis for Allowable Opacity: <input checked="" type="checkbox"/> Rule <input type="checkbox"/> Other
3. Requested Allowable Opacity: Normal Conditions: <20% Exceptional Conditions: <10% Maximum Period of Excess Opacity Allowed: 0 min/hour	
4. Method of Compliance: Initial and Annual Visible Emissions Compliance Testing.	
5. Visible Emissions Comment (limit to 200 characters): Visible Emissions from Diesel Generator are subject to 62-296.320 FAC	

**F. CONTINUOUS MONITOR INFORMATION
(Only Emissions Units Subject to Continuous Monitoring)**

Continuous Monitoring System: Continuous Monitor _____ of _____

1. Parameter Code: NONE	2. Pollutant(s):
3. CMS Requirement:	<input type="checkbox"/> Rule <input type="checkbox"/> Other
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters):	

EMISSIONS UNIT NO. 7 of 9
DIESEL GENERATOR SET

G. EMISSIONS UNIT SUPPLEMENTAL INFORMATION

Supplemental Requirements

1. Process Flow Diagram <input checked="" type="checkbox"/> Attached, Document ID: <u>III</u> [] Not Applicable [] Waiver Requested
2. Fuel Analysis or Specification <input checked="" type="checkbox"/> Attached, Document ID: <u>VII</u> [] Not Applicable [] Waiver Requested can be found in supplemental section of application
3. Detailed Description of Control Equipment <input checked="" type="checkbox"/> Attached, Document ID: <u>V</u> [] Not Applicable [] Waiver Requested
4. Description of Stack Sampling Facilities [] Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable [] Waiver Requested
5. Compliance Test Report [] Attached, Document ID: _____ [] Previously submitted, Date: _____ <input checked="" type="checkbox"/> Not Applicable
6. Procedures for Startup and Shutdown [] Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable [] Waiver Requested
7. Operation and Maintenance Plan <input checked="" type="checkbox"/> Attached, Document ID: <u>VI</u> [] Not Applicable [] Waiver Requested
8. Supplemental Information for Construction Permit Application <input checked="" type="checkbox"/> Attached, Document ID: <u>VII</u> [] Not Applicable
9. Other Information Required by Rule or Statute [] Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
10. Supplemental Requirements Comment:

EMISSIONS ID. NO. 008

Emissions From Paved / Unpaved Roads

III. EMISSIONS UNIT INFORMATION

FUGITIVE EMISSIONS FROM PAVED & UNPAVED AREAS

A separate Emissions Unit Information Section (including subsections A through G as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION

Emissions Unit Description and Status

<p>1. Type of Emissions Unit Addressed in This Section: (Check one)</p> <p>[] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).</p> <p>[] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.</p> <p>[X] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.</p>		
<p>2. Description of Emissions Unit Addressed in This Section (limit to 60 characters):</p> <p>Fugitive emissions from paved and unpaved areas -- worst case scenario. All paved and unpaved areas and aggregate piles at this facility as well as other locations will be kept damp on a as needed basis.</p>		
<p>3. Emissions Unit Identification Number: [] No ID</p> <p>ID: 004 [] ID Unknown</p>		
<p>1. Emissions Unit Status Code:</p> <p>NA</p>	<p>2. Initial Startup Date:</p> <p>ASAP</p>	<p>3. Emissions Unit Major Group SIC Code:</p> <p>2951</p>
<p>4. Emissions Unit Comment: (Limit to 500 Characters):</p> <p><i>Fugitive emissions from paved and unpaved areas – worst case scenario. All paved and unpaved areas and aggregate piles at this facility and other locations will be kept damp on a as needed basis.</i></p>		

Emissions Unit Information Section 8 of 9

Emissions Unit Control Equipment

1. Control Equipment/Method Description (limit to 200 characters per device or method):

All unpaved roadways at this facility and other locations are and will be kept damp by water truck and sprinker system on a as needed basis. Vehicular traffic speed will be posted and enforced at a maximum of 5 m.p.h. at all locations.

2. Control Device or Method Code(s): **099**

Emissions Unit Details

1. Package Unit: **NA**

Manufacturer: Model Number:

2. Generator Nameplate Rating: **MW**

3. Incinerator Information:

Dwell Temperature: °F

Dwell Time: seconds

Incinerator Afterburner Temperature: °F

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:

2. Maximum Incineration Rate: lb/hr tons/day

3. Maximum Process or Throughput Rate:

4. Maximum Production Rate:

5. Requested Maximum Operating Schedule:

24 hours/day 7 days/week

52 weeks/year not to exceed: 4000 hrs/year

6. Operating Capacity/Schedule Comment (limit to 200 characters):

Vehicular traffic at this facility will not be continuous 24 hrs/day

Emissions Unit Information Section 8 of 9

B. EMISSION POINT (STACK/VENT) INFORMATION

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? 004 – Unpaved/Paved Areas		2. Emission Point Type Code: 4	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point): NA – Fugitive Emission Point			
3. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: NOT APPLICABLE			
4. Discharge Type Code: F	6. Stack Height: ~ 0.0 feet	7. Exit Diameter: Not Determinable feet	
8. Exit Temperature: ~Ambient °F	9. Actual Volumetric Flow Rate: Unknown	10. Water Vapor: ~5 %	
11. Maximum Dry Standard Flow Rate: dscfm		12. Nonstack Emission Point Height: feet	
13. Emission Point UTM Coordinates: (@ present location, other locations UTM not determined as of yet.) Zone: 17 East (km): 357.8 E North (km): 3107.2 N			
14. Emission Point Comment (limit to 200 characters): This emission point subject to 62-296.310 FAC Rules and Regulations.			

Emissions Unit Information Section 8 of 9

C. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type) (limit to 500 characters): Fugitive emissions from paved, unpaved roads and stockpiles (Material Handling) emissions related to silt content on roadways and vehicular traffic in facility. Worst case scenario.		
2. Source Classification Code (SCC): 3050204		3. SCC Units: Vehicle Miles Traveled
4. Maximum Hourly Rate: NA	5. Maximum Annual Rate: NA	6. Estimated Annual Activity Factor: NA
6. Maximum % Sulfur: NA	7. Maximum % Ash: NA	8. Million Btu per SCC Unit: NA
10. Segment Comment (limit to 200 characters): FUGITIVE EMISSIONS CALCULATED AT WORST CASE SCENARIO		

Segment Description and Rate: Segment of

1. Segment Description (Process/Fuel Type) (limit to 500 characters):		
2. Source Classification Code (SCC):		3. SCC Units:
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters):		

Emissions Unit Information Section 8 of 9

D. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION

Potential Emissions

1. Pollutant Emitted: PM10, TSP		2. Pollutant Regulatory Code: EL	
3. Primary Control Device Code: 099	4. Secondary Control Device Code:	5. Total Percent Efficiency of Control: 90.0%	
6. Potential Emissions: PM10 : 1.0 lb/hr, 1.67 ton/yr TSP: 2.1 lb/hour 3.28 tons/year		7. Synthetically Limited? <input checked="" type="checkbox"/> YES	
8. Emission Factor: 0.24 lb/VMT Reference: AP-42 (Section 13.2.1.1) unpaved roads		9. Emissions Method Code: 3	
10. Calculation of Emissions (limit to 600 characters): $E = k(5.9)[s/12][S/30][W/3]^{0.7}[w/4]^{0.5}[365-P/365]$ $E = 0.36(5.9)[8.9/12][5/30][31.3/3]^{0.7}[10/4]^{0.5}[365-120/365] = 2.0 \text{ lb/VMT}$ $E = 2.0 \text{ lb/VMT (1-0.90 control efficiency from water truck) = 0.2 lb/VMT}$ $E_{\text{daily}} = (0.2 \text{ lb/VMT})(50 \text{ VMT/day}) = 10.0 \text{ lb/day}$ $E_{\text{year}} = [(10.0 \text{ lb/day}) / (\sim 12 \text{ hr/day}) (4000 \text{ hr/yr}) / 2000 \text{ lb/ton} = 1.67 \text{ ton/yr}$			
11. Pollutant Potential Emissions Comment (limit to 200 characters):			

Allowable Emissions Allowable Emissions 1 of 7

3. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: NA
4. Requested Allowable Emissions and Units: <10% Opacity	5. Equivalent Allowable Emissions: PM10 = 1.0 lb/hr, 1.67 ton/hr TSP = 2.10 lb/hour, 3.28 tons/year
5. Method of Compliance (limit to 60 characters): Compliance will be achieved through initial and annual emissions compliance testing. Watering of roadways and stockpiles will be performed as to control fugitive emissions at all locations.	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

Emissions Unit Information Section 8 of 9

**E. VISIBLE EMISSIONS INFORMATION
(Only Emissions Units Subject to a VE Limitation)**

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: VE10	2. Basis for Allowable Opacity: <input checked="" type="checkbox"/> Rule <input type="checkbox"/> Other
3. Requested Allowable Opacity: Normal Conditions: 10 % Exceptional Conditions: 10 % Maximum Period of Excess Opacity Allowed: NONE min/hour	
4. Method of Compliance: EPA METHOD 9	
5. Visible Emissions Comment (limit to 200 characters): Regulated under 62-296.320	

**F. CONTINUOUS MONITOR INFORMATION
(Only Emissions Units Subject to Continuous Monitoring)**

Continuous Monitoring System: Continuous Monitor _____ of _____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	<input type="checkbox"/> Rule <input type="checkbox"/> Other
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): NOT APPLICABLE	

G. EMISSIONS UNIT SUPPLEMENTAL INFORMATION

Supplemental Requirements

1. Process Flow Diagram <input checked="" type="checkbox"/> Attached, Document ID: <u>I</u> <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
2. Fuel Analysis or Specification <input checked="" type="checkbox"/> Attached, Document ID: <u>V</u> <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested Can be found in supplemental information section of application
3. Detailed Description of Control Equipment <input checked="" type="checkbox"/> Attached, Document ID: <u>VI</u> <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
4. Description of Stack Sampling Facilities <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
5. Compliance Test Report <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Previously submitted, Date: _____ <input checked="" type="checkbox"/> Not Applicable
6. Procedures for Startup and Shutdown <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
7. Operation and Maintenance Plan <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
8. Supplemental Information for Construction Permit Application <input checked="" type="checkbox"/> Attached, Document ID: <u>V</u> <input type="checkbox"/> Not Applicable
9. Other Information Required by Rule or Statute <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable
10. Supplemental Requirements Comment:

EMISSIONS ID. NO. 009

Emissions From Stock and Storage Piles

III. EMISSIONS UNIT INFORMATION

FUGITIVE EMISSIONS FROM AGGREGATE STORAGE PILES

A separate Emissions Unit Information Section (including subsections A through G as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION

Emissions Unit Description and Status

<p>1. Type of Emissions Unit Addressed in This Section: (Check one)</p> <p><input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).</p> <p><input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.</p> <p><input checked="" type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.</p>		
<p>6. Description of Emissions Unit Addressed in This Section (limit to 60 characters):</p> <p>Fugitive emissions from paved and unpaved areas – worst case scenario. All paved and unpaved areas and aggregate piles at this facility and other locations will be kept damp on a as needed basis.</p>		
<p>3. Emissions Unit Identification Number: ID: 005</p>		<p><input type="checkbox"/> No ID <input type="checkbox"/> ID Unknown</p>
<p>5. Emissions Unit Status Code: NA</p>	<p>6. Initial Startup Date: ASAP</p>	<p>7. Emissions Unit Major Group SIC Code: 2951</p>
<p>8. Emissions Unit Comment: (Limit to 500 Characters): <i>Fugitive emissions from Aggregate Handling – worst case scenario. All aggregate piles at this facility and other locations will be kept damp on a as needed basis.</i></p>		

Emissions Unit Information Section 9 of 9

Emissions Unit Control Equipment

5. Control Equipment/Method Description (limit to 200 characters per device or method): All aggregate stockpiles at this facility and other locations will be kept damp by water truck and sprinker system on a as needed basis.
2. Control Device or Method Code(s): 099

Emissions Unit Details

1. Package Unit: NA Manufacturer: Model Number:
2. Generator Nameplate Rating: MW
3. Incinerator Information: Dwell Temperature: °F Dwell Time: seconds Incinerator Afterburner Temperature: °F

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:
2. Maximum Incineration Rate: lb/hr tons/day
3. Maximum Process or Throughput Rate:
4. Maximum Production Rate:
7. Requested Maximum Operating Schedule: 24 hours/day 7 days/week 52 weeks/year not to exceed: 4000 hrs/year
8. Operating Capacity/Schedule Comment (limit to 200 characters): Aggregate Handling at this facility will not be continuous 24 hrs/day

Emissions Unit Information Section 9 of 9

B. EMISSION POINT (STACK/VENT) INFORMATION

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? 005 – Conveyor Drops, Loader Operations		6. Emission Point Type Code: 4	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point): NA – Fugitive Emission Point			
7. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: NOT APPLICABLE			
8. Discharge Type Code: F	6. Stack Height: ~ 0.0 feet	7. Exit Diameter: Not Determinable feet	
8. Exit Temperature: ~Ambient °F	9. Actual Volumetric Flow Rate: Unknown	10. Water Vapor: ~5 %	
11. Maximum Dry Standard Flow Rate: dscfm		12. Nonstack Emission Point Height: feet	
13. Emission Point UTM Coordinates: (@ present location. UTM's for other locations have not been determined as of yet) Zone: 17 East (km): 362.2 E North (km): 3004.0 N			
14. Emission Point Comment (limit to 200 characters): This emission point subject to 62-296.310 FAC Rules and Regulations.			

Emissions Unit Information Section 9 of 9

C. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type) (limit to 500 characters): Fugitive emissions from aggregate stockpiles and conveyor belts (Material Handling) emissions related to fugitives from conveyor belt drops and from aggregate storage piles from prevailing winds.		
12. Source Classification Code (SCC): 3050207, 3050205		13. SCC Units: Area of stockpiles / tons of products
14. Maximum Hourly Rate: NA	15. Maximum Annual Rate: NA	6. Estimated Annual Activity Factor: NA
16. Maximum % Sulfur: NA	17. Maximum % Ash: NA	18. Million Btu per SCC Unit: NA
10. Segment Comment (limit to 200 characters): FUGITIVE EMISSIONS CALCULATED AT WORST CASE SCENARIO		

Segment Description and Rate: Segment _____ of _____

1. Segment Description (Process/Fuel Type) (limit to 500 characters):		
2. Source Classification Code (SCC):		3. SCC Units:
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters):		

D. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION

Potential Emissions

1. Pollutant Emitted: PM10, TSP		2. Pollutant Regulatory Code: EL	
3. Primary Control Device Code: 099	4. Secondary Control Device Code:	5. Total Percent Efficiency of Control: 90.0%	
6. Potential Emissions: PM10 : 0.20 lb/hr, 0.41 ton/yr TSP = 0.42 lb/hr, 0.86 ton/yr		7. Synthetically Limited? [X] YES	
6. Emission Factor: Reference: AP-42 (Section 13.2.4.2)		9. Emissions Method Code: 3	
7. Calculation of Emissions (limit to 600 characters): $E = k(0.0032)[u/5]^{1.3}[M/2]^{1.4}$ $E = 0.35(0.0032)[7/5]^{1.3} / [0.7/2]^{1.4} = 0.0081 \text{ lb/ton}$ $E = 250 \text{ ton/hr} (0.0081 \text{ lb/ton}) = 2.03 \text{ lb/hr}$ $E = (2.03 \text{ lb/hr})(1-0.90 \text{ collector efficiency}) (\sim 24 \text{ hr/day}) = 4.87 \text{ lb/day}$ $E = [(4.87 \text{ lb/day}) / (\sim 24 \text{ hr/day}) (4000 \text{ hr/yr}) / 2000 \text{ lb/ton}] = 0.41 \text{ ton/yr}$			
8. Pollutant Potential Emissions Comment (limit to 200 characters): <i>Aggregate Storage Piles & Conveyor Drops – Fugitive Emissions (controlled) are subject to 62-296.700 (2)(e)(f)</i>			

Allowable Emissions Allowable Emissions 1 of 7

7. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: NA
8. Requested Allowable Emissions and Units: <10% Opacity	9. Equivalent Allowable Emissions: PM10: 0.20 lb/hr, 0.41 ton/hr TSP = 0.42 lb/hr, 0.86 ton/yr
5. Method of Compliance (limit to 60 characters): Compliance will be achieved through initial and annual emissions compliance testing. Watering of stockpiles will be performed as to control fugitive emissions at all sites.	
6. Allowable Emissions Comment (Desc. Of Operating Method) (limit to 200 characters):	

Emissions Unit Information Section 9 of 9

**E. VISIBLE EMISSIONS INFORMATION
(Only Emissions Units Subject to a VE Limitation)**

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: VE10	2. Basis for Allowable Opacity: <input checked="" type="checkbox"/> Rule <input type="checkbox"/> Other
3. Requested Allowable Opacity: Normal Conditions: 10 % Exceptional Conditions: 10 % Maximum Period of Excess Opacity Allowed: NONE min/hour	
4. Method of Compliance: EPA METHOD 9	
5. Visible Emissions Comment (limit to 200 characters): Regulated under 62-296.320	

**F. CONTINUOUS MONITOR INFORMATION
(Only Emissions Units Subject to Continuous Monitoring)**

Continuous Monitoring System: Continuous Monitor _____ of _____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	<input type="checkbox"/> Rule <input type="checkbox"/> Other
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): NOT APPLICABLE	

G. EMISSIONS UNIT SUPPLEMENTAL INFORMATION

Supplemental Requirements

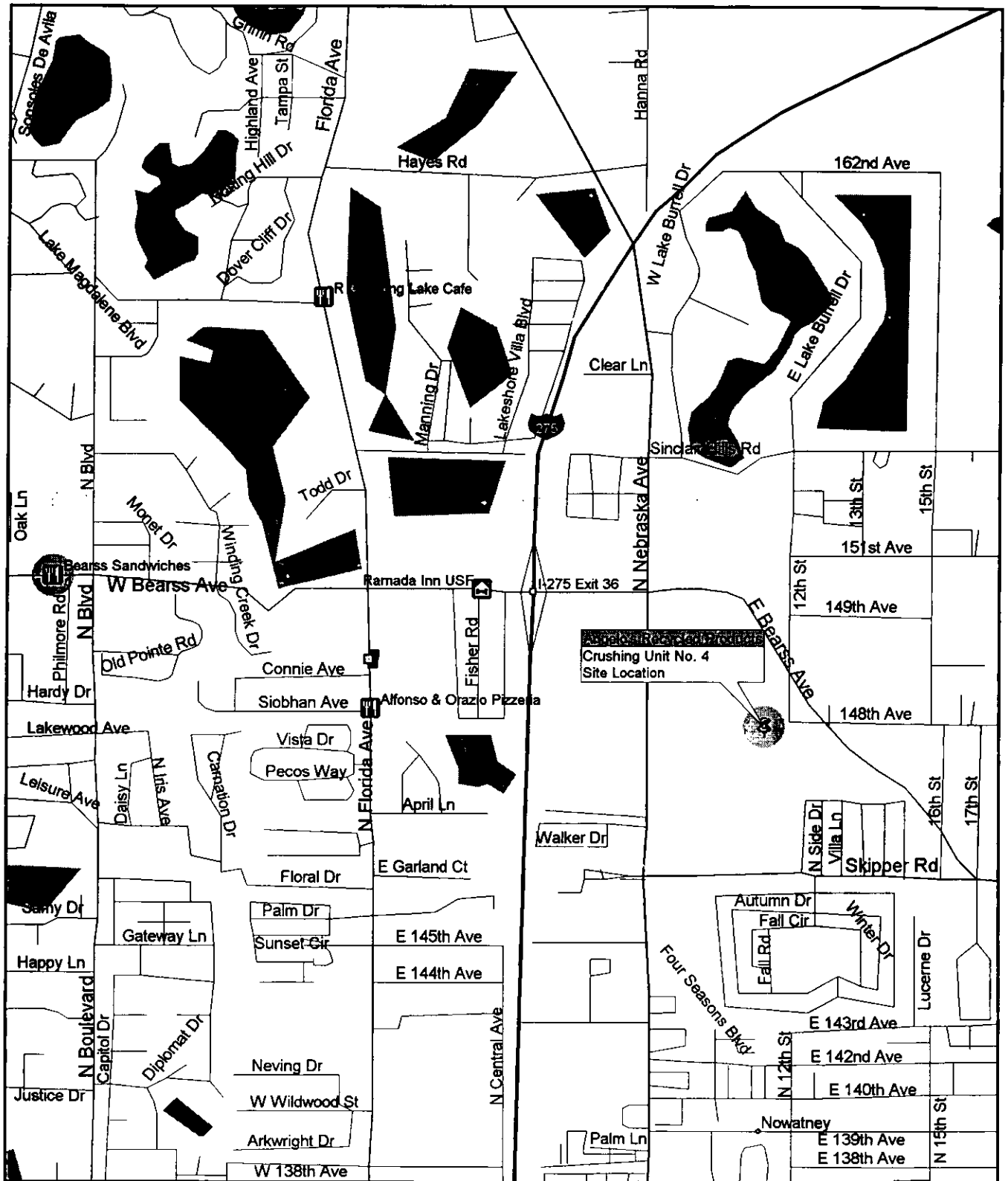
1. Process Flow Diagram <input checked="" type="checkbox"/> Attached, Document ID: <u>III</u> <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
2. Fuel Analysis or Specification <input checked="" type="checkbox"/> Attached, Document ID: <u>VII</u> <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested Can be found in supplemental information section of application
3. Detailed Description of Control Equipment <input checked="" type="checkbox"/> Attached, Document ID: <u>V</u> <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
4. Description of Stack Sampling Facilities <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
5. Compliance Test Report <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Previously submitted, Date: _____ <input checked="" type="checkbox"/> Not Applicable
6. Procedures for Startup and Shutdown <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
7. Operation and Maintenance Plan <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
8. Supplemental Information for Construction Permit Application <input checked="" type="checkbox"/> Attached, Document ID: <u>VI</u> <input type="checkbox"/> Not Applicable
9. Other Information Required by Rule or Statute <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable
10. Supplemental Requirements Comment:

TABLE OF CONTENTS

- I. FACILITY LOCATION**
- II. SITE PLAN**
- III. FLOW DIAGRAM**
- IV. UNCONFINED EMISSIONS**
- V. CONTROL EQUIPMENT**
- VI. O & M PLAN**
- VII. SUPPLEMENTAL INFORMATION**
- VIII. O & M PLAN**

I. FACILITY LOCATION

ANGELO'S RECYCLED MATERIALS PORTABLE RECLAIMED CRUSHING PLANT NO.4



Microsoft Expedia
Streets98

II. SITE PLAN

WOODED AREA

325HP CATERPILLAR

Generator Trailer

Magnet

Conveyor Belts

Cedarapids

Cone Crusher

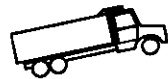
Vibrating Screener

Cedarapids Impact Crusher

Cedarapids Grizzly Feeder

Radial Conveyor Belt

N



Entrance

PROPERTY LINE

148th Ave.

12th Street

TO BEARSS AVE.

SOUTHDOWN CEMENT, INC.



Central Florida Testing Laboratories
12625-40th Street North
Clearwater, FL 33782

SCALE: NTS
DATE: 8-29-1999

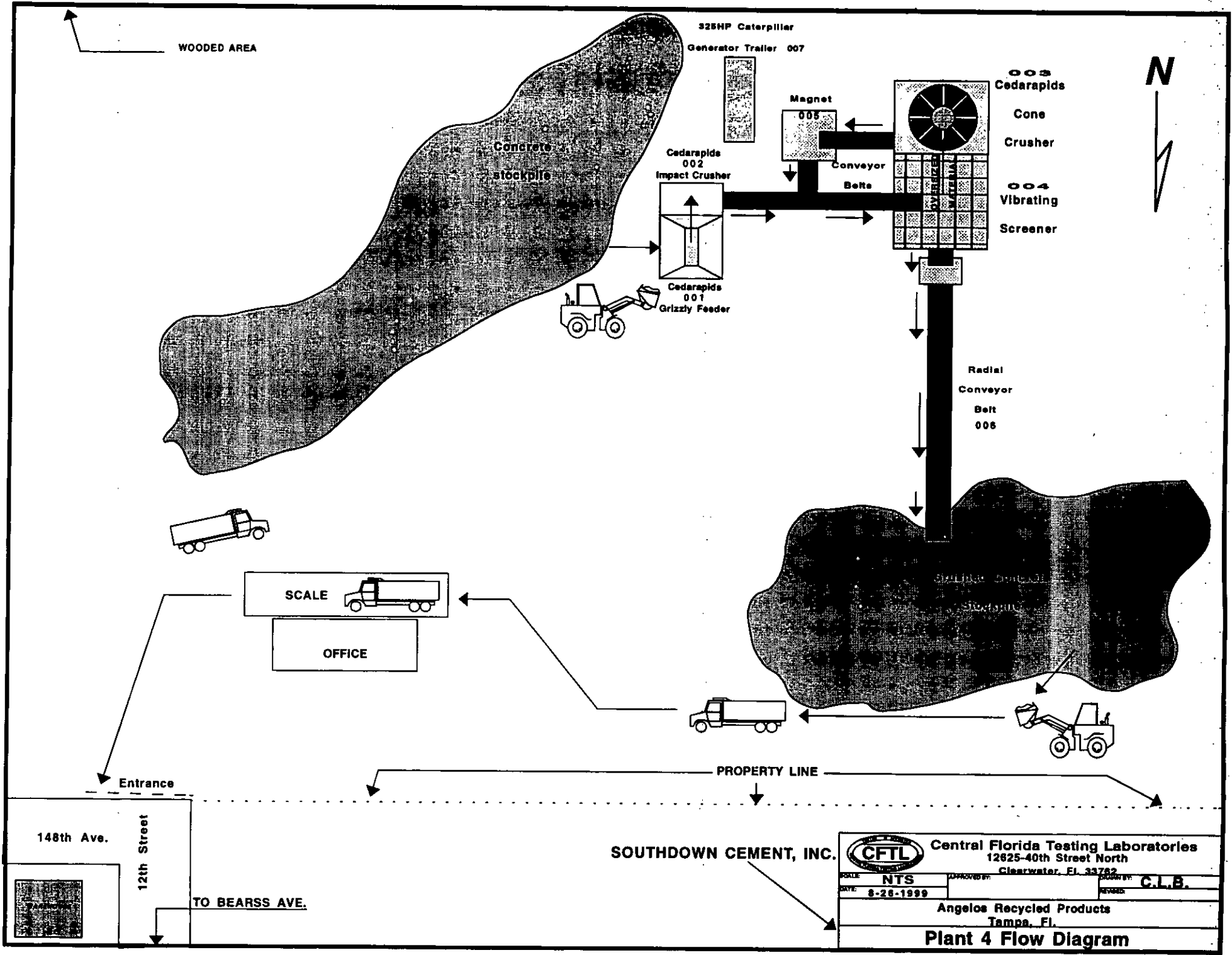
APPROVED BY: [Signature]

PROJECT: C.L.B.


Angelos Recycled Products
Tampa, FL

Plant 4 Plant Layout

III. FLOW DIAGRAM



SOUTHDOWN CEMENT, INC.

 Central Florida Testing Laboratories 12825-40th Street North Clearwater, FL 33782		APPROVED BY:	ISSUED BY:
		DATE: 8-26-1999	REVISION:
Angeles Recycled Products Tampa, FL		C.L.B.	
Plant 4 Flow Diagram			

IV. UNCONFINED EMISSIONS

FUGITIVE EMISSION CONTROL

Precautions to control and prevent fugitive emissions are accomplished at this site occurs in several manners. Any stockpiles at this location or any other location will be kept dampened by sprinker systems or by water truck to control airborne emissions by prevailing winds. All traffic areas will have an enforced and instructed 5 mph speed limit as well as kept damp by water truck or sprinker system on an as needed basis to control fugitive emissions.

V. CONTROL EQUIPMENT

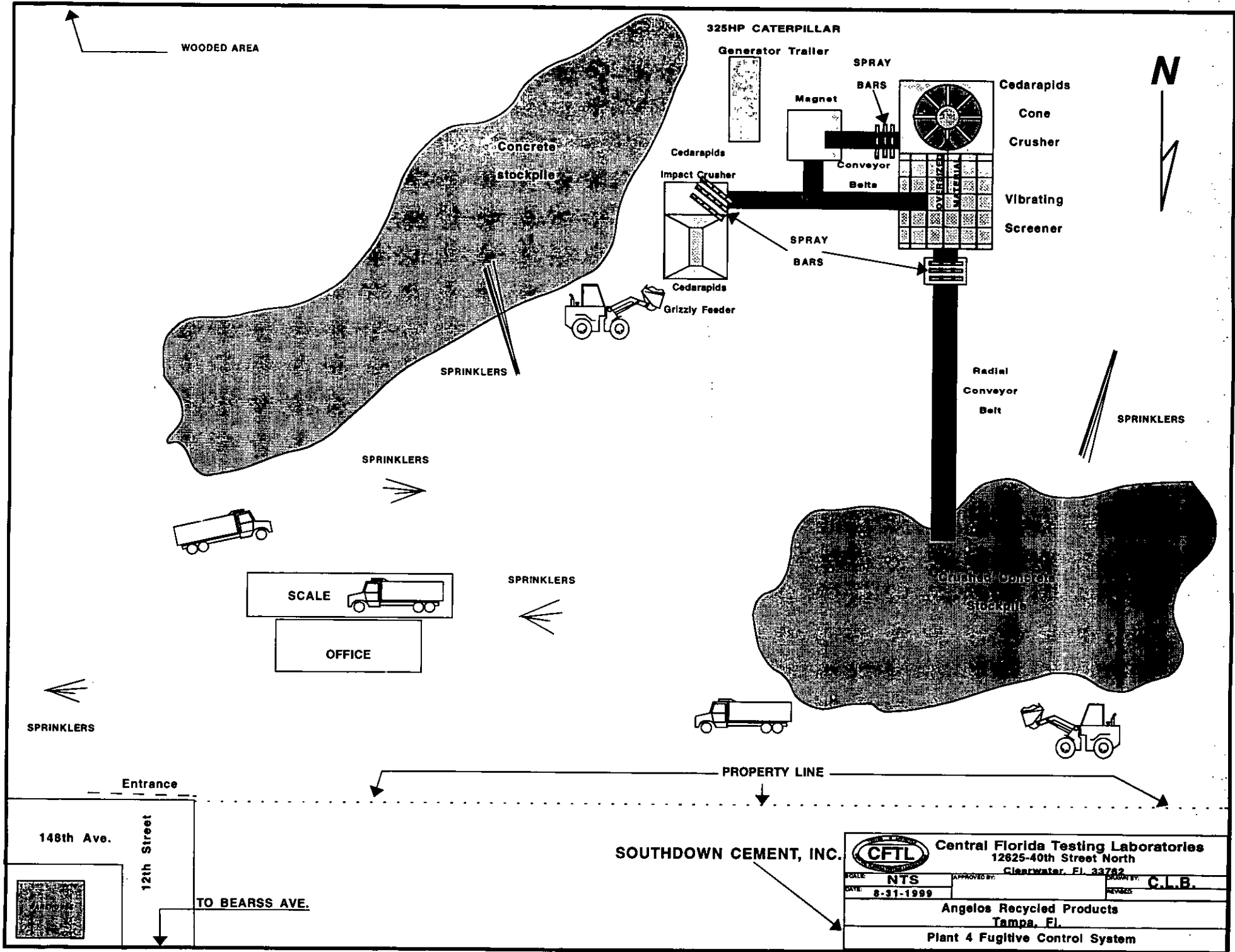
CONTROL EQUIPMENT

All of the equipment used to control fugitive dust emissions from this crushing unit was generated by crushing and maintenance personnel on as needed basis as this crushing unit did not come equipped with any dust suppression equipment when purchased.


The water spray bar and spray head system used on this equipment were manufactured and installed on all areas where possible fugitive dust emissions would occur during the crushing, screening and conveying operations. These areas include the grizzly feeder, the crusher, the conveyor belt drop points, screens and discharge pan.

The control process starts with an on site well that is equipped with two (2) electric pumps (only one used at a time as one is a spare) that is used to feed water through 1 1/2 inch PVC pipe to a hose bib rack. From the hose bib rack water is fed through either 1/2 PVC piping or 1/2 inch hose to spray heads and bars mounted at the various fugitive emission points mentioned above at 25-40 psi, depending what is needed to control the emissions. When at other sites the crusher is equipped with its own pump to supply water to the dust suppression spray bar system. Water is usually obtained from various sources such as on site water supplies, fire hydrant, lakes, ponds or water truck.

In addition, plant personnel stand on top of the feeder hopper, where the material is dumped in by front loader, dampening the material that is in the loader and the material that is being dumped into this hopper with a high pressure water hose, to control any fugitive emissions generated.



SOUTHDOWN CEMENT, INC.

 Central Florida Testing Laboratories 12625-40th Street North Clearwater, FL 33782	
SCALE: NTS	APPROVED BY: C.L.B.
DATE: 8-31-1999	REVISED:
Angelos Recycled Products Tampa, FL	
Plant 4 Fugitive Control System	

VI. O & M PLAN

General Maintenance Intervals

The crushing unit and the general area are checked visually, daily for visible emissions. The entire compound inclusive of storage piles are continuously kept damp by a water truck. If any fugitive emissions are seen escaping the crushing plant the source is identified immediately and the problem area is corrected. Fugitive emissions at drop points are controlled by increasing and decreasing the water pressure from 25-40 psi, at the spray bars/heads.

Inspections of various parts of the Self-Made Water Spray Bar / Spray Head Dust Suppression System are done on a daily basis before startup, during operation and after shut down, as well as complete inspection on a weekly basis. If anything is found broken, not functioning or out of the ordinary it is fixed immediately by trained plant personnel. In addition, this dust suppression system is equipped with a spare pump in case of breakdown the spare pump can be used until the other pump can be fixed.

OPERATING PARAMETERS
for
SELF-MADE WATER SPRAY BAR / SPRAY HEAD
DUST SUPPRESSION SYSTEM

Water Pressure to Spray Bars & Spray Heads
Operation Mode

20-45 psi @ each head

Continuous w/product

VII. SUPPLEMENTAL INFORMATION

ANGELO'S RECYCLED MATERIALS - PLANT NO. 4

Total Emissions Produced by Facility

Point	Emission Point Name	PM10 lb/hr	PM10 ton/yr	SOx lb/hr	SOx ton/yr	CO lb/hr	CO ton/yr	NOx lb/hr	NOx ton/yr	TOC lb/hr	TOC ton/yr
001	Receiving Hopper / Grizzly Feeder	0.42	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
002	Cedarapids 3054 Jaw Crusher	0.42	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
003	Cedarapids RC5411 Cone Crusher	0.42	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
004	Vibrating Screening Deck	0.96	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
005	Magnet Transfer Point	0.96	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
006	Radial Stacker Belt	0.96	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
007	Generator Set	1.07	1.67	1.00	1.56	3.28	5.12	15.12	23.73	1.24	1.93
008	Paved/Unpaved Roads	1.00	1.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
009	Fugitives from Stockpiles	^{0.20} 2.03	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	TOTALS: Crusher/Generator	7.17/1.07	8.56/1.67	0/1.00	0/1.56	0/3.28	0/5.12	0/15.12	0/23.73	0/1.24	0/1.93

6.41/1.07 10.23/1.67

15.21 ✓



central company, inc.

PETROLEUM PRODUCTS

CENTRAL OIL COMPANY, INC.

FUEL OIL #2 (DISTILLATE) SPECIFICATIONS

<u>CHARACTERISTICS</u>	<u>MIN</u>	<u>MAX</u>
GRAVITY, API AT 60°F	32.3	
SULPHUR, % WT.		0.21
POUR POINT, F		15.
BS & W. %		0.2
VISCOSITY, SSU/100F SECS	33	40.
VISCOSITY, KINEMATIC CST/40C	2.0	4.
FLASH POINT, PM CC, F	150.	
ASH, % WT.		0.01
CETANE NUMBER	40.	
CARBON RESIDUE, RAMSBOTTOM (10%)		!25.
CLOUD POINT, F		0.01
SEDIMENT BY EXTRACTION, % WT.	C&B	
APPEARANCE		1.5
COLOR, ASTM		1-A
CORROSION, COPPER STRIP 3 HRS. 122°F		"REPORT"
BTU PER U.S. GALLON		138,500

Cedarapids

PORTABLE AND STATIONARY ROCK AND GRAVEL CRUSHING PLANTS ●
SINGLE AND TWIN JAW CRUSHERS ● ROLL CRUSHERS ● HAMMERMILLS ●
LIMEMILLS ● SINGLE AND DOUBLE IMPELLER IMPACT BREAKERS ● FEEDERS ●
HORIZONTAL AND INCLINED VIBRATING SCREENS ● BELT CONVEYORS ●
RADIAL STACKERS ● STEEL BINS ● WASHING PLANTS ● COMPACTORS ●
BATCH AND CONTINUOUS TYPE ASPHALT MIXING PLANTS ● DRIERS ●
DUST COLLECTORS ● ASPHALT PAVERS ● STABILIZED BASE MIXERS

Counterweight Configuration

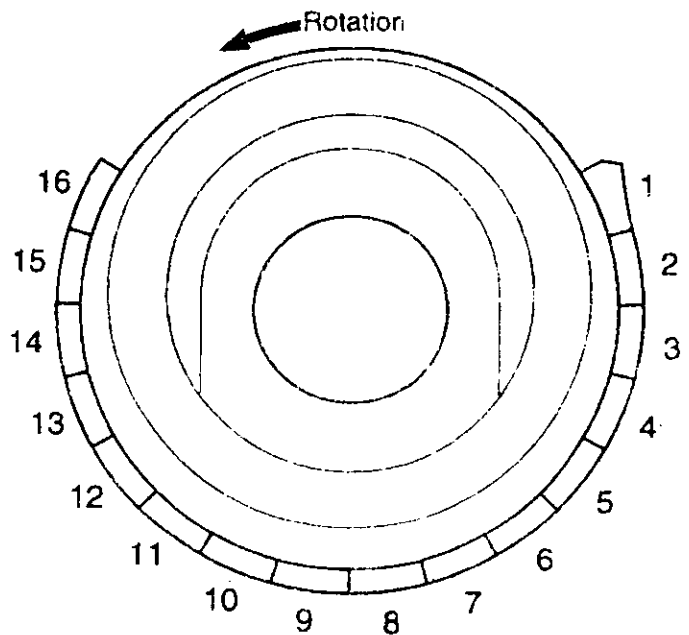
1. 02-540-289-0140 Wear Plate
2. Use Key 1
3. 02-540-290-0020
4. 02-540-291-0019
02-540-289-0040 Shim Qty 2
5. 02-540-291-0019
02-540-289-0040 Shim Qty 2
6. 02-540-291-0019
02-540-289-0040 Shim Qty 1
7. 02-540-291-0019
02-540-289-0040 Shim Qty 1
8. 02-540-291-0000
9. 02-540-291-0000
10. 02-540-291-0019
02-540-289-0040 Shim Qty 1
11. 02-540-291-0019
02-540-289-0040 Shim Qty 1
12. 02-540-291-0019
02-540-289-0040 Shim Qty 2
13. 02-540-291-0019
02-540-289-0040 Shim Qty 2
14. 02-540-291-0019
02-540-289-0020 Shim Qty 3
15. 02-540-289-0140 Wear Plate

16. Use Key 15

ANGELS RECYCLED M
(813) 903-0588

— JONATHAN CASTRO —

TAMPA - FLORIDA



Section 3 Rollercone Description

How It Works

The Rollercone II crushes rock in a continuous action. See Figure 3-1, a descriptive cutaway of a typical Rollercone II.

Rock to be crushed by the Rollercone II is fed through the hopper and into the crushing chamber, an area lined with cast manganese alloy. The upper crushing surface is the bowl liner; the lower is the mantle.

The mantle rests on the cone, which in turn mounts on the wedge plate. The rotating wedge plate moves under the cone like a cam with an upward thrust to make the oscillating movement of the cone and mantle. As a point on the mantle comes nearer and nearer to the bowl liner, the force that can be generated grows rapidly.

The gear-driven wedge plate rotates on large, low-friction roller bearings. Proper lubrication of thrust and radial bearings is very important in the Rollercone II. A pump, gear-driven directly off the pinion shaft, forces oil through the lubrication system when the pinion shaft is rotating in the proper direction. An electric pre-lube pump, mounted externally, pumps oil to the bearings at switchable intervals. During normal operation a flow-sensing device meters and monitors oil flow.

The movement between the mantle and the stationary bowl liner can be thought of as opening and closing the crushing surfaces, but it takes place in a circular area around a conical shape. The "closed side setting" (CSS) is the nearest the two crushing surfaces come to each other.

180° across the cone from the closed side, the oscillating movement makes an "open side" where the rock falls lower in the crushing chamber until it is discharged in a steady flow at the lower edge of the mantle. Under normal "choke feed" conditions, the rock will be caught three to eight times in the crushing action.

A combined force of pressurized hydraulic fluid and compressed gas pushes steadily downward during normal crushing to keep the bonnet in place. The bowl liner mounts to the bonnet. The bonnet rests on the bonnet support.

The upper portion of the crusher contains the tramp iron relief system. This system is highly pressurized but designed to yield if uncrushable material, like tramp iron, finds its way into the feed. Without any damage to the crusher the upper assembly quickly lifts to pass the tramp iron through the crushing chamber, then returns to the original position, to go on crushing as before.

After passing through the crushing chamber the rock falls out through the base to be removed at a rate at least equal to the feed rate.

Section 3 Rollercone Description

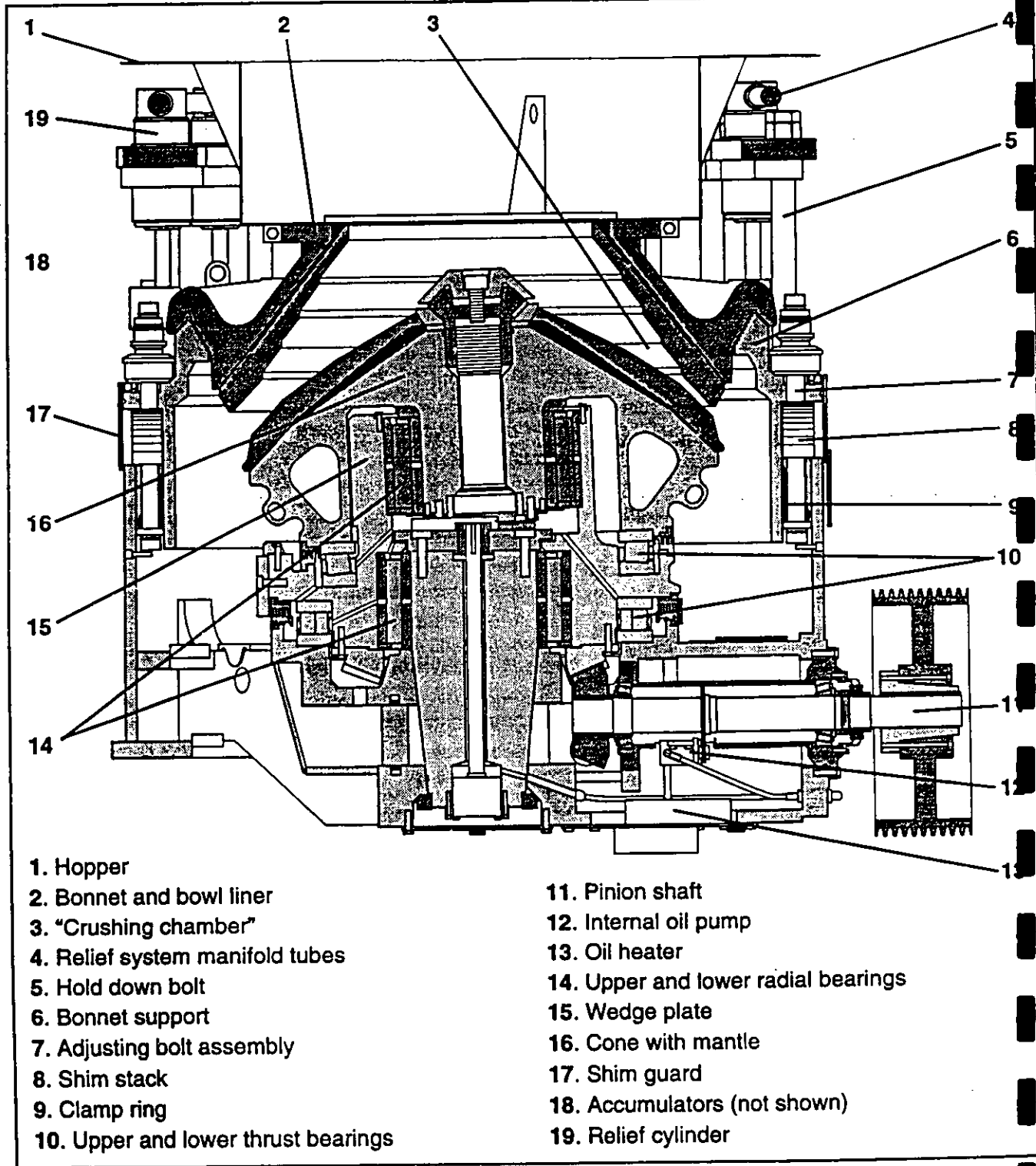


Figure 3-1
General Description Cutaway

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Section 3 Rollercone Description

Tramp Iron Relief System

The Cedarapids/ElJay Rollercone II uses a hydro-pneumatic tramp iron relief system that provides more protection to a crusher than any other known system in use today.

If properly maintained, the relief system holds the bonnet down with great force. It also allows a great deal of bonnet travel for passing tramp iron without crusher damage or stoppage.

The system includes hydraulic cylinders mounted in individual support beams. The beams mount over bonnet support with hold-down bolts to form a pressure ring. Push rods extend from sockets in each piston to sockets in bonnet. The hydraulic cylinders vent or relieve high pressure fluid to accumulators if uncrushable items enter the crushing chamber.

Notice: If you allow pressure to bleed off from the tramp iron relief system, bowl float will occur. Bowl float voids your warranty. Bowl float is defined as the periodic separation of the bonnet from the bonnet support (see Section 13- Glossary and Section 12- Troubleshooting).

The accumulator bladders are filled with nitrogen gas at $13\,450 \pm 345$ kiloPascals (kPa) at ambient temperature. English equivalents: 1950 ± 50 pounds per square inch (psi). Hydraulic fluid is then pumped into the system to compress the nitrogen bladders to $15\,900$ kPa (2300 psi). This provides reserve energy in the accumulators to keep the manifold and cylinder under continuous pressure.

The accumulator has enough capacity (19 liters or 5 gallons) to hold this reserve fluid plus the fluid that must be displaced through the manifold from the cylinders when tramp iron passes through the crusher.

Notice: This system does not tolerate hydraulic or nitrogen gas leaks. Any leaks will soon empty the available energy reserve in the accumulator.

Improvements in the Rollercone II

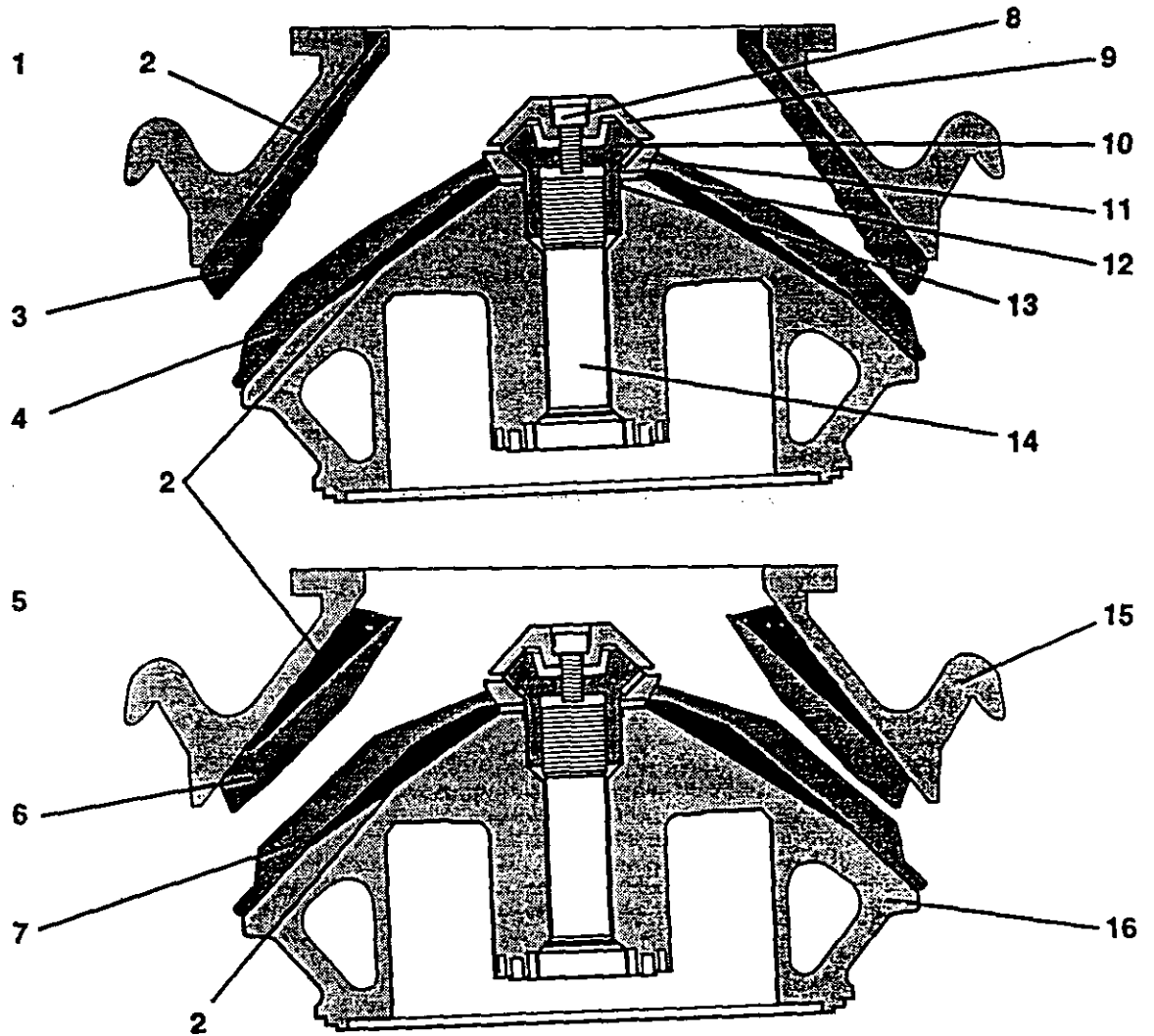
The Rollercone II ushers in a new generation of equipment that brings crusher technology into the 21st century. The improved Rollercone II increases your production, cuts maintenance costs, and enhances safety and durability.

Here are some of the improvements you will find in your Rollercone II:

- **An advanced crushing chamber design** with a large, unobstructed feed opening allows more rock to enter the crushing chamber, producing a more cubical product with a higher percentage passing the closed side setting. This feature can increase production up to 35%.
- **New spiral bevel gears** are sized for increased production and more efficient operation.
- **A newly redesigned bonnet** is thicker in cross section, with bolt-on rotation stops.
- **Patented replaceable vee seat inserts** help prevent metal erosion and transfer occurring during occasional bowl float and reduce the cost of vee seat repair.
- **The new tough fabricated base frame** is field-proven for durability. **Replaceable wear-resistant strut guards** protect against strut wear.
- **New split couplers** on adjusting bolts make changing manganese liners easier than ever.
- **Interchangeability between coarse and fine chambers** allows you to switch from coarse to fine crushing on the same machine. Simply change the manganese liners to have the right crushing chamber for every job. (Figure 3-2)

These new features combine to make the Cedarapids/ElJay Rollercone II the most versatile and durable on the market.

**Section 3
Rollercone Description**



- 1. Coarse chamber
- 2. Plastic backing
- 3. Coarse liner
- 4. Coarse manganese mantle
- 5. Fine chamber
- 6. Fine liner
- 7. Fine manganese mantle

- 8. Mantle nut cap bolt
- 9. Mantle nut cap
- 10. Mantle hold down nut
- 11. Mantle hold down washer
- 12. Sponge rubber
- 13. O-ring
- 14. Mantle hold down bolt
- 15. Bonnet
- 16. Cone

**Figure 3-2
Differences Between Fine and Coarse Chambers**

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Section 3 Rollercone Description

Anti-Spin Brake

The anti-spin brake, shown in Figure 3-3, prevents the cone head from spinning when the crusher runs empty. During crushing, the brake allows the cone head to rotate slowly to the right (clockwise), but not to the left (counterclockwise). It provides smoother operation, and eliminates unnecessary manganese wear.

A torque bar is bolted and dowelled to the underside of the cone head. The torque bar slips inside the floating plate. A cone brake shaft engages the underside slot in the floating plate and is keyed to the brake shaft. The brake shaft projects down through the base frame spindle into an overrunning clutch, which is attached to a guide ring with bolts. The bolts are intended to shear off before any damage occurs to the shaft or clutch.

Notice: Do not replace the shearable bolts with hardened ones. This can cause damage to the clutch and/or shaft. Do not use bolts which are longer than 3/4".

Do not run the Rollercone II empty for long periods of time. If sump oil is warm enough to flow freely, no further warm-up is necessary. As soon as the drive sheave is up to speed, crushing can begin.

If the cone head turns left (counterclockwise) at start-up, consult a Rollercone Service Manual or Cedarapids Service Representative for repair procedures.

Section 3
Rollercone Description

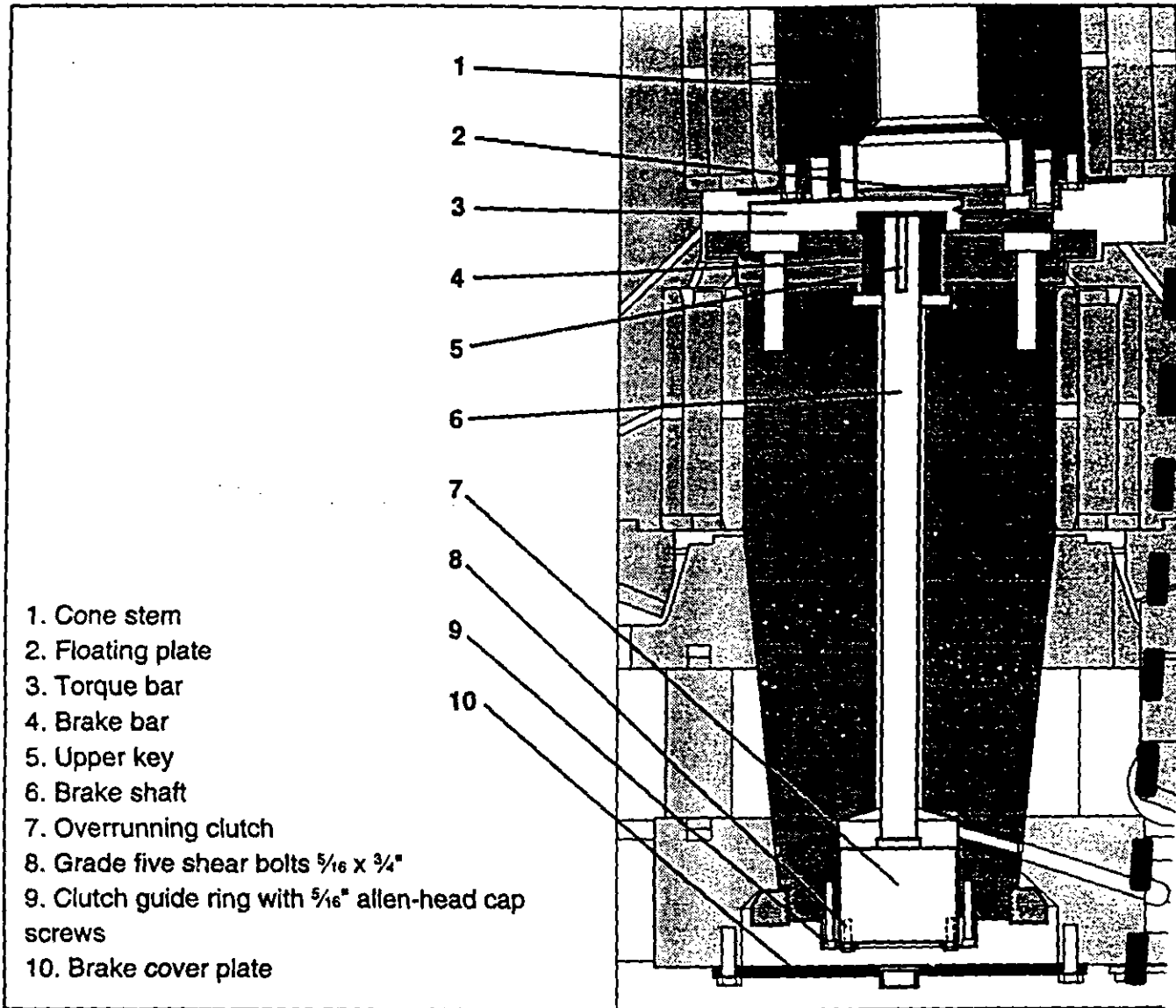


Figure 3-3
RC54II Anti-Spin Brake

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Section 4
Rollercone II Capabilities

Characteristics of Rock

In any rock crushing operation, the physical characteristics of the raw material affect the output product you can achieve. The characteristics of rock of most interest in the rock processing industry are abrasion, compressive strength, toughness, and specific gravity. Cedarapids Inc uses several material tests to quantify or compare rocks on the basis of these characteristics. These tests follow American Standards Testing Methods (ASTM) standard procedures.

Rock Abrasion

Tests for chemicals with known abrasive compounds can determine the abrasion characteristics of specific rocks. Silica dioxide (SiO₂), iron oxide (FeO) and aluminum oxide (Al₂O₃) are commonly found abrasive compounds in rock. Magnesium carbonate (MgCO₃) and calcium carbonate (CaCO₂) are also associated with abrasive effects. Abrasive test data are needed more for considering impact or grinder crushing, but abrasion is a factor in the wear life of Rollercone II manganese. A high abrasive content causes more liner wear. Rock samples can be sent for chemical analysis to Cedarapids Inc through your Cedarapids Distributor. Such samples should weigh only ½ to 1 kilogram (one to two pounds) and must be representative of the quarry to provide reliable information. Check with your distributor to get details of the sampling process.

Rock Compressive Strength

Generally rock with compressive strength up to 345,000 kPa (50,000 psi) with acceptable hardness and toughness value is considered suitable for reduction in Rollercones. Before attempting to crush rock with greater than 345,000 kPa (50,000 psi) compressive strength, consult the factory. A scale roughly corresponding to that given in more detail in ASTM C170 is shown next for your convenience:

34000 to 69000 kPa (5,000 to 10,000 psi)	Soft
69000 to 138000 kPa (10,000 to 20,000 psi)	Medium
138000 to 207000 kPa (20,000 to 30,000 psi)	Hard
207000 to 310000 kPa (30,000 to 45,000 psi)	Very Hard
over 310000 kPa (over 45,000 psi)	Extremely Hard

Some practical testing of hardness you can do in the field is based on the Mohs Scale of Hardness. Talc has a Mohs hardness value of one and diamond the value ten.

Talc = 1	Orthoclase = 6
Gypsum = 2	Quartz = 7
Calcite = 3	Topaz = 8
Fluorite = 4	Corundum = 9
Apatite = 5	Diamond = 10

With this scale a rock that can be scratched with:

- Your fingernail = about 2
- Copper coin = about 3
- Pocket knife = over 5
- Window glass = 5-½
- Steel file = 6-½

For more extensive information about types and characteristics of rock, consult your Cedarapids Distributor and the Cedarapids Pocket Reference Guide.

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**Section 4
Rollercone II Capabilities****Controlling Wear**

The manganese wear parts in a Rollercone II crusher are designed to wear well in the hammering, compressive action created by the oscillation of the mantle against the bowl liner. Manganese wears faster in highly abrasive conditions.

The strategy for controlling wear is to reduce chances for abrasive action and increase chances for compressive action wherever possible.

Here are five tips to help maximize wear life:

- Make sure the crushing chamber is choke fed as often and as much as possible.
- Provide efficient screening prior to crushing to prevent as much abrasive sand and fines as possible from entering the crushing chamber.
- Eliminate as much water as possible from entering the crushing chamber. Water mixed with the infeed increases the abrasive characteristics of the rock.
- Crush across as much surface area of the mantle as possible. Try to make the mantle surface work (and wear) fully from top to bottom, not just at the parallel zone.
- Use the appropriate manganese configuration for the type of rock and the desired size reduction. A coarse bowl liner is less appropriate for rock crushed to finer grades.

Getting Better Production

At any equivalent crusher setting and screen opening, Cedarapids/ElJay cones yield a higher percentage of product than competitive cone crushers. For you this means greater net capacity.

To get most production, it is best to set Rollercone II no tighter than minimum necessary to get product size you want. The unique low angle of fall in crushing chamber and virtual zero clearance at bearings allow settings that are very close to finished product size. Make sure feed has only a minimum of rock already to size.

Minimum closed side setting is closest setting possible that does not induce bowl float. Actual minimum closed side setting at a given crushing site can vary widely, depending on the nature and condition of the material being crushed, as well as common variations in crusher operating styles.

Example: if a Rollercone II is in a closed circuit making 16 mm minus ($\frac{3}{8}$ " minus), screen should have enough capacity so that very few 16 mm ($\frac{3}{8}$ " or smaller rocks return to crusher. Too much rock that is near size can cause bowl float, an unacceptable condition that can damage your crusher. In an open circuit many operators find that a setting about 3 mm ($\frac{1}{8}$ " tighter than desired product size yields a product with a higher percentage passing sizing screen.

Under some conditions, when the setting is too close, "pancakes" form and the bowl will float. If this condition exists, increase the setting until bowl float stops. See Section 12- Troubleshooting.

To get the most production it is also very important to choke feed your crusher. Uniform choke feeding not only increases volume going through your crusher but makes a better quality product. Product is more uniformly broken to grade specifications and is more cubical in shape when the crusher is choke fed.

Cubical fractures (broken edges with nearly 90° angles; see Section 13- Glossary) are best for most crushed rock applications because the right angles compact more efficiently and with more stability. Choke feeding helps reduce occurrences of elongated rock particles. Rock pieces that are long and narrow can pass through the crusher without being further reduced in size. This type of rock does not compact as well as cubical rock pieces.

Although it is best to choke feed the Rollercone II sometimes providing a high enough feed rate to choke feed it is difficult. In these conditions, build surge pile or surge bin and run the crusher only when enough material is on hand to choke feed it. Another possible action, when the crusher can't be choked, is to slow the incoming feed speed with a batt

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Section 4 Rollercone II Capabilities

Preventing Bowl Float

Bowl float is the periodic separation of the bonnet from the bonnet support (see Section 13- Glossary).

Notice: Bowl float causes excessive wear and premature failure of some components.

Allowing bowl float voids the warranty.

Check the crusher for bowl float after making any change in setting, feed material, or feed rate. **The minimum closed side setting is the closest setting possible that does not induce bowl float.** Bowl float causes damage to vee seat wear strips. If it goes on too long it will cause the relief cylinder seals to leak and can lead to bonnet cracks. The end result will be costly repairs and downtime.

Bowl float may not be visible without careful observation. You can detect it by looking for movement between the bonnet and bonnet support or between the rotation stop blocks. Even a small but continual movement can develop serious problems.

A number of factors can contribute, separately or in combination, to bowl float. See Section 12- Troubleshooting, for a discussion of how to prevent bowl float.

What You Should Know about the Rollercone II Bearings

The roller bearings in the Rollercone II need a constant, clean oil flow. The smooth running, low-vibration Rollercone II is sensitive to weight imbalances. Listening to and watching carefully for unusual vibrations can give you an early indication of the need for maintenance. See Section 6- Transport and Travel, for important notes about blocking the cone head to protect the roller bearings.

One source of imbalance is wear to the counterweights, especially the leading counterweight. Dirt or mud build-up in the crusher or motor sheaves can also cause unbalanced running. Normally, with plenty of clean oil and smooth, low-vibration running, the roller bearings will last a long time and help you produce profitable margins.

board or other means (see Section 7- Installation). If the incoming rock has too much velocity, it could pass so quickly through the crushing chamber that it would not be crushed properly.

When the Rollercone II is used as a secondary crusher, some operators run the primary crusher for an extra shift to make a surge pile, so a continuous supply of rock is available to choke feed the Rollercone II.

Capacity and gradation charts are included in Section 9- Changing Closed Side Settings. These charts show typical capacities of Rollercone IIs crushing igneous rocks (granite, trap, basalt, etc). Gradation charts show the average product grades of widely separated tests in open circuit when choke fed. The gradation and capacity charts are offered to show what is possible with the Rollercone II.

Your product grades and capacities may differ because different rock content results in different crushing performance. Also, how you operate your crusher will determine its performance.

Please carefully study the capacity and gradation charts to make best use of your Rollercone II. Your Cedarapids Distributor will be glad to discuss gradations and capacities appropriate to your crushing needs. The feed openings in the charts are based on new manganese and ideal screening conditions.

Cedarapids cone mantles and bowl liners are wear parts. Their design gives the best wear-to-production ratio. As each rock is crushed, it gets more cutting edges as it passes through the crushing chamber. The cutting and scraping of the rock wear away the manganese surfaces, causing the closed side setting to gradually increase. The rate of wear depends on the amounts of rock being crushed, the hardness of the rock, the condition and cross-sectional shape of the manganese, moisture content, and other factors.

The "parallel zone" wears down fastest. Adjust the closed side setting as needed to compensate for manganese wear.

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Section 4 Rollercone II Capabilities

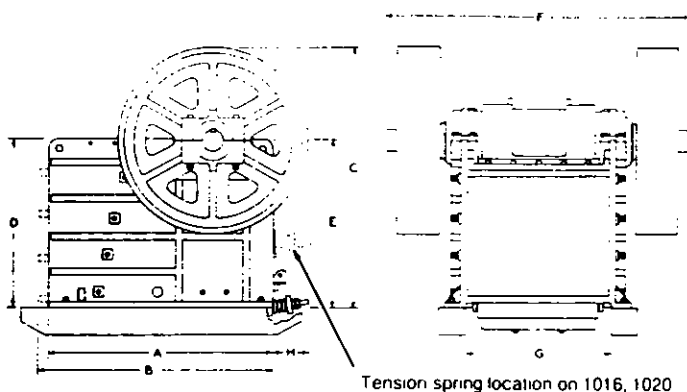
Other factors can reduce the Rollercone II's performance. If you are getting lower product rates than expected, Section 12- Troubleshooting, may help.

Why Does the Rollercone II Use Roller-type Bearings?

The roller bearing design of the Rollercone II allows no significant variation in the length of the oscillating stroke of the Rollercone II cone head, whether

running empty or loaded. This virtual zero clearance makes the Rollercone II able, under normal conditions, to work at very close settings and effective ratios of reduction. This means balanced vibration-free running and better sizing.

The only things that affect a Rollercone II's settings are wear of manganese and bowl float, or bowl float. Manganese wear can be controlled and monitored. Bowl float should never be allowed. For more information, see Section 12- Troubleshooting.



Recommended Openings at Closed Stroke - inches & (mm)

Size	Min.	Max.	Size	Min.	Max.
1016	¾ (19)	3½ (89)	2248	2½ (64)	6 (152)
1020	¾ (19)	3½ (89)	2436	2½ (64)	6 (152)
1024	¾ (19)	3½ (89)	2438	4½ (114)	8 (203)
1036	1½ (38)	3½ (89)	2542	3½ (89)	10 (254)
1236	1½ (38)	5 (127)	2742	3½ (89)	10 (254)
1242	1½ (38)	5 (127)	3042	4 (102)	13 (330)
1248	1½ (38)	5 (127)	3054	3½ (89)	13 (330)
1524	1½ (38)	5 (127)	3242	4 (102)	13 (330)
1636	1½ (38)	5 (127)	3648	4 (102)	13 (330)
1642	1½ (38)	5 (127)	3660	4 (102)	13 (330)
1648	1½ (38)	5 (127)	4242	14 (356)	23 (584)
1824	1½ (38)	5 (127)	4248	4 (102)	13 (330)
1836	1½ (38)	5 (127)	5460	6 (152)	20 (508)
2236	2½ (64)	6 (152)	5748	19 (483)	28 (711)

Dimension to the nearest inch & 5mm

Model	1016	1020	1024	1036	1236	1242	1248	1524	1636	1642	1648	1824	1836	2236
A	40 1015	48 1220	45 1145	48 1220	48 1220	56 1420	59 1500	55 1395	61 1550	71 1800	66 1675	56 1420	64 1625	66 1650
B	-	-	-	-	-	-	-	-	-	73 1855	-	-	-	-
C	41 1040	46 1170	46 1170	46 1170	51 1295	55 1395	56 1420	57 1445	63 1600	76 1930	70 1780	57 1445	63 1600	77 1955
D	24 610	28 710	28 710	28 710	32 810	33 840	35 890	36 915	41 1040	46 1170	41 1040	36 915	41 1040	48 1220
E	26 660	28 710	28 710	28 710	33 840	34 865	35 890	39 990	42 1065	48 1220	42 1065	39 990	42 1065	49 1245
F	58 1470	72 1830	72 1830	81 2055	81 2055	98 2490	104 2640	67 1700	92 2335	99 2515	94 2385	77 1955	92 2335	92 2335
G	22 560	26 660	27 685	41 1040	41 1040	47 1195	53 1345	27 685	41 1040	47 1195	53 1345	27 685	41 1040	43 1090
H	14 355	14 355	21 535	18 455	19 480	20 510	19 480	18 455	16 405	20 510	16 405	19 480	16 405	17 430

Model	2248	2436	2438	2542	2742	3042	3054	3242	3648	3660	4242	4248	5748	5460
A	79 2005	88 2235	67 1700	82 2080	88 2235	88 2235	88 2235	93 2360	107 2715	118 2995	103 2615	123 3125	138 3505	149 3785
B	81 2055	91 2310	-	85 2160	88 2235	91 2311	91 2311	99 2515	113 2870	-	109 2770	126 3200	141 3580	152 3860
C	83 2110	89 2260	77 1955	93 2360	92 2337	92 2337	92 2337	105 2665	120 3050	125 3175	105 2665	137 3480	137 3480	172 4370
D	52 1320	61 1550	50 1270	63 1600	62 1575	62 1575	63 1600	75 1905	82 2080	86 2185	75 1905	96 2440	96 2440	127 3225
E	54 1370	61 1550	49 1245	65 1650	64 1626	64 1626	64 1626	77 1955	84 2135	88 2235	77 1955	101 2565	101 2565	130 3300
F	99 2515	94 2385	92 2335	95 2415	99 2515	99 2515	110 2795	99 2515	101 2565	119 3025	99 2515	120 3050	120 3050	140 3555
G	53 1345	43 1090	43 1090	45 1145	47 1195	47 1195	69 1755	47 1195	52 1320	78 1980	47 1195	55 1395	55 1395	67 1700
H	16 405	17 430	18 455	19 480	17 430	17 430	20 510	22 560	20 510	28 711	22 560	20 510	20 510	18 455

Standard Features

- Fabricated, stress-relieved welded steel base
- Rib-reinforced side plates
- Close-tolerance machining of jaw plate backs and seating surfaces
- Reversible key plates through model 2438
- Drop-forged, heat-treated, chrome-nickel-steel overhead eccentric shaft
- Spherical self-aligning roller bearings
- Hydraulic bearing removal for 3648 side bearing, models 4248 & 5460 side and pitman bearings
- Cast steel pitman
- Hydraulic/shim toggle seat adjustment (discharge opening) except wedge adjustment on 1016 and 1020
- One smooth and one grooved flywheel
- Split-hub flywheels
- Standard left-hand drive (face tension spring)

Options

- V-belt drives
- Grooving second flywheel
- Circulating oil lubrication system with reservoir and low-oil alarm for 1836 and above
- Steel skid for crusher and motor for 2236 and above
- Motor platform for 2236 and above
- Operator's platform, ladder and crusher hopper for 2236 and above
- Stationary grizzly with bypass chute for 2236 and above
- Undercrusher discharge chute to belt conveyor, end or side discharge, for 2236 and above

Dimensions to nearest inch & mm - weights (kg)

Model	1016	1020	1024	1036	1236	1242	1248	1524	1636	1642	1648	1824	1836	2236
Weights	5306 2406	7000 3175	8255 3744	12,551 5693	13,978 6340	19,936 9042	24,300 11022	12,305 5581	21,003 9527	33,998 15421	28,406 12885	12,426 5636	21,280 9653	24,903 11296
HP	20-30	25-40	40-50	55-70	60-75	70-100	80-120	40-60	60-90	100-130	100-150	40-60	60-90	90-125
RPM	300	250-300	250-300	250-300	250-300	250-300	250-300	250-300	250-300	250-300	250-300	250-300	250-300	250-300
Jaw Opening	10x16 255x405	10x20 255x510	10x24 255x610	10x36 255x915	12x36 305x915	12x42 305x1065	12x48 305x1220	15x24 380x610	16x36 405x915	16x42 405x1065	16x48 405x1220	18x24 455x610	18x36 455x915	22x36 560x915
Shaft Dia. Side Bearing	3.937 85	4.4375 113	4.4375 113	5.4375 138	5.9375 151	6.4375 164	6.4375 164	4.921 125	6.4375 164	8.6603 220	7.091 180	4.921 125	6.4375 164	6.4375 164
Shaft Dia. Pitman Bearing	5.120 130	5.907 150	5.907 150	7.4821 190	7.8764 200	7.875 200	7.875 200	6.694 170	7.875 200	10.2383 260	8.664 220	6.694 170	7.875 200	7.875 200
Std. Grooved Flywheel Dia.	30 760	36 915	36 915	36 915	36 915	42 1065	42 1065	36 915	42 1065	55 1395	42 1065	36 915	42 1065	55 1395
Face Std. Flywheel	7 175	11 280	11 280	11 280	11 280	12 305	12 305	11 280	12 305	13 330	12 305	11 280	12 305	13 330
Stationary Jaw Length	20 510	22 560	21 535	24 610	28 710	29 735	29 735	34 865	34 865	38 965	34 865	33 840	34 865	43 1090
Movable Jaw Length	26 660	27 685	27 685	27 685	31 785	33 840	34 865	40 1015	41 1040	45 1145	41 1040	40 1015	41 1040	50 1270

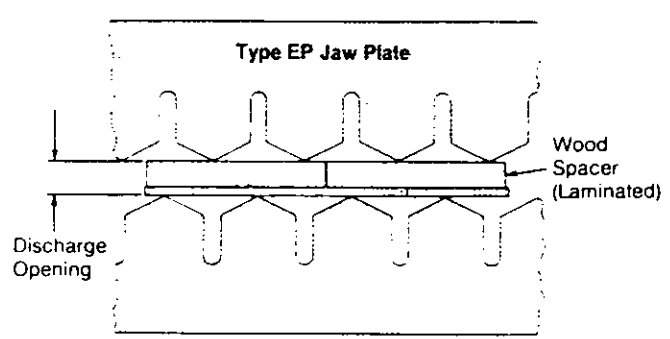
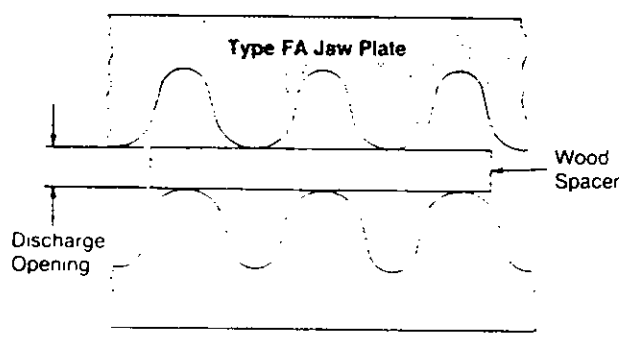
Model	2248	2436	2438	2542	2742	3042	3054	3242	3648	3660	4242	4248	5748	5460
Weights	43,094 19547	46,737 21200	26,017 11801	42,095 19366	48,520 22008	48,520 22008	52,740 28269	57,137 25917	79,653 36131	107,664 48836	58,838 26689	104,567 47431	117,000 53071	196,258 89023
HP	127-175	125-150	90-125	125-175	125-175	125-175	125-175	150-200	200-250	250-300	150-200	250-300	250-300	350-450
RPM	225-275	225-275	250-300	225-275	225-275	225-275	225-275	225-275	200-250	210-235	225-275	200-225	200-225	200
Jaw Opening	22x48 560x1220	24x36 610x915	24x38 610x965	25x42 625x1065	27x42 685x1065	30x42 760x1065	30x54 760x1372	32x42 810x1065	36x48 915x1220	36x60 915x1524	42x42 1065x1065	42x48 1065x1220	57x48 1445x1220	54x60 1372x1524
Shaft Dia. Side Bearing	8.36603 220	8.6603 220	6.4375 164	7.091 180	8.6603 220	8.6603 220	8.6603 220	8.6603 220	10.375 264	14.000 356	8.6603 220	14.000 356	14.000 356	18.000 457
Shaft Dia. Pitman Bearing	10.2383 260	10.2383 260	7.875 200	8.6645 220	10.2383 260	10.2383 260	10.2383 260	10.2383 260	11.815 300	15.570 400	10.2383 260	15.750 400	15.750 400	19.687 500
Std. Grooved Flywheel Dia.	57 1445	57 1445	55 1395	57 1445	57 1445	57 1445	57 1445	57 1445	72 1830	72 1830	57 1445	72 1830	72 1830	84 2134
Face Std. Flywheel	18 455	15 380	13 330	15 380	15 380	18 455	18 455	18 455	13 330	13 330	18 455	13 330	13 330	20 510
Stationary Jaw Length	45 1145	53 1345	43 1090	57 1445	57 1445	57 1445	57 1445	68 1725	77 1956	77 1956	68 1725	90 2285	90 2285	113 2870
Movable Jaw Length	56 1420	65 1650	50 1270	63 1600	65 1650	65 1650	65 1650	75 1905	85 2160	85 2160	75 1905	98 2490	98 2490	129 3277

Design and specifications subject to change without notice.
Design features may be covered by patents issued and/or patents applied for.

Jaw Crusher Capacity in tons and (metric tons)

Jaw Size in. & (cm.)	10 x 16 (25 x 41)	10 x 20 (25 x 50)	10 x 24 (25 x 61)	15 x 24 (38 x 61) 18 x 24 (46 x 61)	10 x 36 (25 x 91) 12 x 36 (30 x 91) 16 x 36 (41 x 91) 18 x 36 (46 x 91)	22 x 36 (56 x 91) 24 x 36 (61 x 91)	24 x 38 (61 x 97)	12 x 42 (30 x 107)	(12 x 48) (30 x 122) 16 x 48 (41 x 122) 22 x 48 (59 x 122)	25 x 42 (61 x 107) 64 x 42 (69 x 107)	30 x 42 (76 x 107) 32 x 42 (81 x 107)	42 x 48 (107 x 122) 57 x 48 (148 x 122) 36 x 48 (91 x 122)	30 x 54 (76 x 137)	36 x 60 (91 x 152) 54 x 60 (137 x 152)
¾"	10-20	10-25	15-25											
19mm	(9-18)	(9-23)	(14-23)											
1"	15-25	20-30	25-35											
25.4mm	(14-23)	(18-27)	(23-32)											
1½"	25-35	25-45	35-50	35-50	55-75			60-90	70-100					
38.1mm	(23-32)	(23-41)	(32-45)	(32-45)	(36-68)			(54-81)	(63-90)					
2"	30-45	40-55	50-70	50-70	70-100			85-115	115-130					
50.8mm	(27-41)	(36-50)	(45-63)	(45-63)	(63-90)			(77-100)	(104-117)					
2½"	40-55	50-70	60-85	60-85	95-125	95-125		105-145	125-165					
63.5mm	(36-50)	(45-63)	(54-77)	(54-77)	(86-113)	(86-113)		(95-131)	(113-149)					
3"	50-70	60-85	70-100	70-100	110-150	110-150		125-175	150-200					
76.2mm	(45-63)	(54-77)	(63-90)	(63-90)	(99-135)	(99-135)		(113-158)	(135-180)					
3½"	60-80	70-100	85-115	85-115	125-175	125-175		155-205	180-230	155-205				
88.9mm	(54-72)	(63-90)	(77-104)	(77-104)	(113-158)	(113-158)		(140-185)	(162-207)	(140-185)				
4"				100-130	150-200	150-200		175-225	210-260	175-225	175-225	210-260	235-285	265-315
101.6mm				(90-117)	(135-180)	(135-180)		(158-203)	(189-234)	(158-203)	(158-203)	(189-234)	(212-257)	(239-284)
4½"				110-150	170-220	170-220	180-230	200-260	230-290	200-260	200-260	230-290	260-320	295-355
114.3mm				(99-135)	(153-198)	(153-198)	(162-207)	(180-234)	(207-261)	(180-234)	(180-234)	(207-261)	(234-288)	(266-320)
5"				120-170	190-250	190-250	200-260	225-285	260-320	225-285	225-285	260-320	295-355	335-395
127.0mm				(108-153)	(171-225)	(171-225)	(180-234)	(203-257)	(234-288)	(203-257)	(203-257)	(234-288)	(266-320)	(302-356)
6"						230-300	240-320		310-390	260-340	260-340	310-390	355-435	400-480
152.4mm						(207-270)	(216-288)		(279-351)	(234-306)	(234-306)	(279-351)	(320-392)	(360-432)
7"							285-365			320-400	320-400	370-450	420-500	470-550
177.8mm							(257-329)			(288-360)	(288-360)	(333-405)	(378-450)	(423-495)
8"							320-420			350-450	350-450	415-515	475-575	530-630
203.2mm							(288-378)			(315-405)	(315-405)	(374-464)	(428-518)	(477-567)
10"										460-560	460-560	530-630	605-705	680-780
254mm										(414-504)	(414-504)	(477-567)	(545-635)	(612-702)
12"											560-660	650-750	740-840	830-930
304.8mm											(504-594)	(585-675)	(666-756)	(747-837)

All capacities are based on 100 lbs. per cu. ft. (1602 kg/m³) weight of rock. Tonnage may vary depending on particle size of feed, rate of feed, proper operating conditions, breaking characteristics and compressing strength of rock. Type of jaw faces and horsepower used can also affect capacity.



To set FA, EP, or E style jaws, use a piece of wood cut to correct size and set between jaws as shown.

Design and specifications subject to change without notice.
 Design features may be covered by patents issued and/or patents applied for.

Jaw Crusher

Features

- Submerged arc welded all-steel base (thermally stress relieved in oven at 1400°F).
- Side bearings directly over side plates.
- Independent side bearing housings.
- Minimum bearing center distance to eliminate flexing.
- Spherical, self-aligning roller bearings to handle side thrush.
- Positive, maintenance-free labyrinth seals to keep out dust.
- Oil/grease lubrication - large sizes for more positive lubrication.
- Drop forged, heat treated 4340 chrome-nickel-steel alloy shafts.
- Massive, large diameter split hub flywheels (most sizes) to maintain inertia and remove easily.
- Cast steel pitman with machined surfaces for highest strength.
- Several Manganese jaw plate choices.
- Steep toggle plate for aggressive crushing action.
- Hydraulic-shim adjustment.
- Two convertible rip-rap crushers (4242-3242 & 5748-4248).
- Widest range of crusher sizes (26 total).
- Optional hydraulic toggle for quick adjustment and high pressure relief.

Jaw Crusher Calculated Weights

Model	Complete Total	Complete Pitman Assembly	Flywheel Only (Each)
1016	5,306	2,844	690
1024	8,255	4,817	1,275
1036	12,551	7,449	1,223
1236	13,978	8,007	1,250
1242	19,521	12,120	2,098
1248	24,300	14,374	2,175
1524	12,305	6,771	1,215
1636	21,003	11,895	2,075
1642	33,998	19,642	2,741
1648	32,406	16,988	2,684
1824	12,426	6,771	1,215
1836	21,280	12,105	2,126
2236	24,903	14,266	2,785
2248	43,094	25,746	3,700
2436	46,737	22,861	3,462
2438	42,695	21,832	3,509
2540	45,000	18,950	4,200
2542	42,095	21,832	3,584
2742	45,992	24,416	3,675
3042	48,520	25,842	4,194
3054	52,740	27,525	4,194
3242	57,137	28,755	4,028
3648	79,653	39,524	5,560
3660	107,664	58,478	5,595
4242	58,838	28,755	4,028
4248	104,567	52,827	5,595
5460	196,258	102,715	10,570
5748	117,000	52,827	5,595

Service Technical Information

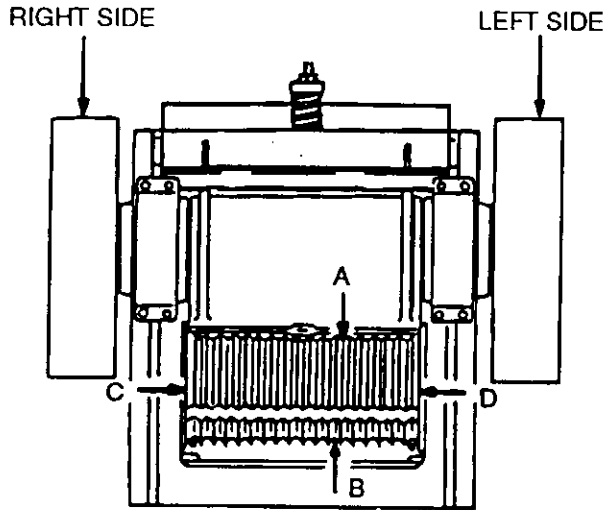


Figure 1
Jaw Crusher Opening

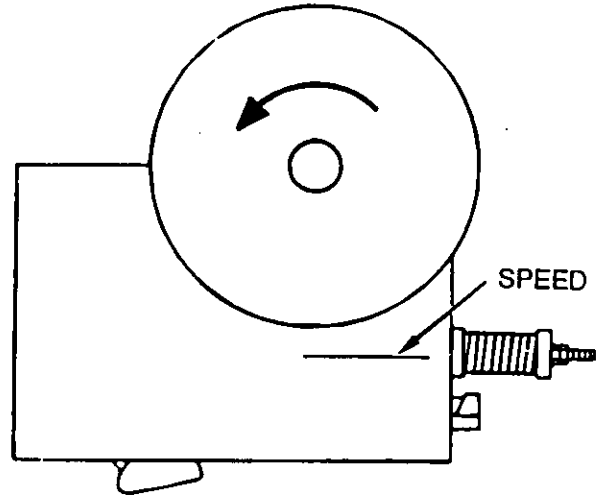


Figure 2
Direction of Rotation

Right & Left Side

Right and left side of crusher are determined when standing facing the tension springs. (Figure 1)

Table 1
Recommended Openings at Closed Stroke (Inches & mm)

Size	Minimum		Maximum		RPM Range
	Inches	mm	Inches	mm	
1016	3/4	19	3-1/2	89	250-300
1020	3/4	19	3-1/2	89	250-300
1024	3/4	19	3-1/2	89	250-300
1036	1-1/2	38	3-1/2	89	250-300
1236	1-1/2	38	5	127	250-300
1242	1-1/2	38	5	127	250-300
1248	1-1/2	38	5	127	250-300
1524	1-1/2	38	5	127	250-300
1636	1-1/2	38	5	127	250-300
1648	1-1/2	38	5	127	250-300
1824	1-1/2	38	5	127	250-300
1836	1-1/2	38	5	127	250-300
2236	2-1/2	64	6	152	250-300
2248	2-1/2	64	6	152	225-275
2436	2-1/2	64	6	152	225-275
2438	4-1/2	114	8	203	250-300
2442	3-1/2	89	10	254	225-275
2742	3-1/2	89	10	254	225-275
3042	4	102	13	330	225-275
3054	4	102	13	330	225-275
3242	4	102	13	330	225-275
3648	4	102	13	330	200-250
4242	14	355	23	584	225-275
4248	4	102	13	330	200-225
5460	6	152	20	508	200
5748	19	483	28	711	200-225

Table 2
"All Grease" Lubrication Capacities (Lbs. Required)

Crusher Size	Each Side Bearing	Pitman Bearings
1016	2	4
1020	2	5
1024	2	8
1036	2	14
1236	2	18
1524, 1824	3	8
1536, 1636, 1836	6	25
2236	4	23
1242	4	27
1248	4	32
2540, 2442	7	33
2436	12	29
1648	9	38
2640, 3040, 1642	10	48
3042, 3242 4242, 3054	10	48
2248	8	55
2742	10	47
3648	12	64
4248, 5748	9	51
5460	31	153

General Information**Pitman Assembly Procedure**

All pitman and side bearing end cap bolts are to be of the self-locking type and **Loctite #271** is also to be applied. Then tighten bolts to correct torque.

All seals with grooved lands should be packed with proper grease when assembling. After assembly, purge seal on grease lubricated unit. Remove grease fitting for seals and install plugs.

Removing Clearance from Straight Bore Pitman Bearings:

Be sure no more than 50% of the unmounted clearance is removed after the bearings have cooled and shrunk in place on the shaft.

Removing Clearance from Tapered Side Bearings:

Remove between 40% and 50% of the unmounted clearance, no more.

Example: Unmounted (bench) clearance = .010. 40% = $.010 \times (.4) = .004$; 50% = $.010 \times (.5) = .005$. .010 minus .004 = .007; .010 minus .005 = .005

Record all unmounted and mounted clearances for future reference.

Jaw Crusher Lubrication

Proper lubrication for jaw crusher should follow guidelines established in our current Cedarapids 010 Operation Manual until notified differently by Engineering.

Be sure to add 20% grease just like new unit is an overhaul.

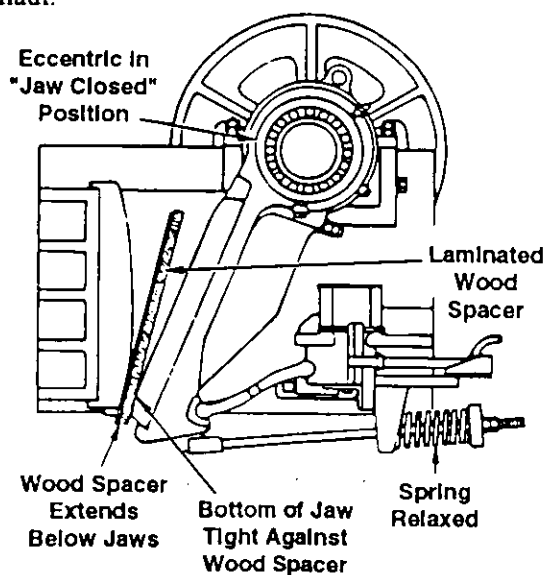


Figure 3
Jaw Cross-section Cut-away View

Setting Discharge Opening

To set the discharge opening between jaws to obtain the desired product size range:

- 1) When the crushing chamber is completely empty, stop the crusher drive and lock out the power source so no unexpected movement of the flywheel can occur.
- 2) Loosen nuts that hold base toggle seat.
- 3) Loosen tension spring nuts so shim pack can be adjusted.
- 4) Make a wooden spacer similar to Figure 7, to the exact thickness of the correct discharge opening. When lumber of proper width or thickness is not available, make up a lamination, including plywood, hard fibre board, or metal to obtain the correct thickness. Spacer must be wide enough to bridge between several jaw plate tips shown in Figures 5 & 6. This is especially important when setting the specified minimum discharge opening!
- 5) Turn the flywheel so that eccentric shaft closes the jaws as much as possible.
- 6) Hold the wooden spacer so that it is centered in the crushing chamber and extends below jaws. (Figures 3 & 4)
- 7) Force the bottom of the movable jaw tight against the wood spacer. Adjust shim packs uniformly to fix toggle seat in that position. (On some models this is done with a mechanical linkage)
- 8) Tighten nuts with hold base toggle seat.
- 9) Tighten tension spring nuts to restore holding force on toggle plate.

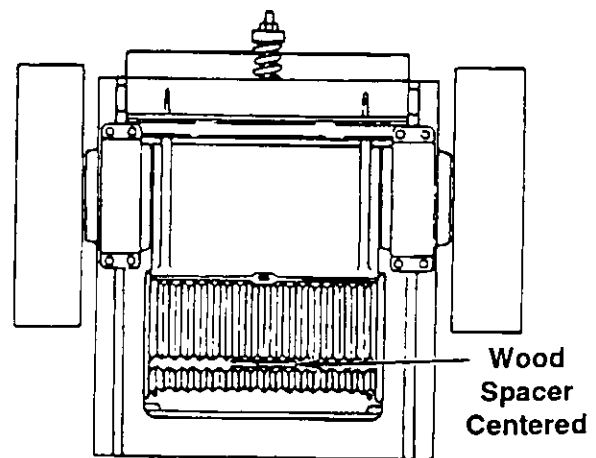


Figure 4
Jaw Top View

General Information

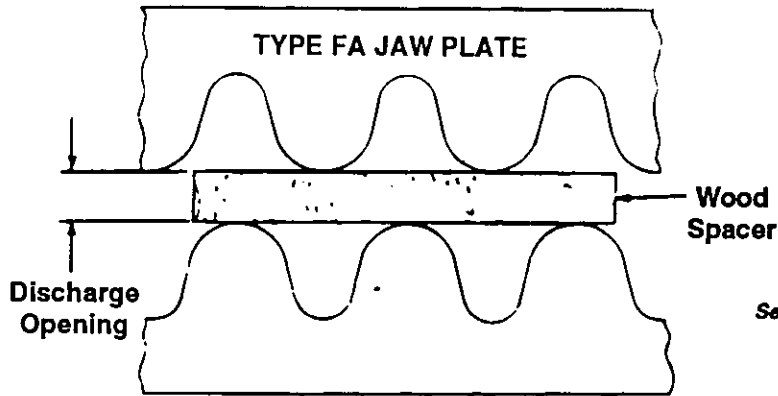


Figure 5
Setting Type FA Jaw Opening

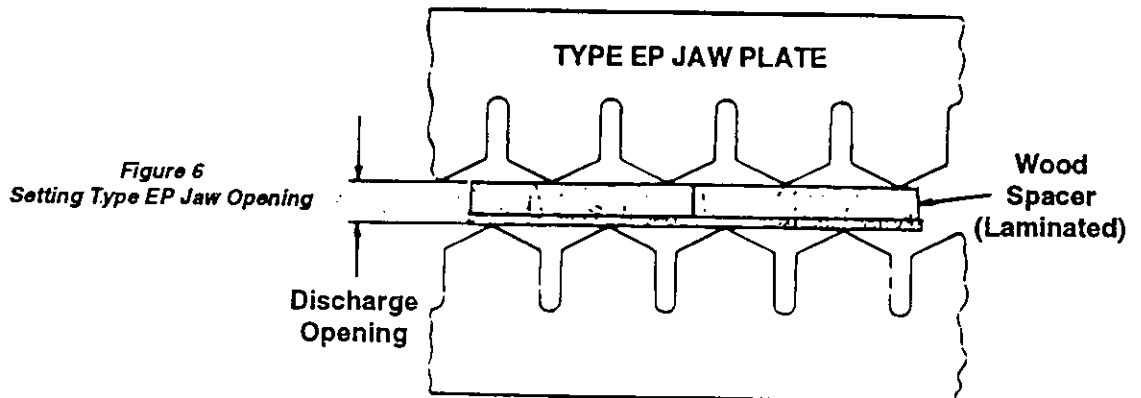


Figure 6
Setting Type EP Jaw Opening

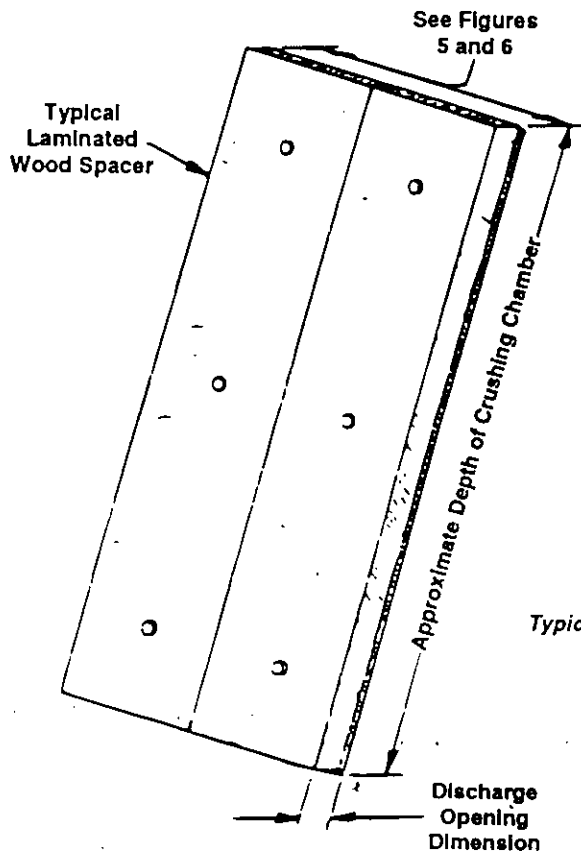


Figure 7
Typical Laminated Spacer

Jaw Crusher Adjustment Procedure



Caution! Never adjust crusher when it is being operated.

- 1) Loosen tension rods and spring assembly.
- 2) Loosen adjustable toggle plate seat wedges.
- 3) Install hydraulic ram(s) and pump.
- 4) Using a piece of wood the thickness of the desired opening hanging down to the bottom of the crushing chamber.
- 5) Pump the hydraulic rams to move the pitman toward the stationary jaw till block of wood is tight against both jaw plates.
- 6) Remove or install as required the necessary shims behind the adjustable toggle plate seals.

NOTE: Be sure shims are equal on both sides.

- 7) Release the hydraulic pressure - this will allow the pitman to retract forcing the shims tight against the base.
- 8) Retension the tension springs equally to insure the pitman, toggle plate and adjustable seat are all tight, one against the other.
- 9) Retension the adjustable toggle plate seat wedges.

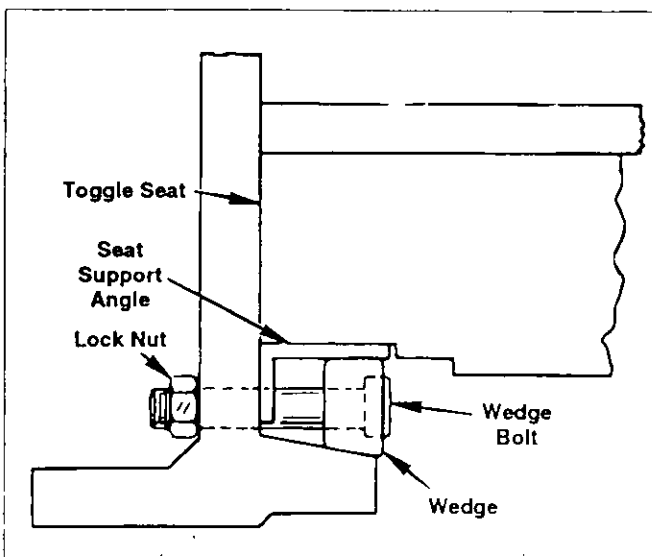


Figure 8
End View of Toggle Seat Wedge Assembly

General Information

Jaw Plates Installation

Base Stationary Jaw Plates & Key Plates

- 1) Stationary jaw machined surface must be checked for flatness both crosswise and top to bottom. In general, it should be within $\frac{1}{16}$ ", however, it will vary with each size crusher. Key plates should be checked in the same manner.
- 2) Stationary jaw must be centered in base and must be held tight against the bottom end of the base while in this position.
- 3) Lower key plates are installed and then a $\frac{3}{4}$ " or 1" spacer bar is set on top of the lower key plate and the upper key plate is installed.
- 4) Using a minimum of 16 lb. sledge hammer, you drive on the upper key plate forcing the lower key plate down tight in place.
- 5) A properly fitting key plate will have a minimum of 70% contact between the base guide and the ear of the jaw plate. The bolts which hold the key plates in the base should be halfway between the upper $\frac{3}{4}$ of the slotted hole in the base. At no time should the bolts contact either end of the base hole.
- 6) After the lower key plates are in position, remove the spacer and drive the upper key plates into position following the guidelines for contact and bolt locations in Step 5. All bolts should be torqued for proper tension. Refer to standard bolt torque chart and follow (lube) recommendation.

NOTE: It may require grinding of key plates to properly fit as described above.

- 7) With steps five and six completed, install the required shims under the upper lip of the jaw plate and base and weld the shim to the base. Refer to Print No. 3645-049-01.
- 8) After operating crusher for eight hours, recheck bolt tension. Retension bolts as required until they remain tight.

Pitman Plate & Jaw Wedge

- 1) Movable jaw machined surface must be checked for flatness crosswise and top to bottom in general. It must be with $\frac{1}{16}$ ", however, it will vary with each size crusher.
- 2) The pitman lip must be smooth for the jaw plate to fit evenly and tight against the lip.

General Information

3) The movable jaw plate must be centered on the pitman

NOTE: This may require trimming pitman sides or ears.

4) Install the pitman jaw wedge. Be sure it does not extend beyond the end of the pitman, restricting the pitman side float.

5) Install the keeper bolts to hold the wedge in place and their lock nuts and washer.

6) Using a minimum 16 lb. sledge hammer, you must drive on the face of the wedge starting in the center and working toward both ends to seat the wedge. While driving on wedge, a person is to be tightening the bolts and nuts in the same area.

NOTE: Do not drive on the heads of the bolts!

All bolts should be torqued for proper tension. Refer to standard bolt torque chart and follow (lube) recommendation.

7) After operating crusher for eight hours, recheck bolt tension. Retension both as required until they remain tight.

NOTE: The wedge should never bottom out against the pitman nor should the top of the wedge be in further than the pitman barrel. In either case, add a shim to top of wedge same width and length as wedge to correct.

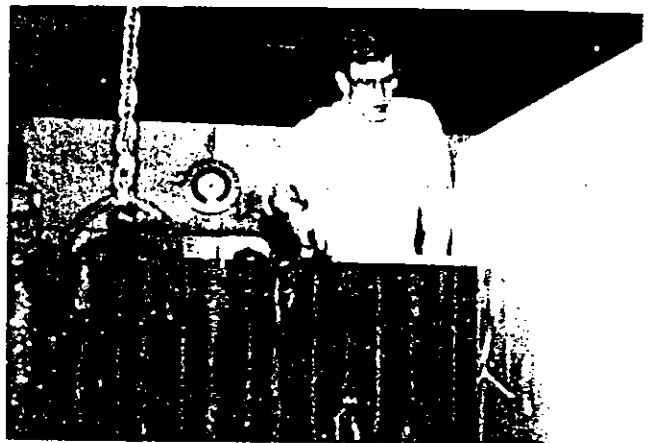


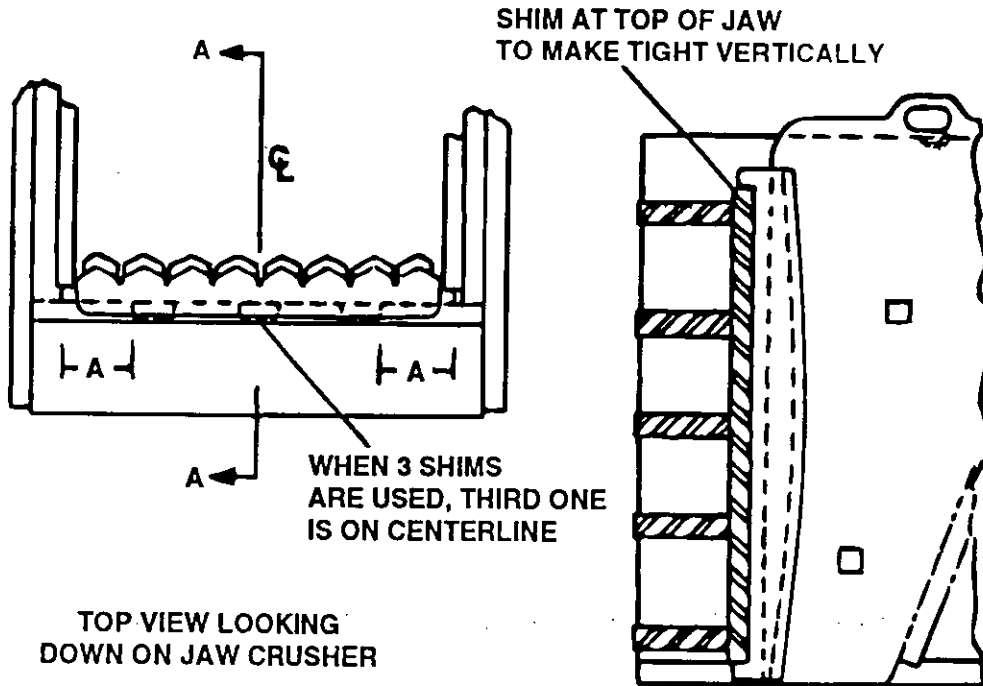
Figure 9
Proper Use of Lifting Loop on Jaw Plate



Caution! When welding mild steel lifting loops to Manganese jaw plates or key plates, American Welding Society standards are to be followed as summarized:

- Stainless 310 rod 3/8 diameter. A number of passes should be used rather than one large pass.
- No preheating or after welding heating to be done.
- Follow all safety precautions whenever lifting items.

Shim Locations



TOP VIEW LOOKING DOWN ON JAW CRUSHER

Figure 10

Top View of Jaw Crusher for Shim Location

Size	A	Shim Places	Shim Group
1016	3'	2	I
1020	3'	2	I
1024	5'	2	I
1524	5'	2	I
1824	5'	2	I
1036	5'	3	I
1236	5'	3	I
1536	5'	3	I
1636	5'	3	I
1836	5'	3	I
2236	5'	3	II
2436	5'	3	II
2442	5'	3	II
2742	5'	3	II
3046	5'	3	II
1242	5'	3	I
3042	5'	3	II
3242	9'	2	III
4242	9'	2	III
3645	5'	3	III
1648	7'	3	I
2248	7'	3	II
4248	5'	3	III
1248	7'	3	I
2438	5'	3	II
1642	5'	3	II
5460	7'	3	IV
3054	6'	3	IV
3660	7'	3	IV

Part #	Description
Shim Group I	
41306-001	1/4' FL x 2-1/2' x 1' LG
41314-001	5/16' FL x 2-1/2' x 1' LG
41321-001	3/8' FL x 2-1/2' x 1' LG
41335-001	1/2' FL x 2-1/2' x 1' LG
Shim Group II	
41306-002	1/4' FL x 2-1/2' x 2' LG
41314-002	5/16' FL x 2-1/2' x 2' LG
41321-002	3/8' FL x 2-1/2' x 2' LG
41335-002	1/2' FL x 2-1/2' x 2' LG
Shim Group III	
41307-004	1/4' FL x 3' x 4' LG
41315-004	5/16' FL x 3' x 4' LG
41322-004	3/8' FL x 3' x 4' LG
41336-004	1/2' FL x 3' x 4' LG
Shim Group IV	
41307-006	1/4' FL x 3' x 6' LG
41315-006	5/16' FL x 3' x 6' LG
41322-006	3/8' FL x 3' x 6' LG
41336-006	1/2' FL x 3' x 6' LG

Jaw Crusher Toggle Plate Changing Procedure

Caution! Never adjust toggle plate setting when crusher is being operated.

- 1) Install chain through the center hold of the toggle plate and feed it up between the pitman and the base.
- 2) Connect chain to come-along and snug up chain just so it doesn't fall back down.
- 3) Loosen the tension rod and spring assembly.
- 4) Loosen adjustable toggle plate seat wedges.
- 5) Install hydraulic rams and pump assembly.
- 6) Pump rams to push seat forward far enough to remove shims.
- 7) Release hydraulic pressure - this will allow the pitman to push the seat back.
- 8) Remove hydraulic ram(s) and relocate upper position in order to push the pitman end toward the stationary jaw.
- 9) Pump ram(s) far enough so the toggle plate drops free of the pitman.
- 10) For safety, put hard block of wood between pitman and base.
- 11) Lower the toggle plate down to the tension rods.
- 12) Lower tension rods down on to the conveyor and remove springs.
- 13) Let the toggle plate all the way down on to tension rods.
- 14) Pull plate out from under the crusher. To install new toggle plate, slight the new plate under the crusher on the tension rod.
- 15) Feed the chain backup between pitman and base and hood chain on to the come-along.
- 16) Raise the toggle plate up into the adjustable seat.
- 17) Remove the wooden block between pitman and base.
- 18) Slowly release hydraulic pressure to let pitman come back and adjust come-along as required to line toggle plate up with pitman seat.

Changing Toggle Plate

- 19) Remove ram(s) from upper position and reinstall in position to adjust crusher setting.
- 20) Raise the tension rods up in to position and install the springs and snug up assembly.
- 21) Use block of wood for desired setting of crusher and hang it down to bottom of crushing chamber.
- 22) Adjust crusher until the block of wood is tight between the pitman jaw and stationary jaw.
- 23) Install required equal amount of shims on both sides.
- 24) Release hydraulic pressure on rams. This will allow the pitman to retract forcing the shims tight against the base.
- 25) Retension the tension springs equally to insure the pitman, toggle plate and adjustable seat are all tight one against the other.
- 26) Retension the adjustable toggle plate seat wedges.



Caution! Never operate the crusher with the hydraulic cylinders under pressure.

NOTE: *If you hear or see the toggle plate slapping in its seats, the tension rod and spring assemblies must be retensioned more.*

Installation of Jaw Pitman Assembly into Base

- 1) Install the toggle plate inside the base. Use a chain through the center hole to suspend the toggle plate in the base. Make sure the chain can be dropped out through the hole after the pitman is installed.
- 2) Hook a crane to the pitman at the top and the bottom so that when the pitman is hoisted, it will be held at an angle of around 15 to 20 degrees from end to end and level horizontally from side to side. Crane(s) must be adequate for the weight of the pitman.
- 3) Lower the pitman into the base. Be careful not to bang the side of the bearing housing into the base seats.
- 4) When the bearing is 1 or 2 inches from being seated, install the bearing bolts on the bottom and top.
- 5) Start the back bearing bolts. Disconnect the chain on the top of the pitman.
- 6) Before unhooking the lower chain from the pitman, lift the pitman and raise the toggle plate into position. Then remove the chain.
- 7) Tighten the bearing housing to the base. Tighten the back bolts first (the tension spring end). This draws the side bearing housing to the rear. Tighten the

- bottom bolts second. This ensures the assembly is down tight. Tighten the top bolts last in a corner-to-corner or criss-cross pattern.
- 8) Torque all housing bolts to the recommended value.
 - 9) Check and record the clearance between the outside rotating seal and the side bearing end cap for future reference. This clearance should be very close to equal all the way around.
 - 10) Install the tension rods and spring assemblies. Compress both springs evenly until there is no looseness between the pitman seat, the toggle plate, and the adjustable seat.
 - 11) Install the flywheels onto the shaft.

Note: Be sure the counterweights on the flywheels are in line from side to side and ahead of the leading spoke as it rotates down into the closed stroke.

12) Tighten the shaft's end cap bolts first to push the flywheels onto the shaft.

13) Tighten the flywheel hub bolts last.

Note: Number 12 and number 13 bolts should be torqued to the recommended value of the torque chart, using the "LUBE" column of the chart.

Size	Old Part #	Description	New Part #	Description	Qty.
2236	7146-196	1-1/4" N.C. x 15"	7383-324	1-1/4" N.C. x 16"	8
2542	7146-196	1-1/4" N.C. x 15"	7383-324	1-1/4" N.C. x 16"	8
2742	7146-196	1-1/4" N.C. x 15"	7383-324	1-1/4" N.C. x 16"	8
3042	7146-196	1-1/4" N.C. x 15"	7383-324	1-1/4" N.C. x 16"	8
3054	7146-196	1-1/4" N.C. x 15"	7383-324	1-1/4" N.C. x 16"	8
3242	7146-196	1-1/4" N.C. x 15"	7383-324	1-1/4" N.C. x 16"	8
4242	7146-196	1-1/4" N.C. x 15"	7383-324	1-1/4" N.C. x 16"	8
3648	3645-049-02	1-1/2" N.C. x 19" (Stud)	7383-325	1-1/2" N.C. x 18-1/2"	8
3660	3645-049-02	1-1/2" N.C. x 19" (Stud)	7383-325	1-1/2" N.C. x 18-1/2"	8
4248	3645-049-02	1-1/2" N.C. x 19" (Stud)	7383-325	1-1/2" N.C. x 18-1/2"	8
5460	4248C04	1-1/2" N.C. x 21-1/2" (Stud)	7383-326	1-1/2" N.C. x 20"	8

Torque bolts per Standard Torque Chart. Use Lubricated column figure.

Jaw Crusher Shielding & Lubricating Pitman Toggle Plate & Seat to Reduce Wear

During jaw crusher operation, fine dust generated by the process accumulates on top of the toggle plate and works its way in between toggle plate and seat. The addition of lubricant to that area produces a combination of oil and dust which acts like a grinding compound to speed up the wearing of toggle plate and seat.

We recommend a burlap shield and oil wick that will trap the dust and bleed clean oil into the contact area so that wear is minimized.

- 1) Cut burlap strips, wide enough to nest in area above toggle seat, on low point of toggle plate as shown. Strips should be as long as the crushing chamber is wide.
- 2) Cut at least ten strips, laying them one on top of each other to form a laminated shield. Saturate the strips with old engine oil.
- 3) Install shield on top of pitman toggle seat and toggle plate contact area as shown.

Maintenance:

- 1) Check shield periodically.
- 2) When top strip is saturated with dust, carefully peel it off.
- 3) Add old motor oil to shield after each top strip is removed.
- 4) Remove entire shield before the last two strips are removed.

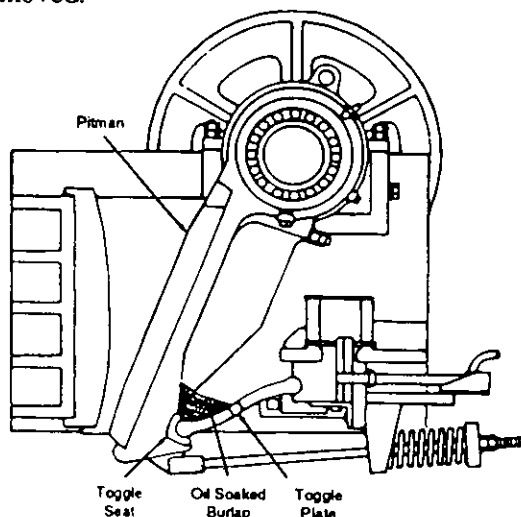


Figure 11
Cut-away Side View of Typical Jaw Crusher
with Burlap Dust Shield

Pitman Information

Pitman Assembly Procedure

- 1) All pitman and side bearing end cap bolts are to be of the self locking type and Loctite #271 is also to be applied. Then tighten bolts to correct torque.
- 2) All seals with grooved lands should be packed with proper grease when assembling. After assembly, purge seal on grease lubricated unit, then remove grease fitting for seals and install plugs.
- 3) In removing clearance from bearings follow these guidelines:

Straight Bore Pitman Bearings: Be sure no more than 50% of the unmounted clearance is removed after the bearings have cooled and shrunk in place on the shaft.

Tapered Side Bearings: Remove between 40 and 50% of the unmounted clearance, no more.

Example: Unmounted bench clearance = .010; 40% = $.010 \times 0.4 = .004$; 50% = $.010 \times 0.5 = .005$; Then $.010 - .004 = .006$; $.010 - .005 = .005$. Record all unmounted and mounted clearances for future reference.

- 4) Proper lubrication for jaw crusher should follow guidelines established in IMCO 010 Operation & Maintenance Manual until notified differently by factory.

Be sure to add 20% grease just like new unit in an overhaul.

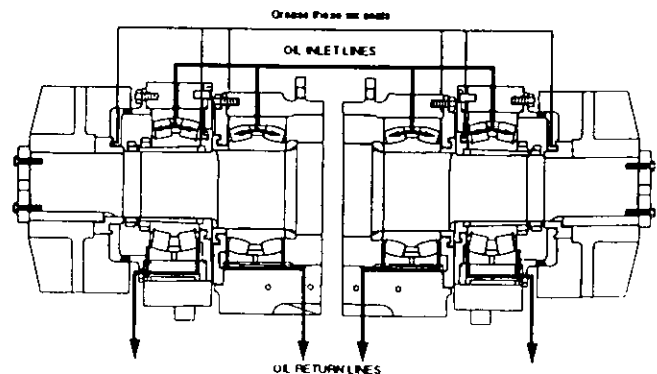


Figure 12
Pitman Oil Lubricating System

Lubrication

Pitman and Side Bearings: Fill supply tank with recommended lubricants. See Operation Manual for the oil capacity. **Lubricant:** Extreme pressure type oil. Typical brand names are, Amoco Amogear EP (220) [150], Mobil Mobilgear (630) [629], Exxon Spartan EP

Pitman Information

(220) [150], Shell Omala (220) [150], Gulf EP Lube HD (220) [150], Texaco Meropa (220) [150]

Ambient Oil Temperature Guide: (Above 32°F) [Below 32° F]

Use ISO Viscosity Grade 68 of primary lubricant for flushing.

Every 1000 hours, drain the supply tank and fill with flushing oil. Proceed with flushing operation. See specific instruction in the Operation Manual.

Grease Fittings: Dust & Moisture seals. Grease must extrude from seals at all times to produce an effective dust and moisture seal. Greasing intervals must be established to maintain this visible grease slick. **Lubricant:** Lithium base, grade 2 grease.

Contaminants in Lubricants

The following is a guide to levels of contaminants in lubrication. This is the concerned range measured in parts per million (ppm).

Iron: 125-150, Chrome: 25-30, Aluminum: 45-50, Copper: 100-125, Silicon: 25-30, Water: 0.

Oil is to be changed every 1000 hours. (Shorter intervals if at elevated temperature or continuous operation)

Refer to Cedarapids Operation & Maintenance Manual for bearing grease capacities and other detailed lubrication instructions.

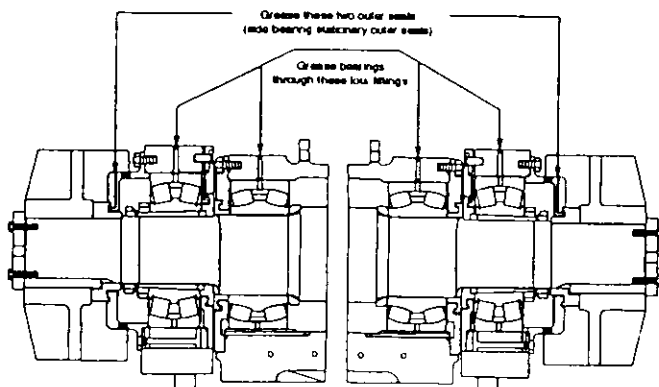


Figure 13
Grease Fittings on Pitman

Pitman Grease Fittings

Pitman and Side Bearings: Grease must extrude from seals at all times to produce an effective dust and moisture seal. Greasing intervals must be established to maintain this visible grease slick. Typical brand names are Amoco Amolith EP1, Gulf Gulfcrown EP1, Shell Alvania EP1, Exxon Lidok EP1, Mobil Mobilux EP1, Texaco Multifak EP1.

Refer to Cedarapids Operation & Maintenance Manual for bearing grease capacities and other detailed lubrication instructions.

Setting Oil Lubricating Flow Switches

- 1) Run the oil lubrication system without the crusher running.
- 2) Open flow switches all the way open.
- 3) Allow enough time for oil to warm up.
- 4) Adjust the three highest switches back down to the lowest switch setting.

Notes:

- As the higher ones are backed down the low ones will raise some.
- The flow switch brass indicator settings will vary with each size of crusher due to pump output.
- If indicator(s) begin to lower their preset position, it could indicate oil line problems or a bearing beginning to fail.
- If excessive oil leaks out of the seals, possible causes are: lack of grease in seals, return line blockage, return line has low area trapping oil fluid restricting flow to reserve or oil flow rate is too high and the flow rate indicator needs to be lowered.
- Oil is to be drained and flushed every 1000 hours of operation or seasonally, whichever occurs first.



Caution! Never operate oil lubricated crusher without the alarm system in operation.

Lubrication Instructions

Oil Lubrication for Combination Grease or Oil Lubricated Crusher

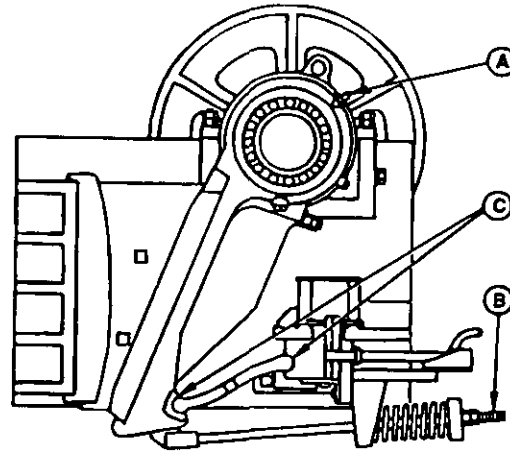


Figure 14
Side View – Location of Dust Barrier Grease Fittings & Oil Hoses

Grease these six seals

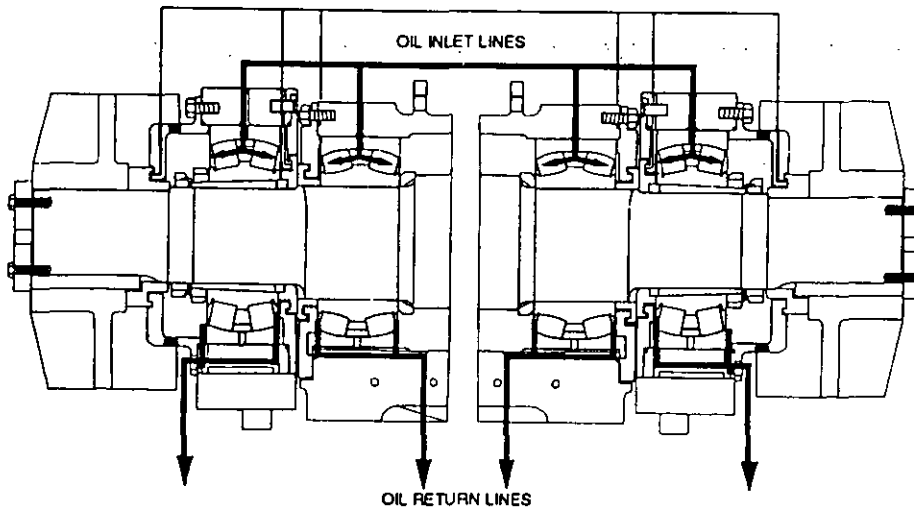


Figure 15
Cut-away Front View – Location of Dust Barrier Grease Fittings & Oil Hoses

SYMBOL	PART	INSTRUCTIONS	LUBRICANT RECOMMENDED
A	Side Bearing Seals, Pitman Seals (Dirt Barriers)	Check daily. Grease must extrude from the seals at all times to produce an effective dust and moisture seal. Greasing intervals must be established to maintain this visible grease slick.	Lithium base, Grade 2 grease
B	Tension Rod Threads	Lubrication with oil as needed.	SAE 30 motor oil
C	Toggle Plate	Lubricate at reassembly.	Lithium base, Grade 2 grease
D	Oil Circulation System	Every 1000 hours or seasonally, whichever occurs first. Drain when hot. Flush with at least 10 gallons flushing oil, run empty, drain and refill.	Amoco Amogear EP 220 or 150* Exxon Spartan EP 220 or 150* Gulf EP Lube HD 220 or 150* Mobil Mobilgear 630 or 629* Shell Omala 220 or 150* Texaco Meropa 220 or 150* *Use lower number for temperatures below freezing.

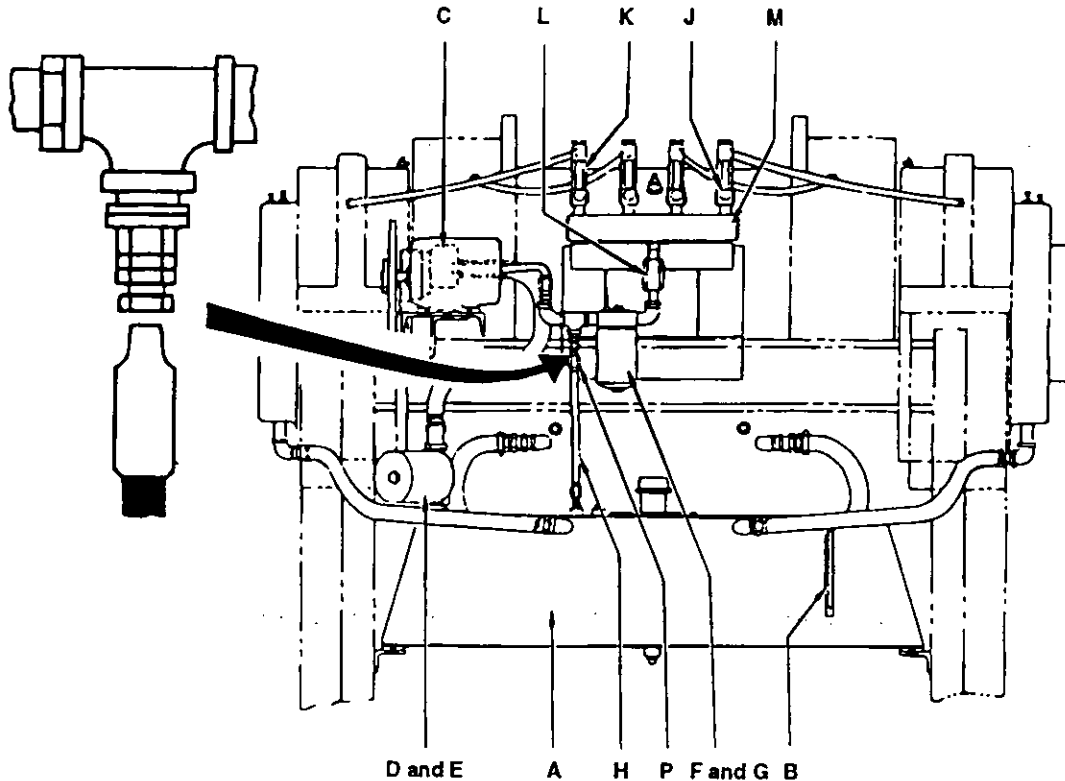
**Circulating Oil System
Electric Oil Pump Drive**

Figure 16
Circulating Oil System Components - Rear End View of Crusher with Electric Oil Pump Drive

Item Descriptions

- A Oil reservoir
- B Level gauge
- C Oil pump
- D & E Suction filter with gauge
- F & G Discharge filter with gauge
- H Relief line
- J Pressure oiler
- K Flow indicator tube
- L Check valve
- M Oil manifold
- P Relief valve

Supply Tank & Level Gauge

A large supply tank (A) for the oiling system is mounted on the crusher frame. It is set lower than the pitman shaft bearings so that oil draining from each bearing will return by gravity flow to the tank for re-circulation.



Caution! It is vital that all four drain hoses be without a low point where oil could collect and congeal during cold weather so that drainage back to the supply tank would be slowed or blocked.

A sight gauge (B) on the side of the tank shows the level of oil. The tank size is dependent upon the crusher size as follows: 3648, 4248, 3660 & 5460 crushers have a 25 gallon tank while 3242 and smaller crushers have a 20 gallon capacity.

Use an extreme pressure type oil with the proper viscosity grade. Typical brand names are: Amoco Amogear EP, Exxon Spartan EP, Gulf EP Lube HD, Mobil Mobilgear, Shell Omala, Texaco Meropa. Viscosity should be 220 with ambient temperatures above 32°F and 150 with temperatures below 32°F. (Mobil 630 and 629)

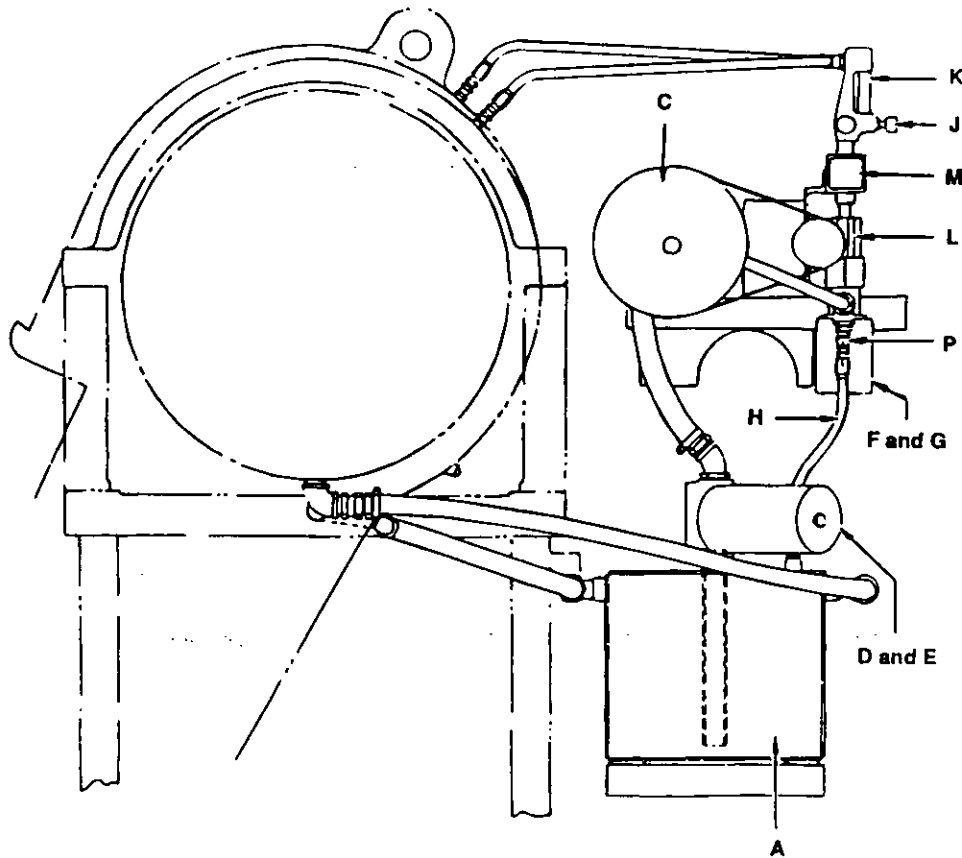
**Circulating Oil System
Flywheel Pump Drive**

Figure 17
Circulating Oil System Components - Left Side View of Crusher with Flywheel-to-Pump Drive

Item Descriptions

- A Oil reservoir
- C Oil pump
- D & E Suction filter with gauge
- F & G Discharge filter with gauge
- H Relief line
- J Pressure oiler
- K Flow indicator tube
- L Check valve
- M Oil manifold
- P Relief valve

Oil Pump

The oil pump (C) picks up oil from the tank and forces it through the distribution system to the top of each of the four main roller bearings. When the oil reaches the bottom of each bearing it flows by gravity back to the supply tank. Oil which reaches the central gravity of the pitman, after having passed through the pitman bearings, also flows back to the supply tank. In this way a continuous circulation of oil over all bearing rollers takes place whenever the crusher drive is operating.

System Filters

Two filters are used in the lubrication system, a suction-line filter (D) above the reservoir (A) and a discharge-line filter (F) below the oil manifold, (M).

The suction filter has a reusable 100-mesh wire cloth element to prevent particles from reaching the pump. The discharge filter has a 25-micron disposable element which prevents even the smallest particles from being carried to the bearings. Each filter has an internal bypass which assures oil flow even if the element is plugged.

A 75 psi external relief valve is included in the inlet to the discharge filter to prevent damage if oilers become plugged or are shut off.

If there is a drop in volume at pressure oilers, (J) this may be an indication filters are clogged.

The reusable filter should be cleaned seasonally and the disposable filter changed when oil is changed. Under excessive dust conditions, filters should be checked periodically.

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Check Valve

A check valve (L) in the oil feed line to the flow indicators prevents any reverse flow of oil in the feed line. This assures instant discharge of fresh oil into each bearing as soon as crusher operation begins again.

Flow Adjustment

The control knobs (J) regulate the oil flow to the bearings. To adjust them, allow the crusher to run until the oil is warmed up. Fully open all knobs. The brass indicators will be at their highest points in the tubes (K). Then close the valves until all the indicators are at the same level.

Periodically check the level. If the level falls evenly or in one or two of the tubes, it could be a sign of bearing problems or clogged filters.

During normal operation the relief line (I) returns excess oil to the reservoir.

Filters and Pressure Gauges

The discharge filter gauge (G) shows the pressure in the feed line to the filter (F) and flow control unit (J). The gauge will indicate a pressure but the readings will vary with ambient temperature, type of lubricant, operating temperature, etc.

Suction gauge (E) will normally show little or no reading.

Dust Barrier Grease Requirement

Circumferential grease passages around the outer side of each bearing cap and retaining ring serve as dust barriers and oil retainers when they are kept full of grease. Regular injection of grease at the six fittings (A) Figure 16 will force trapped dirt and dust particles outward and keep the lubricating oil from leaking to the outside. Any grease which is forced inward and manages to reach the oil cavity on the inner side of the assembly merely displaces some oil and eventually adds to the overall lubrication of the bearings.

Grease these fittings as often as necessary to keep a slick of grease extruding from each barrier so that all dust and dirt are kept out and oil leakage is minimized. Use a lithium base, grade 2 grease.

Heating Oil Prior to Start-up

During periods of cold weather the system should be observed closely for pump V-belt slippage or pump cavitation (failure to pump oil even though pump is being driven). If no oil flow is visible through flow indicators (K) when the crusher flywheels are turning, there will eventually be a lack of the required lubrication at each

Circulating Oil System Flywheel Pump Drive

bearing. A pre-heating of the oil in the supply tank will help to minimize the problem.



Caution! Do not heat oil by applying a torch flame directly to the sides or bottom of the supply tank. Extreme heating will carbonize the oil and create serious operating problems.

Draining and Flushing System

Each 1000 hours of crusher operation or seasonally, whichever occurs first, drain the supply tank. Remove the screen from suction filter (D) and clean it. Reinstall the filter screen. Add at least 10 gallons of flushing oil to the supply tank. Run the crusher empty for at least 10 minutes, then stop the drive and drain the flushing oil. If it appears extremely dirty, repeat the flushing with fresh oil to remove more of the contaminants.

When the flushing has been completed, install a new element in the pump discharge line filter (F). Remove and clean the filter screen in suction filter (D). Reinstall the screen. Refill the supply tank to normal operating level with the lubricant recommended.

Oil Pump Drive (Flywheel Drive)

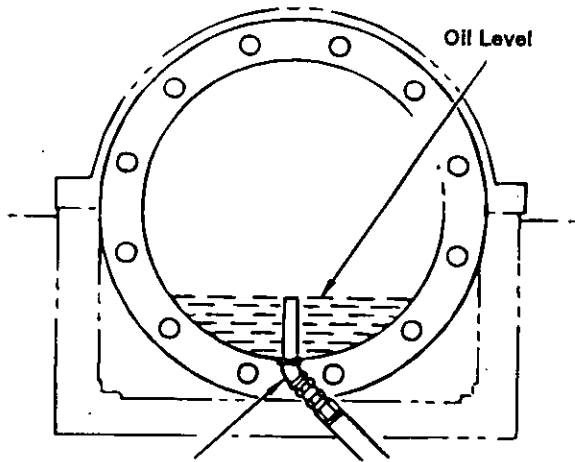
Some early lubrication system pumps were driven by belt from the flywheel. These had a link-type belt which could be replaced without removing the flywheel. A turnbuckle maintains belt tension by pivoting the pump bracket.

The belt should be kept only tight enough to drive the pump without slippage when the oil is cold at start-up. Over-tightening can cause rapid belt wear.

Oil Pump Drive Belt (Electric Motor Drive)

Maintain normal V-belt tightness by adjusting motor position. V-belt should be kept only tight enough to drive the pump without slippage when oil is cold at crusher start-up. Over-tightening will cause rapid V-belt wear.

**Circulating Oil System
Standpipe & Oil Level (Early Models Only)**



Standpipe and Drain Fitting
(Used on serial numbers preceding 38760)
End View of Side Bearing Showing Standpipe & Oil Level

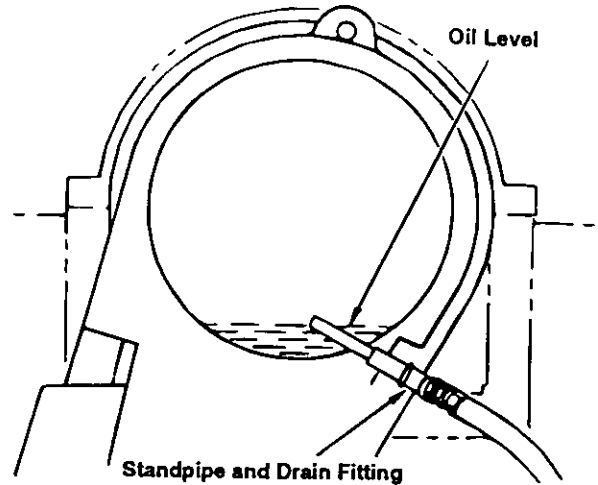


Figure 18

Standpipe and Drain Fitting
(Used on serial numbers preceding 38760)
End View of Pitman Showing Standpipe & Oil Level



Caution! Pitman Shaft Removal: The oil standpipes in the pitman must be unscrewed and removed before the shaft assembly with bearings can be withdrawn from the pitman. If this is not done, the standpipes will be severely damaged as shaft and bearings are withdrawn.

Oil Level Standpipes

All crushers (except model 5460) that precede serial number 38760 have two oil level standpipes in the pitman. (Figure 18) Model 3648 and smaller crusher also have an oil level standpipe in each of the side bearing end caps. These standpipes keep a small amount of oil covering the bottom of each bearing at all times. The maintenance of this oil supply assures the proper lubrication of each bearing at the moment of start-up. Also, if the oil pump fails the bearings will still be adequately lubricated for a reasonable length of time.



Caution! Routinely check the pressure system during each day's operation so that any interruption in the oil flow can be spotted quickly and restored. Shut down the crusher immediately if the oil flow is interrupted. The residual oil supply is not sufficient to last for long periods.

Pitman Shaft Removal - The oil standpipes in the pitman must be unscrewed and removed before the shaft assembly with bearings can be withdrawn from the pitman.

Lubricating Stored Equipment

Idle equipment whether new or used, must be turned over at least every 30 days either by power or hand to redistribute the lubricant. Revolving the bearing assemblies periodically insures lubricant on all surfaces of the bearing.

Failure to rotate bearings when crusher is idle will permit lubricant to drain to the bottom of the bearing assembly and by the collection of moisture through condensation will set up a chemical reaction in the bearing assemblies know as corrosive staining. These stained areas are a positive point for premature bearing failures, as flaking will start at these points when the equipment is put back into operation.

Circulating Oil System Low Oil Flow Alarm System

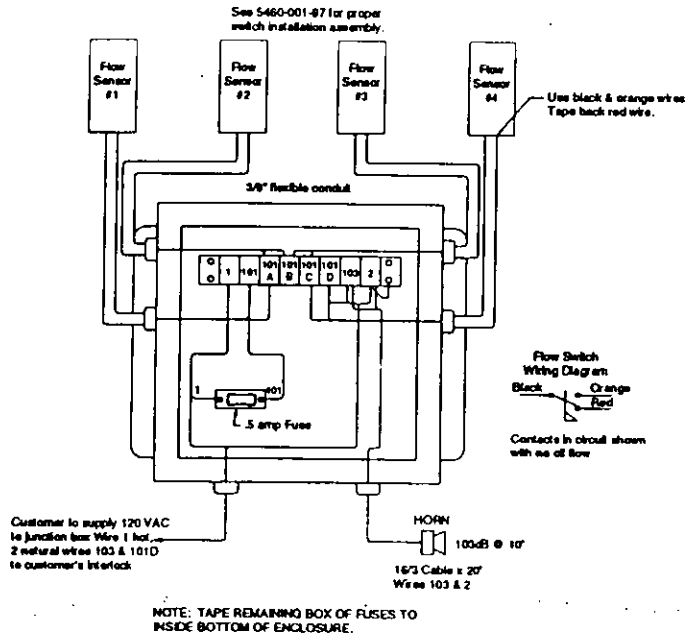


Figure 19
Wiring Diagram for Optional Low Flow Alarm System

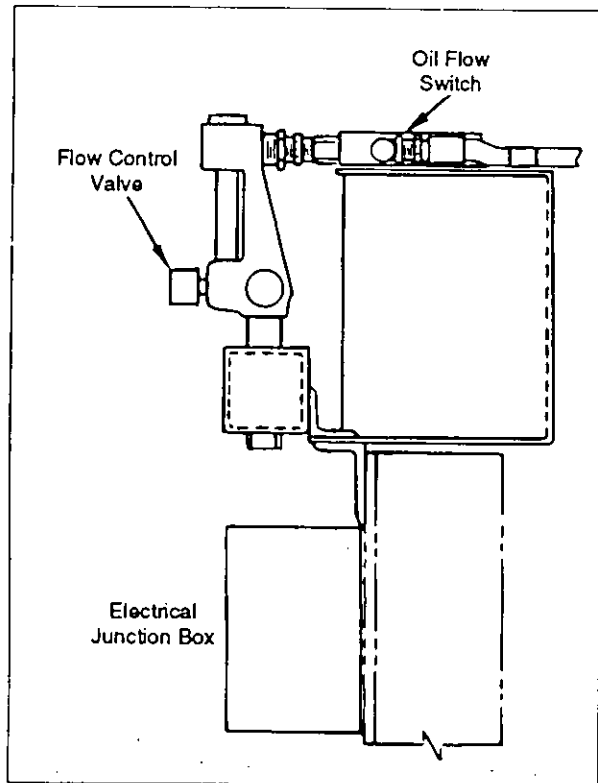


Figure 21
Location of Oil Flow Detection Switch

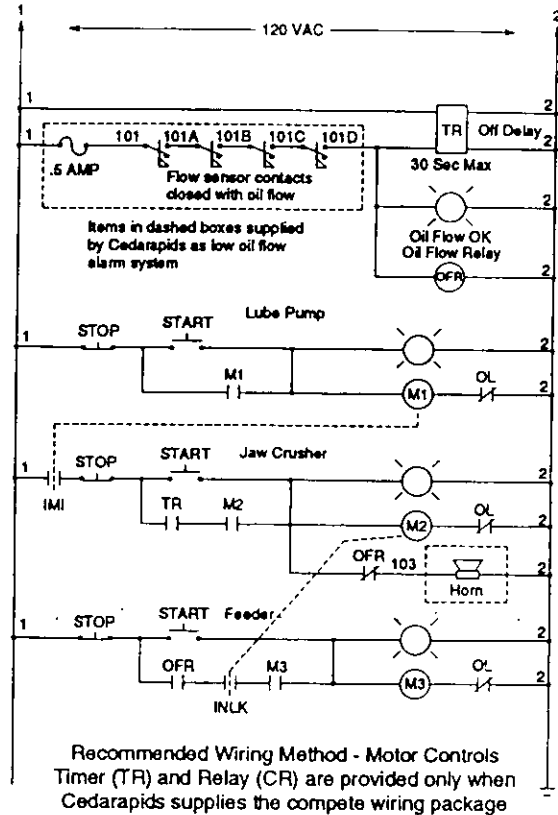


Figure 20
Schematic for Optional Low Flow Alarm System

Note: Flow sensors have normally closed contacts that open up as flow is sensed. The alarm will sound when there is a loss of oil flow.

Optional Low Oil Flow Alarm (Figures 19-21)

All jaw crushers equipped with circulating oil lubrication systems can be equipped with an electric alarm to warn of inadequate oil flow to one or more bearings. A flow sensor is installed between each flowmeter and the crusher bearing it serves. A set of electrical contacts is closed by oil flowing through the device.

When oil is flowing to all four crusher bearings, the "Oil Flow OK" light will be on, the OFR relay will be energized, allowing the feeder to run and the TR timer will close, allowing the crusher to run (Figure 20).

If any switch opens due to a no-flow condition, the oil flow relay will drop out, the feeder will stop, the horn will sound, and the "Oil Flow OK" light will go out, warning the operator of an oil flow problem. This condition will remain until the oil flow is reestablished.

If the alarm sounds for the time set on the timer, the crusher will stop.

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Jaw Crusher Tool Listing

Model	Sleeve Type	Removal Nut	Tightening Nut	Wrench
1016	Push	369	7031 021	45500 752 03
1020X	Push	569	569B	45500 752 09
1020W	Pull	569A	569C	45500 752 09
1024	Push	569	569B	45500 752 09
1024W	Pull	569A	569C	45500 752 09
1036B	Push	697	697B	45500 752 09
1036D	Pull	697A	896	45500 752 09
1036	Pull	697A	896	45500 752 09
1236	Pull	697A	896	45500 752 09
1236	Pull	4418 238	4418 237	45500 752 09
1242	Pull	896	897	45500 752 09
1248	Pull	896	897	45500 752 09
1424	Pull	895	896	45500 752 09
1524	Pull	697BA	697 01	45500 752 09
1524	Push	697	697B	45500 752 09
1536	Push	895	896	45500 751 09
1624	Pull	569D	569E	45500 751 09
1636	Pull	896	897	45500 751 09
1642	Pull	946	4418 115	45500 751 10
1648	Pull	947	946	45500 751 10
1824	Push	697	697B	45500 751 09
1830	Push	895	896	45500 752 09
1836	Push	895	896	45500 752 09
2025	Pull	896	897	45500 752 09
2036	Pull	896	897	45500 752 09
2225	Pull	896	897	45500 752 09
2236	Pull	896	897	45500 752 09
2248	Pull	946	4418 115	45500 751 10
2436	Pull	946	4418 115	45500 751 10
2540	Pull	946	947	45500 751 10
2540	Push	947	946	45500 751 10
2542	Pull	947	946	45500 751 10
2640	Pull	946	4418 115	45500 751 10
2742	Pull	946	4418 115	45500 751 10
3040	Push	946A	946	45500 751 10
3040	Pull	946	4418 115	45500 751 10
3042	Push	946A	946	45500 751 10
3042	Pull	946	4418 115	45500 751 10
3054	Pull	946	4418 115	45500 751 10
3240	Pull	946A	946	45500 751 10
3242	Pull	946	4418 115	45500 751 10
3648	Pull	4418 172	4418 170	45500 751 16
3660	Push	4418 180	4418 189	45500-751-20
4242	Pull	946	4418 115	45500 752 10
4248	Push	4418 189	4418 189	45500-751-20
5460	Pull	5460 002 34 5460 002 35	5460 002 34 5460 002 35	01376AXA
Twin Jaw Crushers				
1216	Pull	370	569B	45500 751 09
1236	Pull	397A	896	45500 751 09
1624	Pull	569D	569E	45500 751 09
1836	Pull	896	897	45500 751 09
Dual Jaw Crushers				
1840/640	Pull	896	897A	45500 751 09
Gyra Jaw Crushers				
1072	Pull	947	946N	45500 751 10

Crusher Operation Problems**Feed too large**

Pounding or crushing on pitman barrel and pitman bearing housings can cause short bearing life.

Feed too small

Excessive wear on bottom end of jaw plates. No wear in center area of jaw plates. Good manganese wasted.

Feeding material in excess of 35,000 - 40,000 PSI

Rock too hard can cause shaft breakage, bearing failure, base breakage and bolt fractures.

Setting crusher below minimum setting

Excessive wear on top of pitman, excessive wear on bottom of jaw plates. Overstressing shaft and bearing assemblies causing either or both shaft and bearing failure.

Choke feeding crusher

Excessive load on shaft and bearings. Excessive wear on pitman barrel. Excessive wear on feed hopper. Normal feed rate is to maintain 80% of jaw chamber.

Operating crusher too slowly

Make crusher too aggressive and end up overloading shaft, bearing and base, causing early failure.

Operating crusher too fast

No allowing enough time for jaw plates to grip the rock to break it. Excessive scrubbing wear action on jaw plates, shortening their life.

Operating at minimum setting short toggle plate & worn jaw plate

Excessively overloading stressing shaft.

Not centering movable jaw plate on pitman & in between key plate

Restricts the lateral movement of pitman. Stress loading bearings assembly causing excessive heat and early bearing failure. Possible shaft failure.

Operating with movable jaw plate rubbing on key plate due to movable jaw plate growth

Restricts lateral movement of pitman. Stress loading bearing assembly, causing excessive heat and early bearing failure. Possible shaft failure.

Crusher Operation Problems**Operating with worn jaw plates**

Pounding of jaw plates into base and pitman causing excessive wear on base and pitman. Depending on amount of wear, could over-stress shaft and bearings, causing either or both shaft and bearing failure.

Operating with two flat face jaw plates - no configuration

Excessive stress on shaft in hard rock application. For use in soft rock only.

Operating with two straight face jaw plates with configuration

Rapid wear on lower end of jaw plates.

Operating with unequal amount of shims behind the adjustable toggle seat

Over-stress of the toggle plate causes early failure of seat. Over-stress of one side of pitman and tension rod causing failure of tension rod and/or tension springs. Also causes uneven wear in toggle seats plus the toggle plate.

Toggle seat wedges loose

Will cause excessive wear on wedges, seat and base. Could cause toggle plate failure.

Operating with worn toggle seats

Will cause toggle plate to have uneven wear and early failure as well as toggle seat and crusher base damage.

Over-tensioning one rod and spring assembly

Will carry majority of load and fail prematurely.

Flywheel loose on shaft

Damage keyways and shaft. Most important, loose lateral tightness for rotating seal which could cause contaminants to enter the bearing.

**Jaw Crusher
Jaw Plate Assembly Procedure****Base Stationary Jaw & Key Plates**

- (1) Stationary jaw machined surface must be checked for flatness both crosswise and top to bottom. It must be within $\frac{1}{16}$ ".
- (2) Stationary jaw must be centered in base and must be held tight upwards against the bottom end of the base and while in this position.
- (3) Lower key plates are installed and then a $\frac{3}{4}$ " or 1" spacer bar is set on top of the lower key plate and the upper key plate is installed.
- (4) Using a minimum of a 16 lb sledge hammer, you drive on the upper key plate forcing the lower key plate down tight in place.
- (5) A properly fitting key plate will have a minimum of 70% contact between the base guide and the ear of the jaw plate. At the same time, the bolts that hold the key plates in the base should be between $\frac{1}{2}$ way and the upper $\frac{3}{4}$ of the slotted hole in the base. At no time should the bolts contact either end of the base hole.
- (6) After the lower key plates are in position, remove the spacer and drive the upper key plates into position following guidelines for contact and bolt locations as in step (5).

NOTE

It may require grinding of key plates to properly fit as described above.

- (7) With steps (5) & (6) completed, install the required shims under the upper lip of the jaw plate and base and weld the shims to the base. Refer to print #3645-049-01.

Pitman Jaw Plate & Key Wedge

- (1) Movable jaw machined surface must be checked for flatness both crosswise and top to bottom. It must be within $\frac{1}{16}$ ".
- (2) The pitman lip must be smooth for the jaw plate to fit evenly and tight against the lip.
- (3) The movable jaw plate must be centered on the pitman.
- (4) The jaw wedge must be installed and be sure it does not extend beyond the end of the pitman, restricting the pitman slide float.
- (5) Install the keeper bolts, locknuts and washer to hold the wedge in place.
- (6) Using a minimum of a 16 lb sledge hammer, drive on the face of the wedge, starting in the center and working towards both ends to seat the wedge. While driving on wedge, a person is to be tightening the bolts and nuts in the same area.
- (7) At no time should the jaw wedge be driven in deeper than the pitman barrel surface. If it goes in too deep, remove it and add a shim on top of the wedge the same width and length of wedge and then reset it.

NOTE

The wedge should never bottom out so there is no room left to draw it tighter.

Jaw Crusher
Standard Jaw Configuration

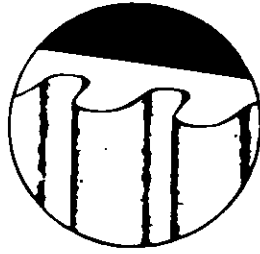
STANDARD JAW CRUSHER CONFIGURATION							
Model	Stationary Jaw Style	Movable Jaw Style	Tooth Type	Model	Stationary Jaw Style	Movable Jaw Style	Tooth Type
1016	Straight	Regular Curve	E	2248	Regular Curve	Bellied	FA
1020	Bellied	Regular Curve	E	2436*	Regular Curve	Bellied	EP
1024	Bellied	Regular Curve	E	2438†	Regular Curve	Bellied	FA
1036	Bellied	Regular Curve	FA	2542	Regular Curve	Bellied	FA
1236	Bellied	Regular Curve	FA	2742	Regular Curve	Bellied	FA
1242	Bellied	Regular Curve	FA	3042	Regular Curve	Bellied	FA
1248	Bellied	Regular Curve	FA	3054**	Bellied	Bellied	FA
1524	Straight	Regular Curve	F	3242	Bellied	Regular Curve	FA
1636	Bellied	Regular Curve	FA	3648	Bellied	Regular Curve	FA
1642*	Bellied	Regular Curve	FA	3660**	Bellied	Bellied	FA
1648	Bellied	Regular Curve	FA	4242‡	Bellied	Regular Curve	FA
1824	Straight	Regular Curve	F	4248	Bellied	Regular Curve	FA
1836	Regular Curve	Bellied	FA	5460	Straight	Straight	FA
2236	Regular Curve	Bellied	FA	5748‡	Bellied	Regular Curve	FA

*Hard Rock **Recycle †Limestone ‡Rip-Rap

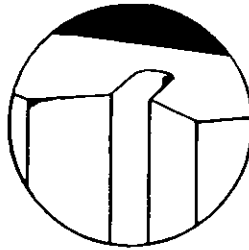
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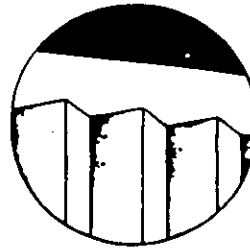
Crusher Jaws - Welded Base Standard & Special



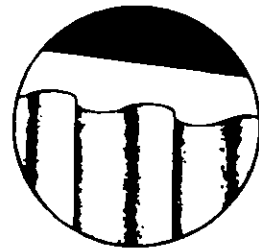
TYPE 'FA'
ROUND TOOTH
DEEP CORRUGATION



TYPE 'EP'
POINTED TOOTH



TYPE 'E'
POINTED TOOTH



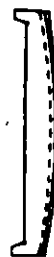
TYPE 'F'
ROUND TOOTH



STRAIGHT
FACE



REGULAR
CURVE



BELLIED



FULL
BELLIED

STATIONARY JAW



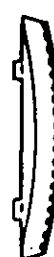
STRAIGHT
FACE



REGULAR
CURVE



BELLIED



FULL
BELLIED

MOVABLE JAW

SINGLE OVERHEAD ROLLER BEARING CRUSHER

WELDED BASE	STATIONARY				MOVABLE				
	Model Number	Part Number	Style Tooth	Pitch (Inch)	Profile	Part Number	Style Tooth	Pitch (Inch)	Profile
1016	1020	302	E	1-1/2	Straight	303B	E	1-1/2	Reg Curve
						305T			Full Bellied
						403			Reg Curve
1024	502	E	1-1/2	Bellied	405	E	1-1/2	Full Bellied	
					503			Reg Curve	
					505			Full Bellied	
1036	602L	F	2	Bellied	603SS	F	2	Reg Curve	
	602LH	F	2	Bellied	605SS	F	2	Full Bellied	
	602UA	EP	3	Wedge	603SS	F	2	Reg Curve	
	1036-049-01	FA	3-3/8	Bellied	605SS	F	2	Full Bellied	
	1036-049-05	FA	3-3/8	Reg Curve	603UA	EP	3	Straight	
	1036-049-06	FA	3-3/8	Full Bellied	603VA	EP	3	Full Bellied	
					1036-049-02	FA	3-3/8	Bellied	
					1036-049-03			Full Bellied	
					1036-049-04			Reg Curve	
					1036-049-02	FA	3-3/8	Bellied	
					1036-049-03			Full Bellied	
					1036-049-04			Reg Curve	
					1036-049-02	FA	3-3/8	Bellied	
					1036-049-03			Full Bellied	
					1036-049-04			Reg Curve	

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**Crusher Jaws - Welded Base
Standard & Special**

SINGLE OVERHEAD ROLLER BEARING CRUSHER								
WELDED BASE	STATIONARY				MOVABLE			
Model Number	Part Number	Style Tooth	Pitch (Inch)	Profile	Part Number	Style Tooth	Pitch (Inch)	Profile
1236	1236X01	F	2	Bellied	1236X02	F	2	Reg Curve
	1236X03	EP	3	Bellied	1236X04 1236X06	EP	3	Reg Curve Bellied
	1236X05	EP	3	Wedge	1236X04 1236X06	EP	3	Reg Curve Full Bellied
	1236-066-01	FA	3-3/8	Bellied	1236-066-02 1236-066-04 1236-066-05	FA	3-3/8	Full Bellied Reg Curve Bellied
	1236-066-03	FA	3-3/8	Reg Curve	1236-066-02 1236-066-04 1236-066-05	FA	3-3/8	Full Bellied Reg Curve Bellied
	1236-066-06	FA	3-3/8	Full Bellied	1236-066-02 1236-066-04 1236-066-05	FA	3-3/8	Full Bellied Reg Curve Bellied
1524	702L	F	2	Straight	703L 705A01	F E	2	Reg Curve Full Bellied
	9001-344	EP	3	Bellied	9001-345	EP	3	Reg Curve
1830	1830B01	F	2	Straight	1830B02	F	2	Reg Curve
1836	1636-050-20	EP	3	Bellied	1636-050-21 1636-050-22	EP	3	Straight Bellied
	1636-050-23	FA	3-3/8	Bellied	1636-050-24 1636-050-28 1636-050-29	FA	3-3/8	Full Bellied Bellied Reg Curve
	1636-050-27	FA	3-3/8	Reg Curve	1636-050-24 1636-050-28 1636-050-29	FA	3-3/8	Full Bellied Bellied Reg Curve
2025	2025A04	E	2	Bellied	2025A05	E	2	Bellied
2036	802D	E	2	Straight	803D 805B	E	2	Straight Bellied
	802-01	EP	3	Bellied	803DA 805C	EP	3	Straight Bellied
	802DB	EP	3	Wedge	803DA 805C	EP	3	Straight Bellied
	2236-006-10	FA	4-3/8	Reg Curve	2236-006-11 2236-006-13	FA	4-3/8	Reg Curve Bellied
	2236-006-12	FA	4-3/8	Bellied	2236-006-11 2236-006-13	FA	4-3/8	Reg Curve Bellied
2225	2025A04	E	2	Bellied	2025A05	E	2	Bellied

**Crusher Jaws - Welded Base
Standard & Special**

SINGLE OVERHEAD ROLLER BEARING CRUSHER								
WELDED BASE	STATIONARY				MOVABLE			
	Model Number	Part Number	Style Tooth	Pitch (Inch)	Profile	Part Number	Style Tooth	Pitch (Inch)
2226	802D	E	2	Straight	803D 805B	E	2	Straight Bellied
	802-01	EP	3	Bellied	803DA 805C	EP	3	Straight Bellied
	802DB	EP	3	Wedge	803DA 805C	EP	3	Straight Bellied
	2236-006-10	FA	4-3/8	Reg Curve	2236-006-11 2236-006-13	FA	4-3/8	Reg Curve Bellied
	2236-006-12	FA	4-3/8	Bellied	2236-006-11 2236-006-13	FA	4-3/8	Reg Curve Bellied
2248	2248-10-01	EP	3	Bellied	2248-100-02 2248-100-08	EP	3	Straight Bellied
	2248-10-09	FA	4-3/8	Straight	2248-100-10 2248-100-12	FA	4-3/8	Reg Curve Bellied
	2248-10-11	FA	4-3/8	Bellied	2248-100-10 2248-100-12	FA	4-3/8	Reg Curve Bellied
2436	2436-400-01 2436-400-05	EP	3	Reg Curve Full Bellied	2436-401-01	EP	3	Bellied
2540	901K	E	3	Straight	902K	E	3	Straight
	901KA	EP	3	Straight	902KA 902L	DS EP	3	Straight Bellied
	901KC	EP	3	Bellied	902KA 902L	DS EP	3	Straight Bellied
	901L	EP	3	Wedge	902KA 902L	DS EP	3	Straight Bellied
	2540-400-03	FA	5-3/8	Bellied	2540-400-04 2540-400-06	FA	5-3/8	Bellied Reg Curve
	2540-400-05	FA	5-3/8	Reg Curve	2540-400-04 2540-400-06	FA	5-3/8	Bellied Reg Curve
2540 H.D.	901HA	B	3	Bellied	902H	B	3	Bellied
	901KA	EP	3	Straight	902KA	DS		Straight
3042	3042-051-01	FA	6-3/8	Bellied	3042-051-02 3042-051-03	FA	6-3/8	Reg Curve Bellied
	3042-051-04	FA	6-3/8	Reg Curve	3042-051-02 3042-051-03	FA	6-3/8	Reg Curve Bellied
3054	3054-500-17	FA	6-3/8	Bellied	3054-500-18	FA	6-3/8	Bellied

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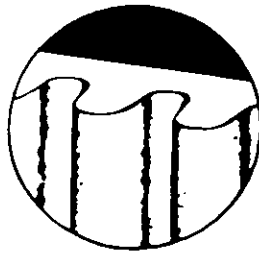
**Crusher Jaws - Welded Base
Standard & Special**

SINGLE OVERHEAD ROLLER BEARING CRUSHER								
WELDED BASE	STATIONARY				MOVABLE			
Model Number	Part Number	Style Tooth	Pitch (Inch)	Profile	Part Number	Style Tooth	Pitch (Inch)	Profile
3240	901KA	EP	3	Straight	3040A05 3040-600-01	DS EP	3	Straight Full Bellied
	901KC	EP	3	Bellied	3040A05 3040-600-01	DS EP	3	Straight Full Bellied
	901L	EP	3	Wedge	3040A05 3040-600-01	DS EP	3	Straight Full Bellied
	2540-400-03	FA	5-3/8	Bellied	3040A05 3040-600-01	DS FA	5-3/8	Straight Reg Curve
	2540-400-05	FA	5-3/8	Reg Curve	3040A05 2640-001-27 2640-001-26	DS FA FA	5-3/8	Straight Bellied Reg Curve
3242	3242L01	E	7	Straight	3242L02	DS		Straight
	3242L01F	EP	7	Straight	3242L02 3242L02D	DS EP	7	Straight Full Bellied
	3242-050-06	FA	6-3/8	Bellied	3242L02 3242-050-07 3242-050-05	DS FA FA	6-3/8 6-3/8	Straight Bellied Reg Curve
	3242-050-04	FA	6-3/8	Bellied	3242L02 3242-050-07 3242-050-05	DS FA FA	6-3/8 6-3/8	Straight Bellied Reg Curve
3648	3645-049-20	FA	6-3/8	Reg Curve	3645-049-21 3645-049-30	FA	6-3/8	Reg Curve Bellied
	3645-049-22	FA	6-3/8	Bellied	3645-049-21 3645-049-30	FA	6-3/8	Reg Curve Bellied
3660	3660-049-02 3660-049-03	FA	6	Bellied Reg Curve	3660-049-01	FA	6	Bellied
4242	3242L01 3242L01F	E EP	7	Straight	3242L02	DS		Straight
	3242-050-06	FA	6-3/8	Bellied	3242L02 3242-050-07 3242-050-05	DS FA FA	6-3/8 6-3/8	Straight Bellied Reg Curve
	3242-050-04	FA	6-3/8	Reg Curve	3242L02 3242-050-07 3242-050-05	DS FA FA	6-3/8 6-3/8	Straight Bellied Reg Curve
4248	4248B01D 4248-049-01 4248-049-03	Swage FA FA	6 6 6	Bellied Reg Curve Bellied	4248B02 4248B02 4248-049-02	DS DS FA	6	Bellied Bellied Reg Curve
5460 Requires 2-piece Jaw	5460-001-85 5460-001-93	FA	6	Straight Bellied	5460-001-86 5460-001-92	FA	6	Straight Bellied
5748	4248B01D 4248-049-01 4248-049-03	Swage FA FA	6 6 6	Bellied Reg Curve Bellied	4248B02 4248B02 4248-049-02	DS DS FA	6	Bellied Bellied Reg Curve

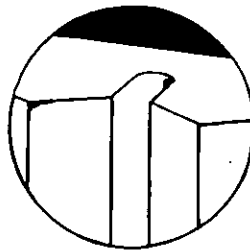
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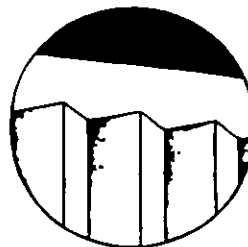
Crusher Jaws - Cast Base Standard & Special



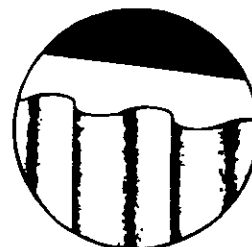
TYPE 'FA'
ROUND TOOTH
DEEP CORRUGATION



TYPE 'EP'
POINTED TOOTH



TYPE 'E'
POINTED TOOTH



TYPE 'F'
ROUND TOOTH



STRAIGHT
FACE



REGULAR
CURVE



BELLIED



FULL
BELLIED

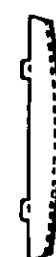
STATIONARY JAW



STRAIGHT
FACE



REGULAR
CURVE



BELLIED



FULL
BELLIED

MOVABLE JAW

SINGLE OVERHEAD ROLLER BEARING CRUSHER

CAST BASE	STATIONARY				MOVABLE			
	Part Number	Style Tooth	Pitch (Inch)	Profile	Part Number	Style Tooth	Pitch (Inch)	Profile
336	6		-Obsolete-		7		-Obsolete-	
336 Special	102	None		Full Bellied	103	None		Straight
1016	302	E	1-1/2	Straight	303B 305T	E	1-1/2	Reg Curve Full Bellied
1020	402A	E	1-1/2	Bellied	403 405	E	1-1/2 1-1/2	Reg Curve Full Bellied
1024	502	E	1-1/2	Bellied	503 505	E	1-1/2	Reg Curve Full Bellied
1036	602L	F	2	Bellied	603SS 605S	F F	2	Reg Curve Full Bellied
	602LH	F	2	Bellied	603SS 605S	F F	2	Reg Curve Full Bellied
	602UA	EP	3	Wedge	603UA 605VA	EP EP	3	Straight Full Bellied
	1036-049-01	FA	3-3/8	Bellied	1036-049-02 1036-049-03 1036-049-04	FA	3-3/8	Bellied Full Bellied Reg Curve
	1036-049-05	FA	3-3/8	Reg Curve	1036-049-02 1036-049-03 1036-049-04	FA	3-3/8	Bellied Full Bellied Reg Curve
	1036-049-06	FA	3-3/8	Full Bellied	1036-049-02 1036-049-03 1036-049-04	FA	3-3/8	Bellied Full Bellied Reg Curve

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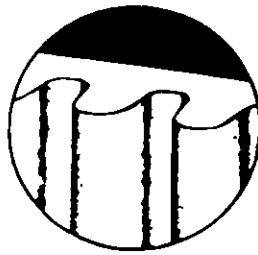
Crusher Jaws - Cast Base Standard & Special

SINGLE OVERHEAD ROLLER BEARING CRUSHER								
CAST BASE	STATIONARY				MOVABLE			
Model Number	Part Number	Style Tooth	Pitch (Inch)	Profile	Part Number	Style Tooth	Pitch (Inch)	Profile
1524	702	E	2	Straight	703 705A	E	2	Reg Curve Obsolete
1524 Special	702L	F	2	Straight	703L 705A01	F E	2	Reg Curve Full Bellied
	9001-344	EP	3	Bellied	9001-345	EP	3	Reg Curve
1536	802X	E	2	Straight	803X 803Y	E	2	Reg Curve
1536 Special	802Y	F	2	Straight	803XY	F	2	Reg Curve
1836	802X	E	2	Straight	803X	E	2	Reg Curve
1836 Special	802Y	F	2	Straight	803XY 803Y	F	2	Reg Curve

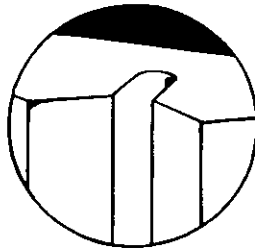
Cedarapids

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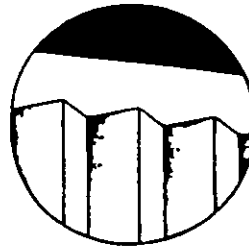
Crusher Jaws - Twin/Dual/Gyra Standard & Special



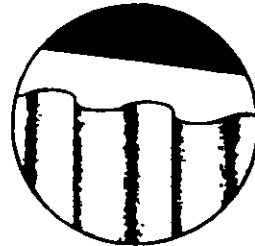
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ROUND TOOTH
DEEP CORRUGATION



TYPE 'EP'
POINTED TOOTH



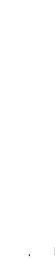
TYPE 'E'
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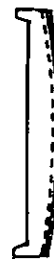
TYPE 'F'
ROUND TOOTH



STRAIGHT
FACE



REGULAR
CURVE



BELLIED



FULL
BELLIED

STATIONARY JAW



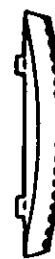
STRAIGHT
FACE



REGULAR
CURVE



BELLIED



FULL
BELLIED

MOVABLE JAW

TWIN JAW ROLLER BEARING CRUSHER

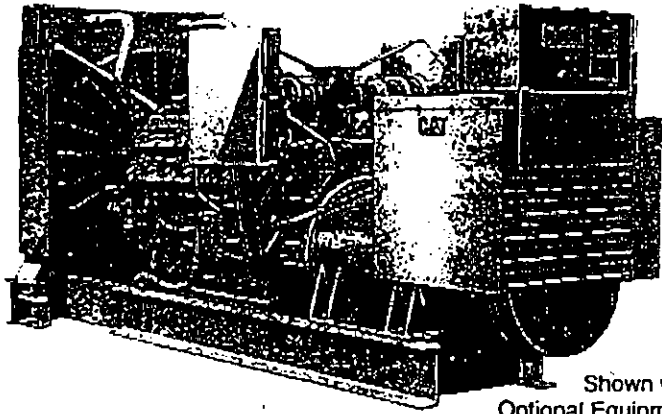
Model Number	STATIONARY				MOVABLE			
	Part Number	Style Tooth	Pitch (Inch)	Profile	Part Number	Style Tooth	Pitch (Inch)	Profile
1216					303U	F	2	Bellied
1236					1604A07 1640A07-02	EP	3	Reg Curve Wedge
1624					703T	F		Bellied
1836					1602A06	E	3	Reg Curve
					1602A06C	EP	3	Reg Curve
					1602-001-05	FA	3-3/8	Full Bellied
					1602-001-04	FA	3-3/8	Bellied
				1602-001-03	FA	3-3/8	Reg Curve	

DUAL JAW ROLLER BEARING CRUSHER

1640 640	1700-12A	E	3	Reg Curve	1700-13A	E	3	Bellied
1830 630	1702A07A	EP	3	Reg Curve	1702A08A	EP	3	Bellied

GYRA DUAL JAW ROLLER BEARING CRUSHER

1036	1604A07	EP	3	Reg Curve	1606-002-01 1606-002-04	EP	3	Bellied Full Bellied
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Shown with Optional Equipment

Generator Set

3512
3412

60 Hz

910KW

Prime Power – 545 kW
Standby Power – 600 kW

SPECIFICATIONS

Watercooled Diesel, four stroke, V-12
 Bore—mm (in) 137 (5.4)
 Stroke—mm (in)..... 152 (6.0)
 Displacement—L (cu in) 27.0 (1,649)
 Aspiration..... Turbocharged-Aftercooled
 Compression ratio..... 14.5:1



FEATURES

DATA TO BE OBTAINED FROM SERIALS
 The generator set is designed to meet the requirements of the IEEE 1547-2003 standard for interconnecting distributed energy resources with the electric power system. The generator set is designed to meet the requirements of the IEEE 1547-2003 standard for interconnecting distributed energy resources with the electric power system. The generator set is designed to meet the requirements of the IEEE 1547-2003 standard for interconnecting distributed energy resources with the electric power system.

EXHAUSTIVE TESTS PERFORMED ON DIESEL
 The generator set is designed to meet the requirements of the IEEE 1547-2003 standard for interconnecting distributed energy resources with the electric power system. The generator set is designed to meet the requirements of the IEEE 1547-2003 standard for interconnecting distributed energy resources with the electric power system. The generator set is designed to meet the requirements of the IEEE 1547-2003 standard for interconnecting distributed energy resources with the electric power system.

CONTROL PANEL (OPTIONAL EQUIPMENT)
 The generator set is designed to meet the requirements of the IEEE 1547-2003 standard for interconnecting distributed energy resources with the electric power system. The generator set is designed to meet the requirements of the IEEE 1547-2003 standard for interconnecting distributed energy resources with the electric power system. The generator set is designed to meet the requirements of the IEEE 1547-2003 standard for interconnecting distributed energy resources with the electric power system.

PROTECTION (CATERPILLAR)
 The generator set is designed to meet the requirements of the IEEE 1547-2003 standard for interconnecting distributed energy resources with the electric power system. The generator set is designed to meet the requirements of the IEEE 1547-2003 standard for interconnecting distributed energy resources with the electric power system. The generator set is designed to meet the requirements of the IEEE 1547-2003 standard for interconnecting distributed energy resources with the electric power system.

CATERPILLAR SR4 GENERATOR

Frame size 589
 Type Static regulated brushless excited
 Construction Single bearing, close coupled
 Three phase wye connected
 Insulation Class F with tropicalization
 Terminal box Drip proof IP 22
 Overspeed capability 150%
 Paralleling capability Standard with adjustable
 voltage droop
 Voltage regulator 3 phase sensing with
 Volts-per-Hertz
 Adjustable – 25% + 10%
 Voltage regulation ... Less than ± 1/2% (steady state)
 Less than ± 1% (no load to full load)
 Voltage gain Adjustable to compensate for engine
 speed drop and line loss

Wave form Less than 5% deviation
 TIF Less than 50
 THD Less than 5%

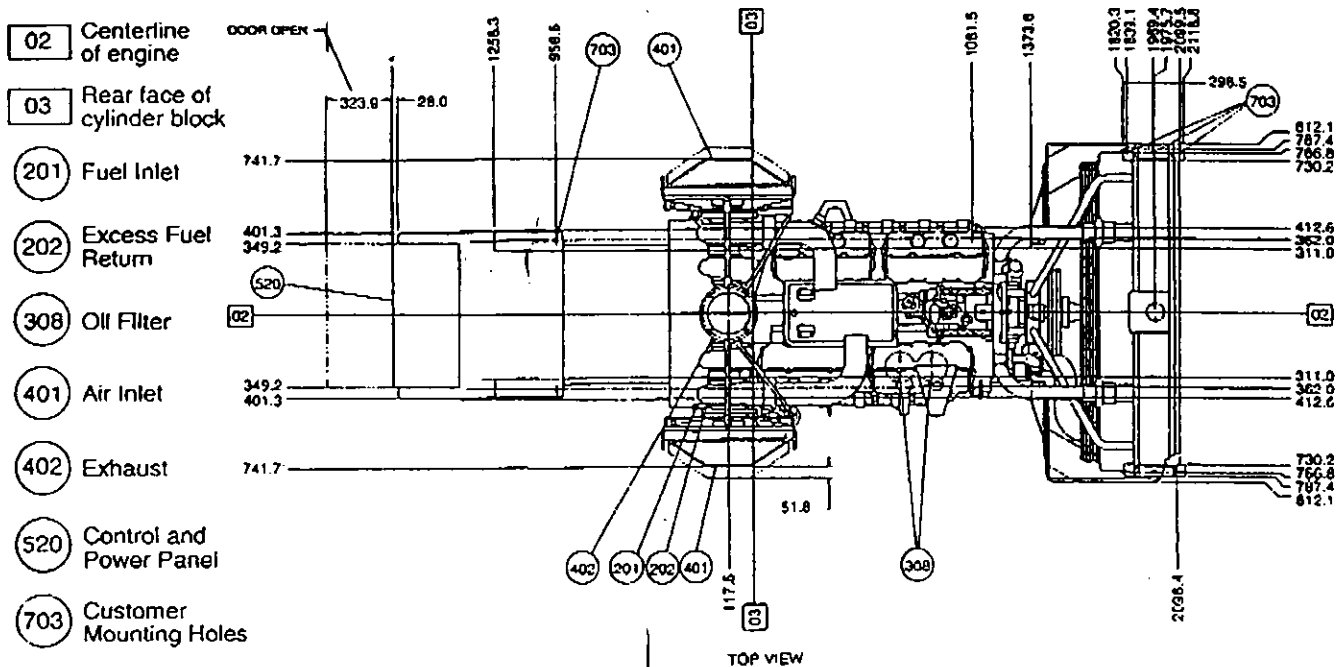
CATERPILLAR CONTROL PANEL

24 Volt DC Control
 Terminal box mounted
 Vibration isolated
 NEMA 1, IP 22 enclosure
 Electrically dead front
 Lockable door
 Generator instruments meet ANSI C-39-1

Voltages Available
 (Consult Price List)

3512 910KW

GENERATOR SET



TECHNICAL DATA

		Metric		English		
		Prime Standby		Prime Standby		
Rating Information	Rating type					
	Power rating @ 0.8 PF with fan	kW	545 600	kW	545 600	
	Power rating @ 0.8 PF with fan	kV•A	681 750	kV•A	681 750	
Dimensions	Generator frame size		589 589		589 589	
	Length	mm	3874 3874	in	152.5 152.5	
	Width	mm	1624 1624	in	63.9 63.9	
	Height	mm	2154 2154	in	84.8 84.8	
	Weight (dry)	kg	4875 4875	lb	10,000 10,000	
Lubrication & Cooling Systems	Engine lubricating oil capacity	L	117 117	qts	124 124	
	Engine coolant capacity w/o radiator	L	58.6 58.6	gal	15.5 15.5	
	Engine coolant capacity with radiator	L	128.6 128.6	gal	34.0 34.0	
	Standard radiator arrangement data:					
	Air flow (max. @ rated speed)	m ³ /min	1070 1070	cfm	37,787 37,787	
	Air flow restriction (after radiator)	kPa	.06 .06	in water	0.25 0.25	
	Ambient air temperature (consult T.I.F.)	deg C	52 53	deg F	125 125	
Coolant pump external resistance (max. allowable)	m water	5.1 5.1	ft water	16.8 16.8		
Coolant pump flow @ max. allowable resistance	L/min	530.6 530.6	gpm	140 140		
Exhaust System	System backpressure (max. allowable)	kPa	6.7 6.7	in water	27 27	
	Exhaust flange size (internal dia.)	mm	200.2 200.2	in	8 8	
Performance Data @ Rated Conditions	Fuel consumption (100% load) with fan	L/hr	152.8 170.1	gph	40.4 44.9	
	Fuel consumption (75% load) with fan	L/hr	114.5 127.0	gph	30.2 33.5	
	Combustion air inlet flow rate	m ³ /min	51 56	cfm	1815 1981	
	Exhaust gas flow rate	m ³ /min	134 149	cfm	4736 5265	
	Heat rejection to coolant (total)	kW	350 382	Btu/min	19,896 21,742	
	Heat rejection to exhaust (total)	kW	519 578	Btu/min	29,515 32,870	
	Heat rejection to atmosphere from engine	kW	149 175	Btu/min	8473 9952	
	Heat rejection to atmosphere from generator	kW	36 41	Btu/min	2039 2308	
	Exhaust gas stack temperature	deg C	503 517	deg F	937 963	

CATERPILLAR**3412 GENERATOR SET****STANDARD EQUIPMENT****Engine**

Aftercooler
 Air cleaner with service indicator
 Base, structural steel
 Breather, crankcase
 Cooler, lubricating oil
 Exhaust fitting and flange
 Filters, right hand
 Fuel, full flow
 Governor
 Lifting eyes
 Lubricating oil, gear driven
 Manifold, exhaust, dry
 Pumps,
 fuel transfer, gear driven
 lubricating oil, gear driven
 jacket water, gear driven
 Radiator
 Shutoff, manual
 Starting, electric, 24 Volt DC

Generator

SR4 brushless with VR3
 Automatic voltage regulator

Control Panel

Auto start-stop control module
 w/cycle crank and cooldown
 Digital ammeter, voltmeter,
 phase selector switch,
 frequency meter
 Digital DC voltmeter, tachometer,
 hourmeter
 Digital oil pressure and water
 Emergency stop push button
 Engine control switch for auto,
 start/run, off/reset, stop
 Lamp display
 temperature gauges
 Shutoffs with indicators for:
 low oil pressure
 high water temperature
 overspeed
 overcrank
 emergency stop push button
 System diagnostic codes
 digital readout
 Voltage adjust rheostat

OPTIONAL EQUIPMENT**Engine/Base**

Air cleaner, heavy duty
 Air precleaner
 Battery chargers
 Battery/racks
 Charging alternator
 Cooling system
 high ambient radiators
 fan drives
 heat exchangers
 Exhaust system
 fittings, elbows, pipe
 flex, mufflers
 Governor, Woodward
 Jacket water heaters
 Primary fuel filter
 Protection devices
 Tachometer drive
 Vibration isolators

Generator

Manual voltage control
 MIL Std. 461B, Part 9
 Permanent magnet excitation
 RFI N Level (VDE 875), BS800
 Space heater

Switchgear

Circuit breaker
 manual
 electric operated
 Enclosure — Floor standing NEMA 1
 Main load buss
 Paralleling
 manual
 permissive
 auto (consult factory)
 Protective relays

Control Panel

Auxillary relay
 Enclosure, NEMA 12/IP 44
 Governor speed switch
 Illuminating lights
 Installed speed sensing
 governor (Woodward)
 Provision for:
 alarm module
 alarm module — NFPA 99
 alarm module — NFPA 110
 Reverse power relay
 Starting aid switch
 Synchronizing lights