



FIX-N-FAX

Equipment Standard

(No. 134 October 2011)

Number 43

Mandatory Compliance

March 5, 2009

Fire Dozer Engine Air Filter Precleaner/ember screen

Fire dozer engine air intake systems are vulnerable to high heat and burning embers associated with wildland fire suppression. Original Equipment Manufacturer (OEM) pre-cleaners melt under high heat exposure and do not provide burning ember protection as recommended by the National Fire Protection Association (NFPA).

Inadequate ember protection can allow burning embers to enter the air filter housing and ignite the air filter causing the engine to stall out. Loss of engine power can put the equipment operator in extreme danger.

CAL FIRE worked with DRM Diversafab, (formerly BEST-EX, INC.) manufacturer of the "Centri™" precleaner, to develop a high heat resistant precleaner and ember prescreen that would meet the engine OEM air intake requirements, meet the NFPA and CAL FIRE [Fix-N-Fax #42](#) requirement of preventing burning embers larger than 0.039 inch from reaching the air filter.

DRM Diversafab was successful in their development of a "High Heat" model precleaner and a "High Heat" model prescreen to prevent any chance of a burning ember larger than .036 inch from reaching the paper air filter to comply with NFPA. The maximum temperature tolerance of the precleaner is 1,200 degrees Fahrenheit. The grease in the bearings is only good to approximately 350 degrees Fahrenheit for short duration but bearing failure will not compromise ember protection during a burn over. The prescreen made with the Kevlar® thread (locking stitching) is 900 degrees Fahrenheit. The Silicone coating (gray color) on the fabric is 500 degrees Fahrenheit and the Fiberglass base fabric is 1,000 degrees Fahrenheit.

In 2008, CAL FIRE was able to secure Federal Grant Funds (CFAA/SFA) to equip each CAL FIRE bull dozer with a high heat resistant precleaner and ember prescreen. In February of 2009 all CAL FIRE dozers were provided with pre-cleaner kits appropriate for the make/model dozer and was required to have the provided pre-cleaner installed on by April 15, 2009.

The following precleaner and ember prescreen shall be installed and maintained in good working order:

Manufacturer:

DRM Diversafab
820 Industrial Court
Baraboo, WI 53913 Ph: 608.356.4882
Fax: 608.3536.4883
www.centriprecleaner.com
Email: centriinfo@drmdiversfab.com

System components for: “Caterpillar” D6C (76a), D5H, D4H

- 1- EX-50 HH Precleaner**
- 1- 48-5040S HH Prescreen**
- 1- 37-5040 Adaptor**
- 1- 5 inch clamp**
- 1- 4 inch clamp**

System components for: “Caterpillar” D6C (10k), D6D, D6H, D6M, D6N, “John Deere” 750B

- 1- EX50 HH Precleaner**
- 1- 48-5050S HH Prescreen**
- 1- 24-50012 Straight Stack Extension, 5 inch (may be cut to appropriate length)**
- 2- 5 inch clamps**

System components for: “John Deere” 850B

- 1- EX-50 HH Precleaner**
- 1- 48-5040 HH Prescreen**
- 1- 37-5045 Adaptor**
- 1- 5 inch clamp**
- 1- 4.5 inch clamp**

HOW IT WORKS:

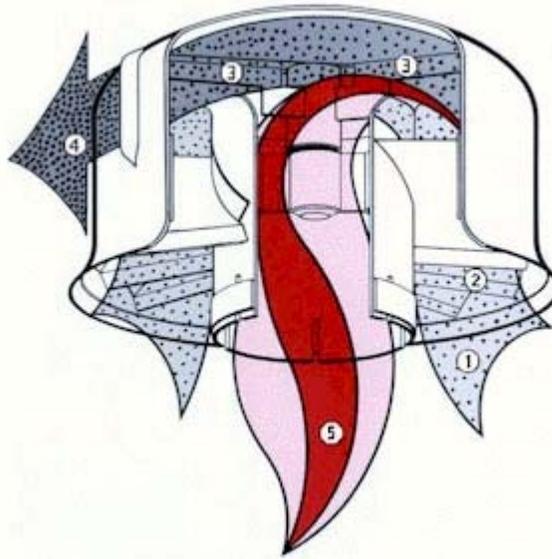
1. Dirty air enters the precleaner which is attached onto the engine's air intake.

2. Vanes, curved and angled to direct air flow, move the dirty air toward the stainless steel impeller.

3. The impeller creates centrifugal force inside the housing.

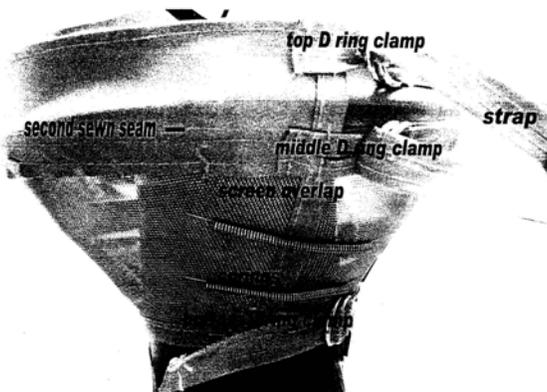
4. The centrifugal force expels the heavier than air dirt particles, chaff, dust, snow, rain, etc., out the discharge louver.

5. Cleaned air enters the engine intake pipe, and the filter element has only the very light particles to remove.



6. In addition to the features of the precleaner, DRM Diversafab developed a prescreen for positive ember control that prevents any particle larger than .039 inches from entering the precleaner.

HOW TO INSTALL:



1. Install Adaptor or Stack Extension on to engine air inlet pipe. Push down until the metal expansion slots are fully sealed by the engine air inlet pipe. Install the Stainless Steel Clamp and position in the middle of the expansion slots. Tighten clamp to a maximum of 7.5 ft. lbs. or 90 inch lbs.

Caution: Do not over tighten clamp.

2. Push EX50 precleaner on to the Adaptor or Stack Extension so expansion slots are fully sealed. Install stainless steel clamp and position about a $\frac{1}{4}$ " above the lower edge of the precleaner base or edge. Tighten clamp to a maximum of 7.5 ft. lbs. or 90 inch lbs.

Caution: Do not over tighten.

3. Wrap the HH prescreen around the precleaner so that the wide, gray upper end is above the lower edge of the precleaner hood. Identify the second sewn seam from the top of the prescreen and position the seam .125" below the edge of the lower edge of the hood.
4. Grab the top clamp strap, feed under D rings, fold around top D ring and feed through the lower D ring only Pull strap through until prescreen stays in place on the precleaner and the 2nd seam is located an .125" below the edge of the hood.
5. For the middle and bottom clamp straps, grab strap, feed under D rings, fold around top D ring and feed through the lower D ring. Pull strap until the excess material is removed, the vertical edges of the prescreen overlap and the bottom of the prescreen wraps around the adaptor or extension. Do not tighten at this time.
6. Starting with the top clamp strap, pull it tight. Remove or flatten any gaps, openings or gathered material places so that the prescreen lays flat and seals against the precleaner hood and at the overlap. This seal prevents an ember from entering the internal precleaner air flow.
7. For the middle clamp strap, pull it tight. Remove or flatten any gaps, openings or gathered material places along the vertical prescreen overlap edge so it lays flat and seals. **Caution:** Do not over tighten so as to buckle or deform the pre screen material. This seal prevents an ember from entering the pre cleaner through the overlap area. Note: the screen has been designed to block a larger size ember (greater than .036") from entering the internal precleaner air flow.
8. With the bottom clamp strap, pull it tight. Remove or flatten any gaps, openings or gather material places so that the prescreen material lays flat and seals against the adaptor or stack extension and at the overlap. **Caution:** Do not over tighten so as to buckle or deform the prescreen material. This seal prevents an ember from entering the precleaner air flow.
9. Visually inspect each clamp, the overlap edge, top and bottom for gaps, opening or buckling. Adjust clamps and material until the prescreen is free of gaps, openings or buckling.
10. Locate the two silver tension springs supplied with each kit. Position each spring evenly and horizontally across the vertical overlap directly above any potential gaps or openings. Push one end in to the prescreen. Stretch the spring across the overlap and push the other end in to the prescreen. Repeat the same process with second spring. **Caution:** Do not overstretch the spring so as to buckle or deform the prescreen material. Each spring increases sealing to prevent an ember from entering the precleaner through the overlap area.

**AIR FLOW RESTRICTION DATA ON HIGH HEAT STAINLESS STEEL SCREENS
HIGH HEAT SCREEN #48-5040S, AND HIGH HEAT SCREEN #48-5050S**

Precleaner Tested: EX50

Date: 11/13/08

Temp. 50 / 55 F

By: Ron R.

Test #1	Registered CFM W / Water Column	4 X 20 Str. Pipe 37-5040 Adaptor	Precleaner Restriction	48-5040S Restriction
1	269 / .5	0.6	1.7	1.7
2	381 / 1.0	1.35	3.3	3.5
3	466 / 1.5	2.2	5.2	5.45
4	537 / 2.0	2.85	6.9	7.2
5	657 / 3.0	4.35	10.5	11
6	757 / 4.0	5.7	13.9	14.15
7	845 / 5.0	6.9	17	17.8
8	925 / 6.0	8.45	20.3	21.3

Test #2	Registered CFM / Water Column	5 X 24 Straight Pipe Restriction	Precleaner Restriction	48-5050S Restriction
1	269 / .5	0.4	1.4	1.4
2	381 / 1.0	0.95	2.8	2.8
3	466 / 1.5	1.4	4.3	4.4
4	537 / 2.0	1.85	5.5	5.8
5	657 / 3.0	2.8	8.5	8.55
6	757 / 4.0	3.7	10.9	11.6
7	845 / 5.0	4.5	13.6	14.2
8	925 / 6.0	5.6	16.1	16.9

NOTES: The test was completed to verify air flow restriction between an:

- EX50 Centri Precleaner with no screen
- EX50 Centri Precleaner w/ low profile screen #48-5050S / 12" adaptor #24-50012
- EX50 Centri Precleaner w/ mid profile screen #48-5040 / 5" to 4" reducer #24-5040
- EX50 Centri Precleaner w/ tall profile screen #48-5050

An additional test was done after the restriction tests were completed. At 845 CFM a piece of plastic was placed across 1/2 of the screen to represent a plugged screen condition. There was no increase restriction noticed on either screen.

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