

Pavement Preservation Best Practices

Mike Bryant, South Central U.S.
Territory Sales Manager

Crafco Is The World's Largest Producer Of Crack Sealing Material & Equipment



Crack Sealing

At CrafcO, we are passionate about crack sealing.

We believe crack sealing should be the foundation of every pavement preservation program.

Crack sealing is one of the most elementary, cost effective pavement maintenance practices.



un-der-mine

Verb

1. erode the base or foundation (of a rock formation)
synonyms erode, wear away, eat away at
1. damage or weaken (someone or something)
especially gradually or insidiously
Synonyms subvert, undercut, sabotage, threaten, weaken, compromise, diminish, reduce, impair, mar, spoil, ruin, damage, hurt, injure, cripple, sap, shake



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The Washington Post

12/11/13

Beneath the surface, the Beltway crumbles



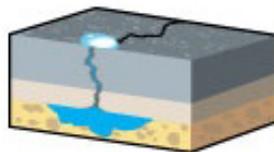
Mark Gail/The Washington Post - Traffic is seen on the Capital Beltway in this file photo. Officials say 62 percent of roads in the Washington region need significant repair or replacement.

By Ashley Halsey III, Published: March 30, 2013 [E-mail the writer](#) ↩

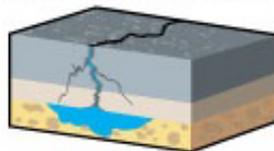
How a highway falls apart

When a 50-year-old highway such as the Capital Beltway begins to show its age, the problems are more than pavement-deep. A February report found that traveling on bad roads costs the average D.C. area driver about \$2,200 a year in wasted fuel and vehicle wear and tear. [Read related article.](#)

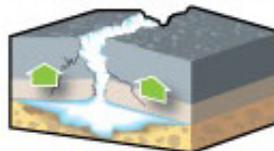
Soon after the ribbon is cut on a new highway, weather and constant traffic – especially large, heavy trucks – begin to cause surface cracks.



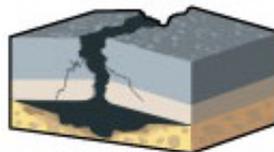
1. If left untreated, the cracks get deeper and completely break through the asphalt, letting water seep into the rock and soil beneath it.



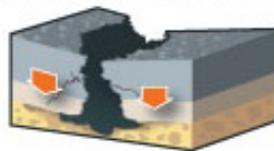
2. Eventually this underlying layer softens, making it less able to support the pavement. Additional cracks occur more easily.



3. In winter, the water below the asphalt freezes and expands, buckling the road.

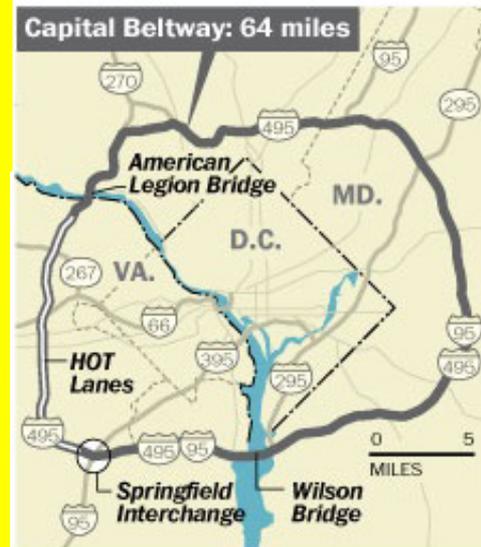


4. When it thaws, it leaves a gap that, when broken through by a tire, becomes a pothole.



5. Patches and repaving temporarily smooth the surface, but the underlying problem remains.

Asphalt
Base



un-der-mine

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We are passionate about crack sealing

Crack sealing should be the foundation for every pavement preservation program

Crack sealing is one of the most elementary, cost effective pavement maintenance practices





MODOT



Summary

Crack Sealing is the most important pavement maintenance process because it keeps water from entering the pavement's substructure where pavement failure begins.

- ▶ If you can't do any other form of maintenance - you must crack seal.
- ▶ All other surface treatment performances including chip seals, depend on how well the pavement's cracks have been sealed.

Keeping in mind that MoDOT will provide the best value for every dollar spent, the Maintenance Division will use best practices to stretch our dollars by keeping our roads in good condition for as long as possible. We will perform high quality work to provide a smooth and safe driving experience.

Crack sealing is an integral component of a sound preservation program to extend the useful life of asphalt pavements. Asphalt pavements should be inspected yearly and crack sealing is coupled with periodic applications of a quality surface preservation treatment, a strategic and cost effective step has been taken and MoDOT's tangle results have been attained while providing a looks good/rides good pavement for Missouri citizens.

page 24

Miss

18

Bus. (573)

Participant's Ma

October 2008

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spent, the Maintenance Division will use

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possible. We will perform

and safe driving



BEST PRACTICES

Liberal, Kansas

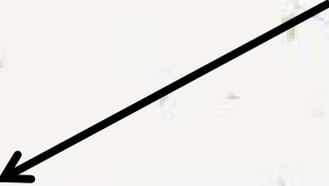




Satellite
Davenport
Traffic

United States

**LIBERAL, KS
POPULATION 20,218**



City of Liberal

The City of Liberal has embraced the concept of pavement preservation.



City of Liberal

Liberal has had a dedicated pavement maintenance plan in place since 1997.





Liberal Public Works Department

Interview with Public Works Director, Joe Sealy, in Dec 2013 to obtain a better understanding of Liberal's pavement maintenance procedures.



Liberal Public Works Department



Joe has over 20
years experience as
Liberal's Director of
Public Works



Liberal Public Works Department

Responsible for:

- Road & bridge maintenance
- Water systems & waste water
- Sewer & sanitation
- Golf course maintenance
- Engineering & new construction
- Total annual operating budget \$12M



Details of Liberal's Pavement Preservation Program

- 25% of the city's streets are treated every year
- Streets are crack sealed in Spring followed by chip seal in the Fall
- 80% of work is done by contractors, work sent out for bid annually
- 20% of work done in-house
- Cost of the program is \$450,000 annually or 4.8% of the total P.W. operating budget

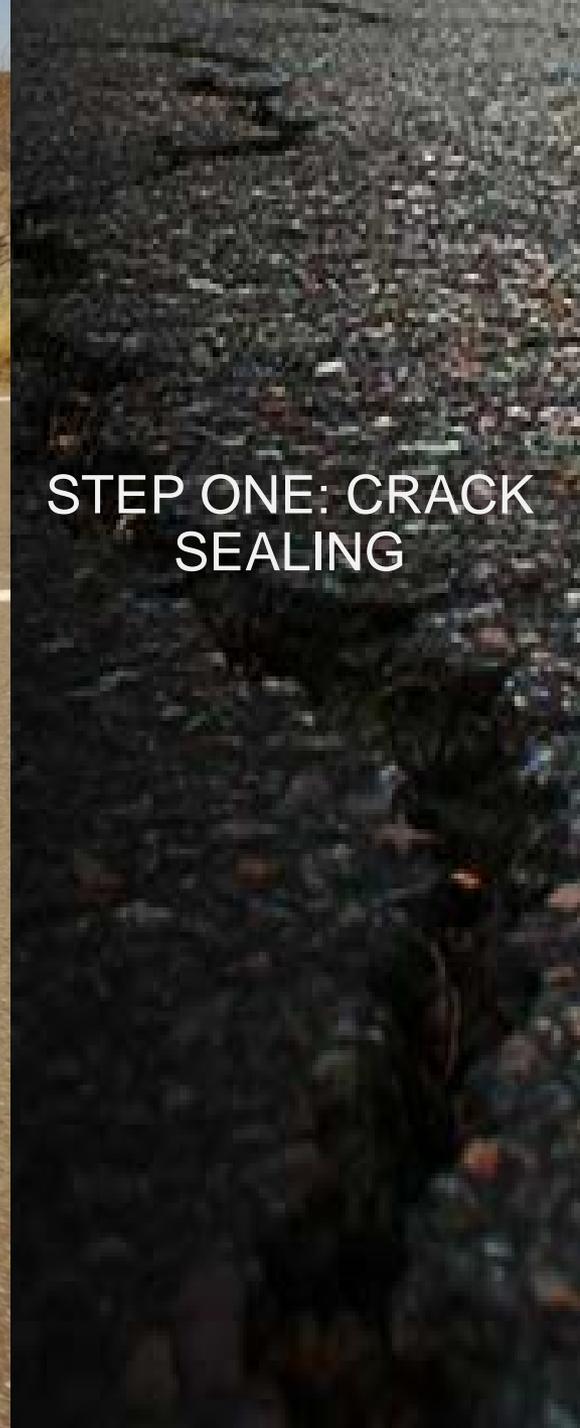


**25 % OF LIBERAL'S STREETS
AND ROADS ARE CRACK SEALED
AND CHIP SEALED EVERY YEAR.**





STEP ONE: CRACK
SEALING





STEP TWO:
CHIP SEAL



New Mexico Department of Transportation



New Mexico consistently ranks in the TOP 5 nationally for overall highway performance*

* Reason Foundation's 20th annual report on the performance of state highway systems.



NMDOT Notables

- New Mexico has crack sealed their road system for over 30 years.
- New Mexico has routed cracks prior to crack sealing for over 30 years based on manufacturer's recommendations.
- Contractors are paid by the lane mile and lb. quantities within the lane mile.



Steve Dismukes Testimony

Steve Dismukes is the owner of Pavement Sealants & Supply in Albuquerque New Mexico. Steve has worked within the pavement preservation industry for over 30 years.

Quotes From Steve:

“Engineers would never lay concrete down without installing an expansion joint. It’s the same concept as with routing and sealing cracks.. Any opening must be sealed to prevent deterioration to the base layer.”

Regarding routing, “I consider crack sealing the same concept as sealing a window in your home with silicone. You want to work the material down into the joint. Routing allows you to more easily work the crack seal material down inside the joint.”



New Mexico DOT Rout and Seal How and Why



Routed & Sealed Cracks Perform Better Than Untreated Cracks

- Untreated crack
 - No protection



SPRING/FALL



WINTER



SUMMER

Unsealed cracks grow larger because of the intrusion of water and debris entering and then the compressive forces on the debris during the summer months.

- Non-routed, Sealed Crack
 - From 1 to less than 4 years of protection



SPRING/FALL



WINTER



SUMMER

Simple crack filling exposes the sealant to traffic wear during the warm summer, the reduced amount of sealant results in cohesion failure during the winter season.

- Routed, Sealed Crack
 - Up to 7+ years of protection



SPRING/FALL



WINTER



SUMMER

A routed crack reservoir allows for seasonal expansion and contraction of the pavement movement protecting the integrity of the sealant.



Untreated Crack





Rout the crack keeping the cutter centered over the crack



Routed Crack with Clean Sidewalls

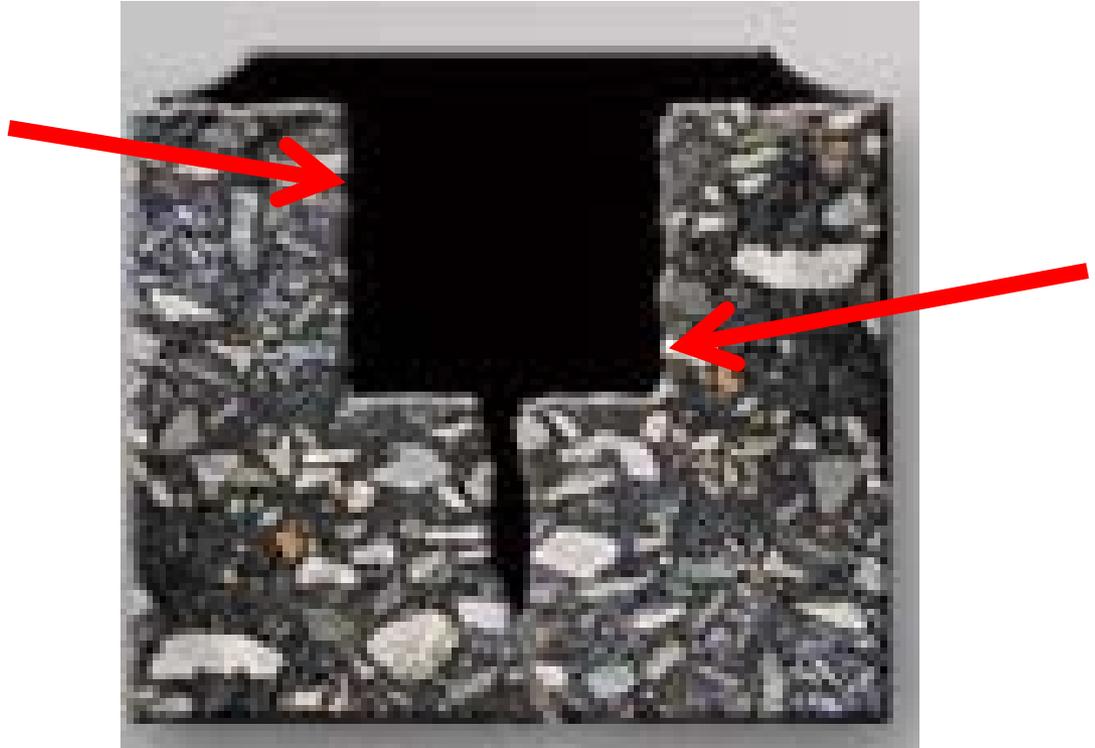


Reservoir



Routing
creates a
reservoir
that holds
the sealant

Adhesion to the Sidewalls



Reservoir Accommodates Movement



AS THE CRACK MOVES, THE MATERIAL BONDS TO THE EDGES AND MOVES AS WELL



Overland Park, KS



OVERLAND PARK
K A N S A S

ABOVE AND BEYOND. BY DESIGN.

**OVERLAND PARK, KS
POPULATION 175,000**



Overland Park Overview

- The City Maintains Approx. 2000 Road Lane Miles
- 80%+ Are Asphalt
- Annual Street Maintenance Budget \$12M
- New Roads Are Crack Sealed Year 3 Followed by Chip Seals During Later Years



Newer Roads Are Given Priority For Maintenance

Jeff Hunt Testimony

I interviewed Overland Park City Street Maintenance Manager Jeff Hunt in March of 2014. Jeff has over 20 years experience in street maintenance with Overland Park.

QUOTES:

- “I want to spend my money on the good streets.”
- “Our experience tells us it is much less expensive to keep a good street in good condition”
- “Crack sealing is the most important thing that we do”
- “Crack sealing prevents base failure.”

Overland Park

- The City of Overland Park uses dedicated software to manage maintenance, budgets, and map the city streets by color coding
- Every year, summer interns from the University of Kansas Engineering Department walk a percentage of the 2000 lane miles and assign a PCI, (Pavement Condition Index) to every mile
- The PCI is from 1-100, 1 being the worst
- Within the software, you can click on a lane mile and pull up its entire maintenance history as well as its future maintenance schedule
- ARCMAP is the software program



2014-2016 Maintenance Program Draft Candidate Map with 2013 PCIs August 22, 2013

Legend

Crack Seal

2014 Plan

Chip Seal Planned

Chip Seal (RC)

Microsurface

Overlay

UBAS

2015 Plan

Chip Seal Planned

Chip Seal (RC)

Microsurface

Overlay

UBAS

2016 Plan

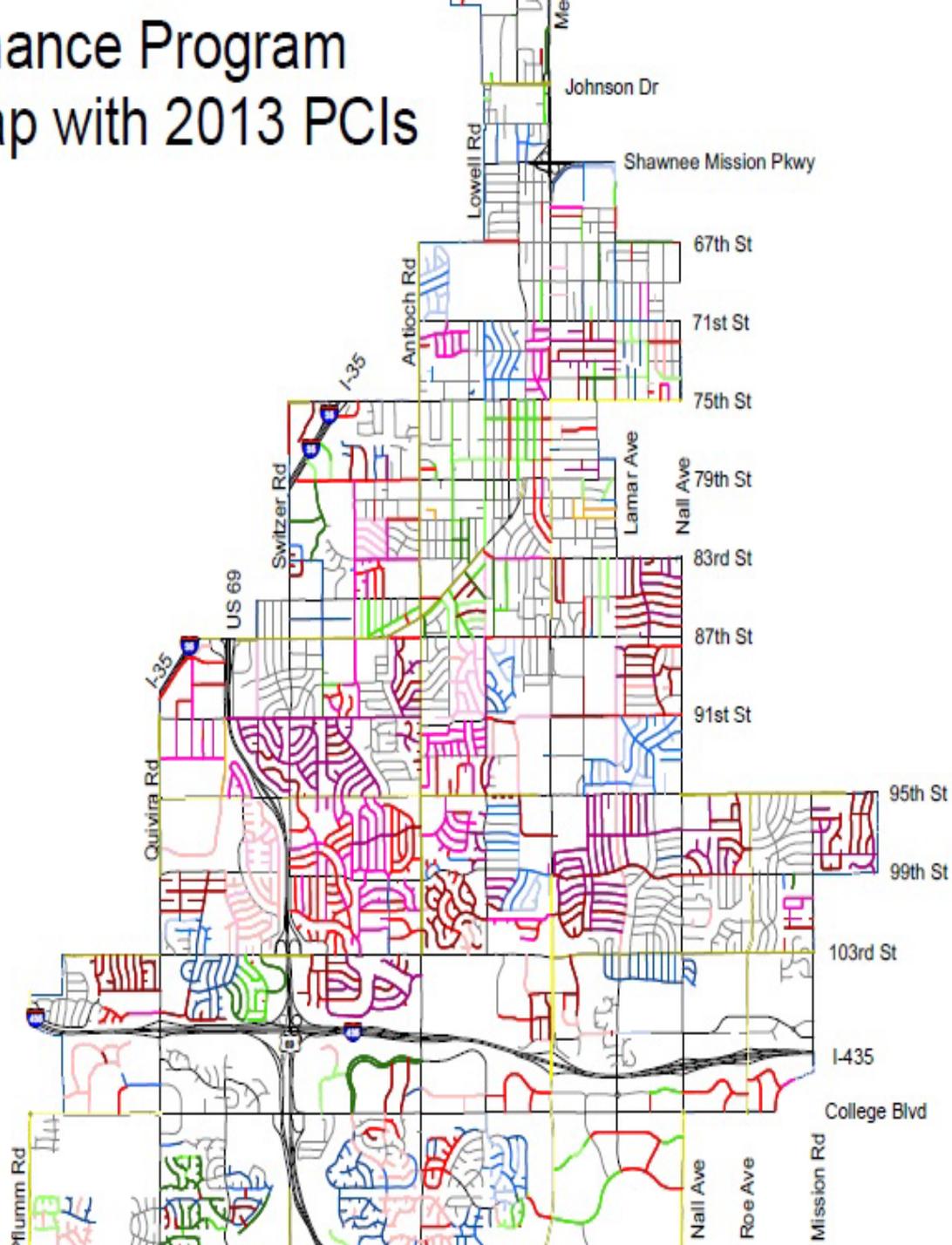
Chip Seal Planned

Chip Seal (RC)

Microsurface

Overlay

UBAS



Centerville, MO





CENTERVILLE, MO

MISSOURI HISTORIC TOWNS



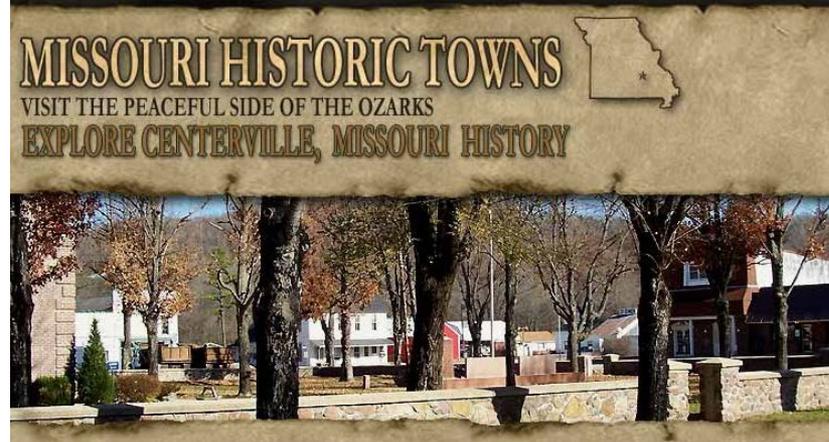
VISIT THE PEACEFUL SIDE OF THE OZARKS
EXPLORE CENTERVILLE, MISSOURI HISTORY



Centerville

Centerville population: 1875

City Street Department services 19.5 total road miles



Centerville

Interview with Public Works Director Mike Smith in January 2014 to obtain a better understanding of Centerville's plans for road improvements



Centerville's Objectives

Centerville's Objectives for their 19.5 Total Lane Miles:

1. \$800,000 5 year bond for road improvements in 2012
2. Bond will be financed by a property tax increase
3. Rebuild 4.5 miles asphalt roads
4. Overlay 5 miles of roads with 4" asphalt
5. Begin a scheduled maintenance program (crack sealing, chip seal, etc.)



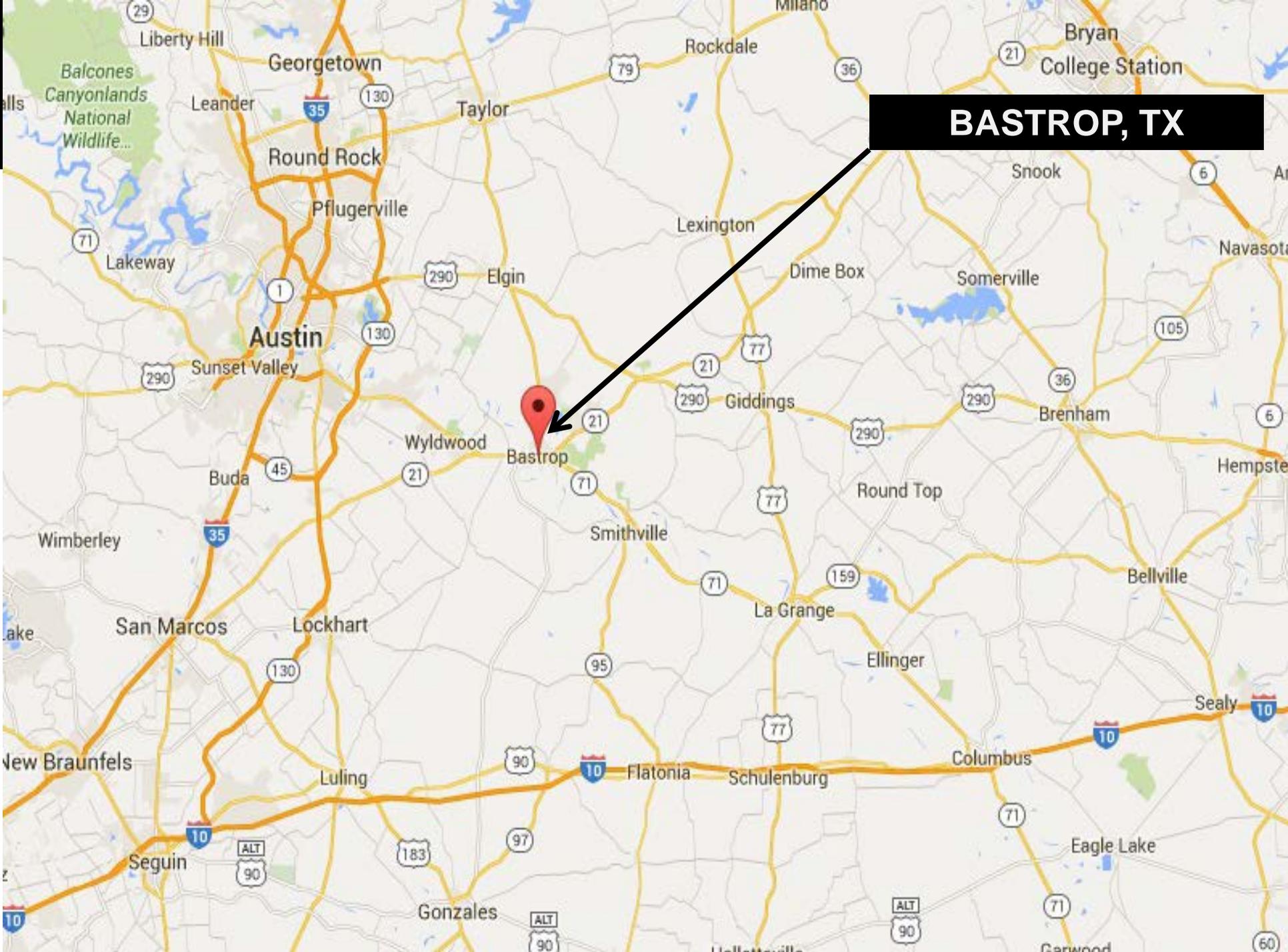
What Happened?

- 4.5 road miles have been rebuilt
- 3-4" overlays done for 5 miles
- Purchased a Crafcro SuperShot 125 crack seal melter in 2013



Texas Department of Transportation





BASTROP, TX

TXDOT

Roy Dill, TXDOT Area Engineer
Bastrop, TX Area Office

Interview with Roy in April 2015 to obtain a better understanding of the TXDOT crack seal program

Roy has over 22 years experience in pavement preservation working for the Texas Department of Transportation.

Crack Sealing/Surface Treatment Methodology

- Yearly visual analysis
- Crack seal projects are sent out to contractor bid
- TXDOT pays by the lane mile
- Winter crack seal treatments are followed by summer surface treatments, (seal coat, chip seal, etc.)



Liberal, Kansas



Quote

“Crack sealing keeps moisture out of the sub grade and base grade. The more we can keep that from happening, the longer our roads will last.”



Iberville Parish Louisiana



Iberville Parish

Iberville Parish taxpayers passed a multi-million dollar bond program in 2005 to overlay 90% of roads

Interview with Ryan Casto, Contractor with Material Resources in Baton rouge, LA in August 2015

Material Resources has serviced roads in Iberville Parish since 2009



Ryan Castro Testimony

Notes:

- 900 lane miles within the Parrish
- Annual crack sealing and surface treatments initiated in 2009
- Roads are sight evaluated annually, work is outsourced through contractors
- Results of 2015 sight evaluation – roads are considered by the Parrish to be in excellent condition
- 5 potholes out of 900 lane miles

Quotes:

- “Crack sealing preserved the road sufficiently to do surface treatments.”
- “Every pothole starts with a crack.”
- “Crack sealing is the most cost efficient practice in maintaining roadways.”
- “It is important to catch cracks early.”

Best Practices Overview

- All of the Above Agencies Have A Consistent Plan
- Yearly Analysis
- Timing is Important
- Newer Roads Should Be a High Priority For Treatments
- Crack Seal Followed By Surface Treatment
- Results



The background of the image is a dark, textured surface, likely asphalt, with a prominent crack running diagonally from the top right towards the bottom right. The crack is filled with a dark, possibly black, material, which could be a sealant or a shadow from the crack itself. The overall lighting is dim, creating a moody and industrial atmosphere.

**CRACK SEALING TECHNOLOGY
HAS ADVANCED RAPIDLY**

Tried & True Method: 2 Man Shoot & Squeeze





Many agencies are using a swivel disc applicator for a 1 man operation





1 person
operation,
cleaner
seal – less
material
used

EQUIPMENT HAS ADVANCED AS
WELL

Super Shot 125 Melter/Applicator



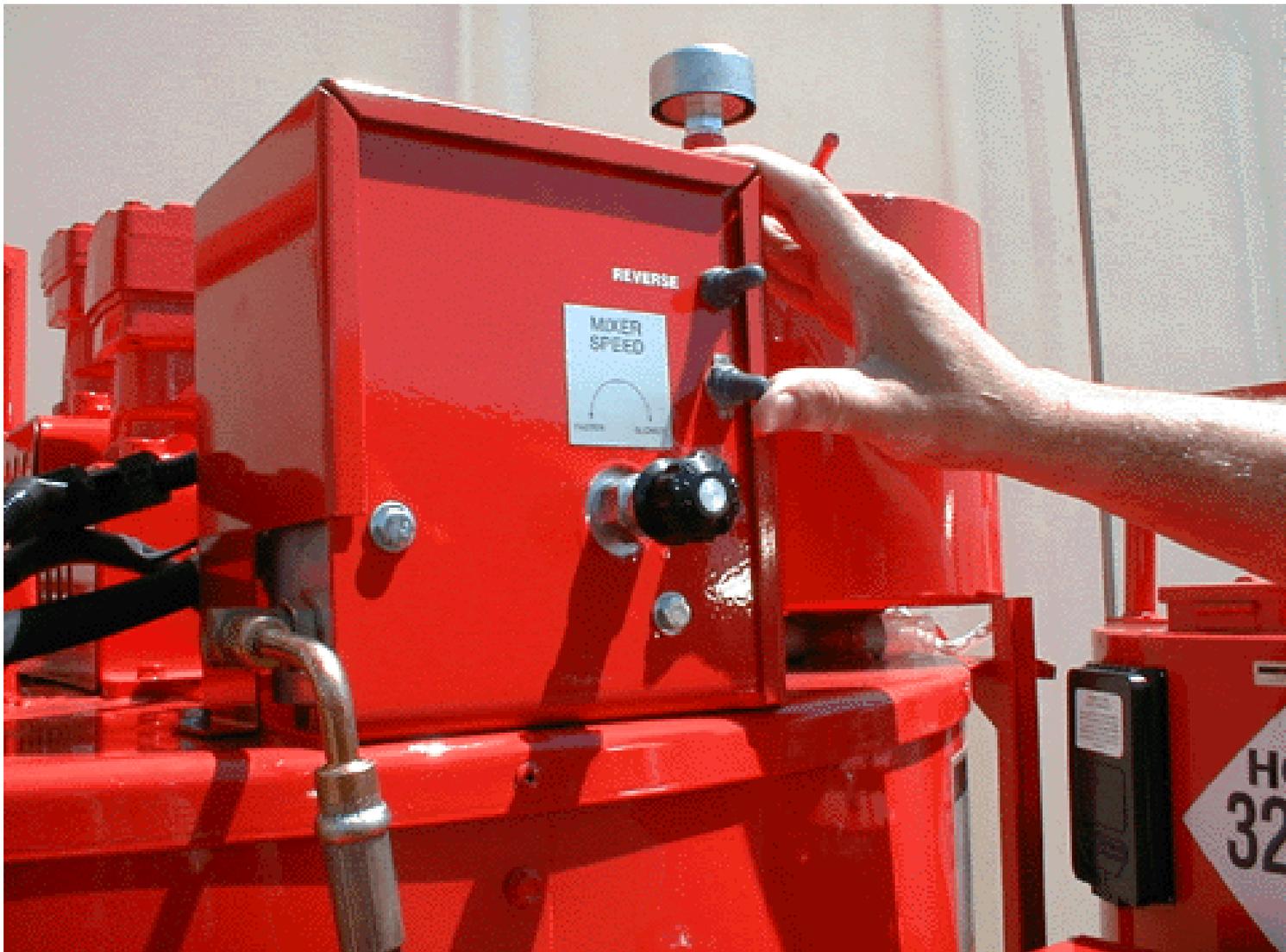
Ease Of Operation



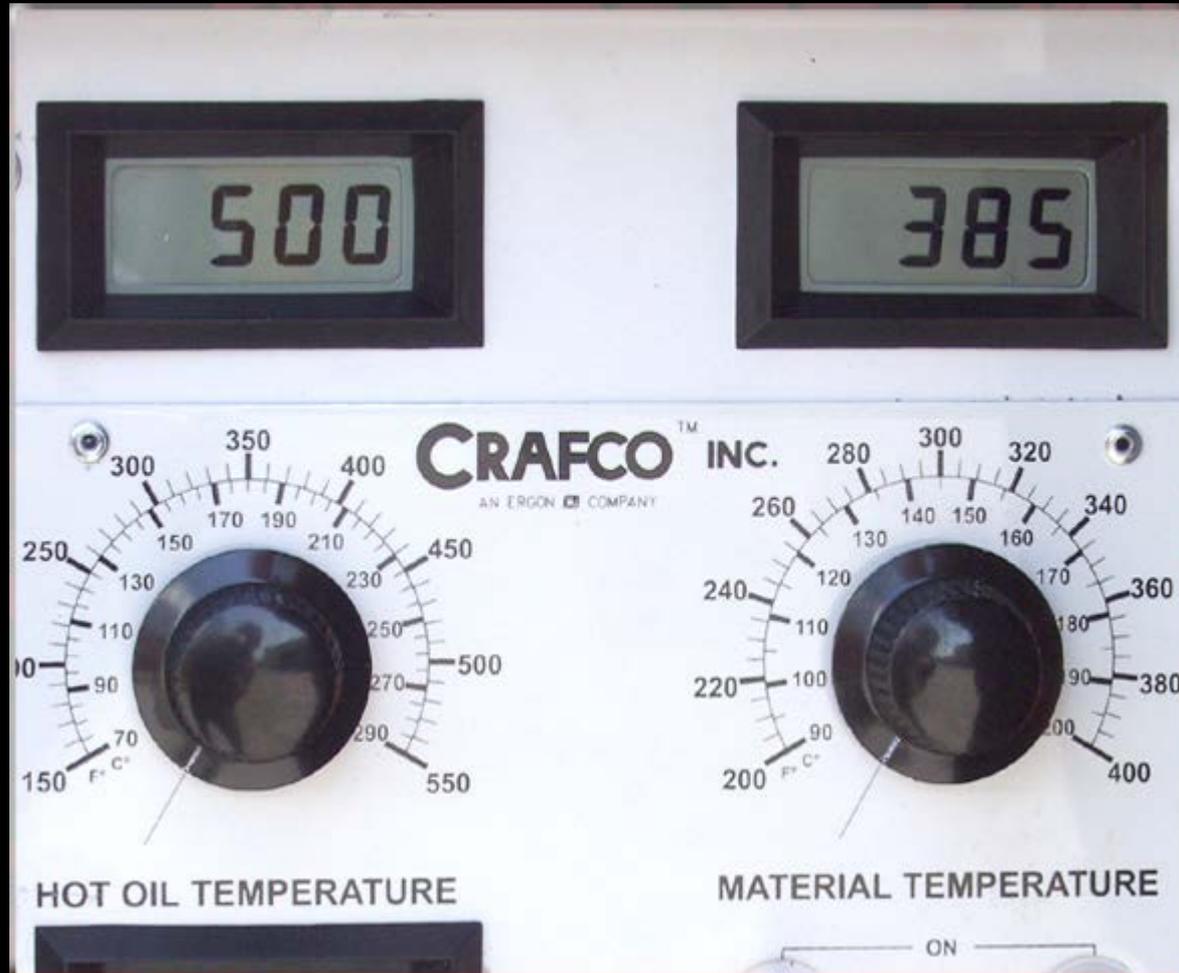
No Valves or
Complicated
Operating
Instructions.

Sealant Flow is
Controlled
by Pulling the
Trigger.

Just Pull The Trigger
and Go.



Quick and simple start up with the flip of a toggle switch



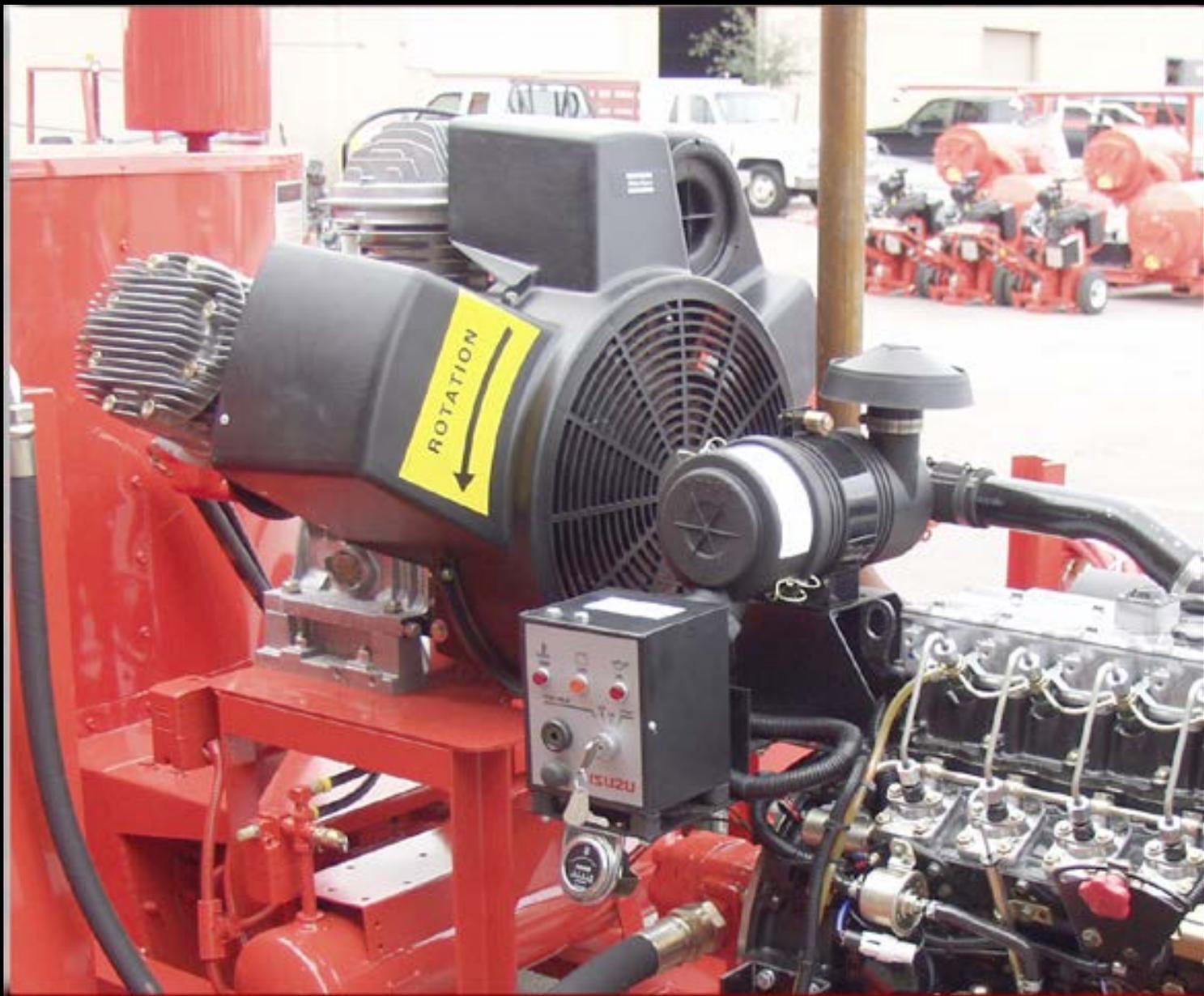
Digitally Controlled



Safe Operation, Anti-splash lid



Thermostatically controlled, no clogged hoses



Compressor: cleans out dirt and debris from cracks
increasing crack sealing efficiency

WE WOULD LIKE TO HEAR ABOUT YOUR BEST PRACTICES IN PAVEMENT PRESERVATION

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QUESTIONS?

Thank you



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