



# **Maintenance Manual for All Standard Radiator Models**

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### III GENERAL MAINTENANCE

Most IEA radiators are nearly maintenance free. Minor maintenance items should be performed to ensure your IEA radiator operates at top performance and to avoid hazards.

#### A.) **Cleaning**

Periodically inspect the radiator core for signs of damage, corrosion, and clogging. Straighten any fins that have become bent or have been flattened. If the radiator core appears to be clogged with debris, it should be cleaned using water

and mild detergent that does not react with copper or aluminum. Clean the cores from the AIR DISCHARGE side of the radiator to avoid pushing the debris further into the core. Clean the outside of the radiator, if dirty, to aid in routine inspection of the cooling system. Take care to keep all sight glasses clean to ease system fluid inspection. **CAUTION:** Fan Bearings and Motors should not be sprayed with water or cleaner. Directly spraying could WASH-OUT the Fan Bearing and/or Motor Bearing grease which can lead to premature bearing failure. After washing the radiator, proper lubrication of Fan and Motor Bearings is always recommended. Refer to the Lubrication Section of the IOM. Repair or replacement of the core should be performed by qualified service personnel. If any air filters are used upstream of the core, inspect and replace as needed.

Periodically test coolant fluid samples to assure it is free of sediment, corrosive products, and/or biological contaminants. If automatic air vents are not used in the cooling system, periodic air venting should be performed to remove accumulated air. **CAUTION** should be exercised when venting the cooling system to avoid injury. High pressure and/or high temperature fluids can cause serious injury. If the core is to be stored during the winter, the coolant should be removed and the system thoroughly dried to avoid system damage due to freezing, unless an anti-freeze agent is used in the cooling system.

## B.) Lubrication

Radiators using bearings require greasing at an interval dependant upon their usage. The table below shows a lubrication maintenance schedule according to service hours. All motor bearings should be greased with Mobil Polyrex EM polyurea base grease or equivalent. All fan bearings should be greased with Certified Labs Premalube Red aluminum complex base grease or equivalent. DO NOT MIX GREASE TYPES. Radiators requiring different lubricant or lubrication methods will be specified on the radiator drawing.

Table 1

<u>SERVICE HOURS</u>	<u>LUBRICATION FREQUENCY</u>
40 Hours per Year	Every Six Months
18 Hours per Day	Twice a Month
18 Hours per Day (Dirty Environment)	Once Each Week
24 Hours per Day	Once Each Week
24 Hours per Day (Dirty Environment)	Daily

When lubricating pillow block bearings, add greases slowly until it shows slightly at the seals. This indicates proper bearing lubrication. The use of excessive pressure when greasing the bearing can pop the bearing seals. Electric motor bearings should always be kept between  $\frac{1}{2}$  and  $\frac{3}{4}$  full. This will ensure proper

lubrication to the motor. Both pillow block and electric motor bearings should be serviced using the maintenance schedule listed above.

## C.) Belt Tension

Radiators using V-belt driven fans should have the belt tensions checked regularly. On remote units, belts and sheaves are installed by IEA. On EC-F type units, belts and sheaves may be supplied by IEA, but are mounted by the customer. IEA recommends periodic checks using a tachometer to ensure compliance of fan speed to specifications.

1. All sheaves MUST be aligned correctly to  $\pm 0.0625$ , or premature belt failure may occur. Use a long level to check sheave alignment (see Fig 31).
2. Install the belts onto the sheaves. Tension the belts on the slack-side of the drive with the idler until the correct belt tension is achieved. Follow the operating instructions of the belt tensioning gage being used to measure belt tension.
3. Recheck the belt tension after 24 hours of operation – after the belts have seated in the sheave grooves.

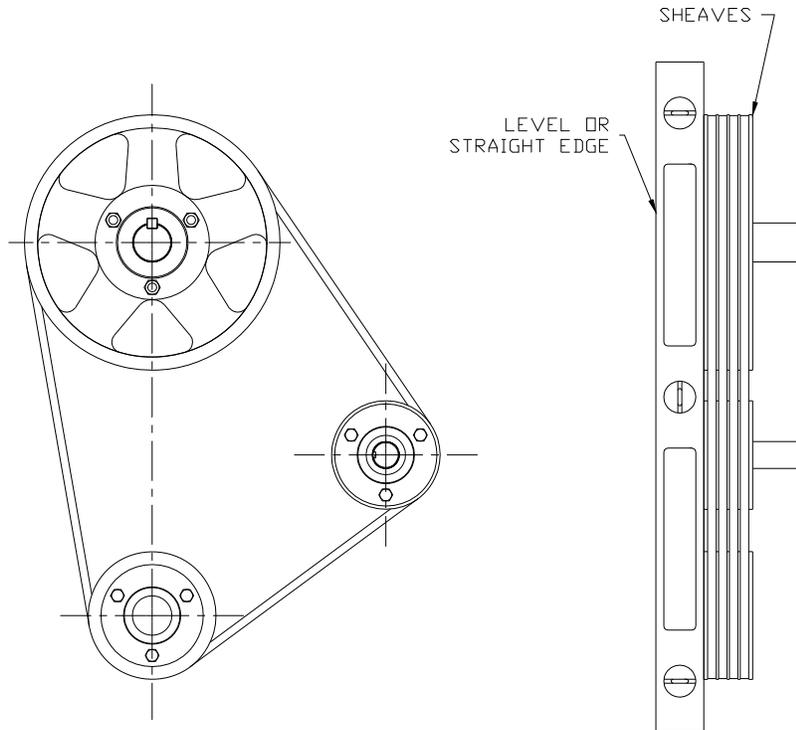


FIG 31

#### D.) Idler Adjustment (Old Style - Fig 32)

##### Tightening Belts:

1. Loosen the four 5/8" nuts (A) on the top of the idler assembly.
2. Turn the idler screws (B & C) clockwise, alternating tightening every two turns.

**DO NOT** use an air impact wrench on the adjustment screws.

Notice the outside belts cause the idler shaft to misalign. This reduces the tension on the inner belts, and should be corrected. To correct this situation, turn the inside idler screw (C) counter-clockwise until the idler shaft is correctly aligned.

3. Repeat step two if necessary to achieve correct belt tension.
4. Tighten the four 5/8" nuts (A) to the correct torque.

Note:

1. It is very important for the sheaves to be in alignment to ensure proper belt wear.
2. DO NOT loosen the four bolts (D) holding the upper bearings to the tapped plate (E). This assembly is independent of the 5/8" nuts (A).
3. Check the torque on the bearing set screw (F). Proper torque is 19 ft. lbs.
4. Check the torque of the four bolts (G).
5. Periodically grease the idler adjustment screws (H) to ensure belt adjustment ease.

## Loosening Belts:

1. Loosen the four 5/8" nuts (A) on the top of the idler assembly.
2. Turn the idler screws (B & C) counter-clockwise, alternating tightening every two turns.

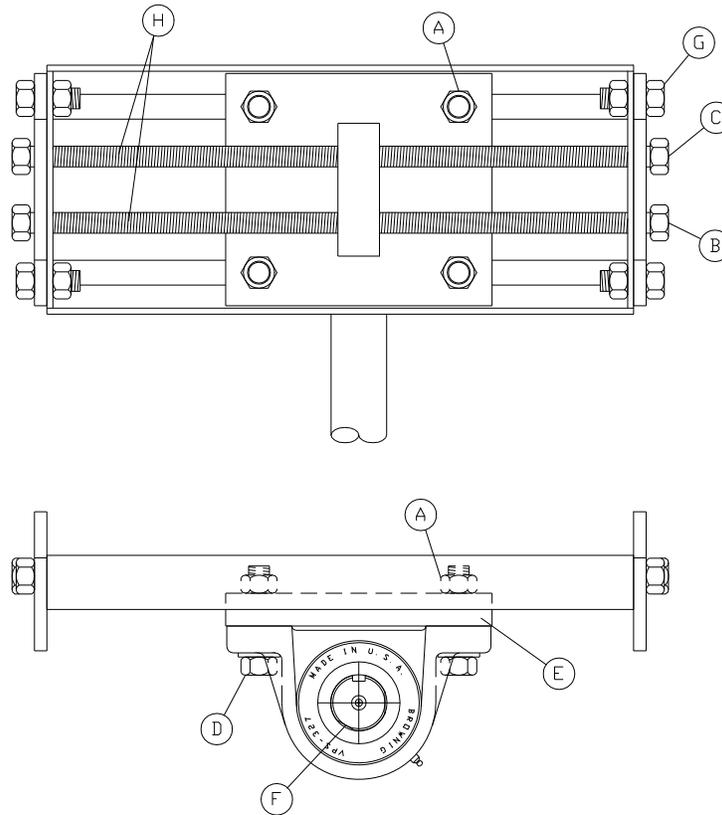


FIG 32

## E.) Idler Adjustment (New Style - Fig 33)

### Tightening Belts:

1. Loosen the two 3/4" bolts (A) on the back of the idler assembly.
2. Loosen the jamb nut (C) on the idler adjustment screw.
3. Turn the idler adjustment nut (B) clockwise.
4. Repeat step three if necessary to achieve correct belt tension.
5. Tighten the two 3/4" bolts (A) to the correct torque.

## Loosening Belts:

1. Loosen the two  $\frac{3}{4}$ " bolts (A) on the back of the idler assembly.
2. Loosen the jamb nut (C) on the idler adjustment screw.
3. Turn the idler adjustment nut (B) counter-clockwise.

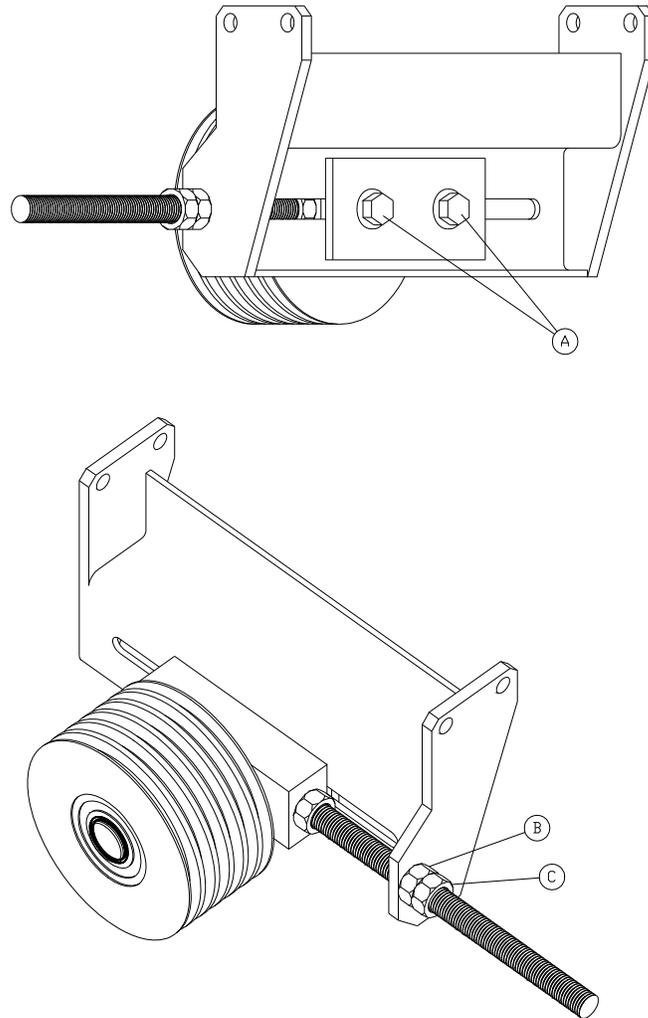


FIG 33

## F.) Bolts

Almost every component on an IEA radiator is bolted for ease of maintenance and service. Bolt torque should be routinely checked to verify all bolts are tight, especially the bolts joining the top tank to the core header. All tank to header bolts should be torqued to 25 ft. lbs., while all other bolts are not to exceed their standard dynamic assembly torque.

**IMPORTANT:** Upon the initial fill of the radiator, slight coolant seepage may appear around the tanks. This is due to drying of the core gaskets during shipment. If this occurs, allow the gaskets to soak over night, then retorquing the tank to header bolts to the specified torque. Loosen the corner reinforcement bolts which bolt to the sidemember. Begin retorquing the head bolts from the center, and move outward to the end of the tank. All header bolts must be retorqued during this procedure - partial retorquing will promote header leakage. Tighten the corner reinforcement bolts.

**TABLE 2: HUB BOLT TORQUE CHART**

HUB TYPE	BOLT TYPE	TORQUE	
		IN. LBS.	FT. LBS.
H	1/4-20 X 5/8	95	8
SH, SDS	1/4-20 X 1 3/8	108	9
SD	1/4-20 X 7/8	108	9
P1, P2, P3	5/16-18 X 1	192	16
SK	5/16-18 X 2	180	15
Q1, Q2, Q3	3/8-16 X 1 1/4	348	29
R1, R2	3/8-16 X 1 3/4	348	29
SF	3/8-16 X 2	360	30
S1, S2	1/2-13 X 2 1/4	840	70
E	1/2-13 X 2 3/4	720	60
F	9/16-12 X 3 5/8	920	75



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# Paint Maintenance Guide

## *ON THE WALL COMMERCIAL FINISHE*

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December 03, 2020



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**December 03, 2020**

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<b>Description:</b> F63ZXG1523-1495	<b>Product:</b> 19557831	<b>Substrate:</b> Galvanized	<b>Area:</b> Galvanized Metal
<b>Color:</b> C/M - Dark Green	<b>Label:</b> Finish	<b>Order #:</b> OE0008354A14	

*Due to screen and print limitations, colors seen here may not accurately reflect painted colors. To confirm your color choices, visit your neighborhood Sherwin-Williams store*

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<b>Description:</b> F63ZXG1524-1495	<b>Product:</b> 19557843	<b>Substrate:</b> Galvanized	<b>Area:</b> Galvanized Metal
<b>Color:</b> C/M - Light Green	<b>Label:</b> Finish	<b>Order #:</b> OE0008354A14	

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<b>Description:</b> Polane® HS Plus, SP & High Solids Clear Catalyst (Exterior)	<b>Product:</b> V66V00055	<b>Substrate:</b> Galvanized	<b>Area:</b> Galvanized Metal
<b>Color:</b> Part B Catalyst -	<b>Label:</b> Finish		

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## Care and Cleaning of Interior and Exterior Coatings

### **Background:**

Establish procedures to maintain and clean interior and exterior painted substrates. To assure maximum washability and durability, wait at least two weeks before washing the dry paint film. Exterior coatings typically are very soft and flexible to allow for expansion and contraction of the coating during changes of temperature. Any hard scrubbing of standard exterior coatings is likely to damage the film. To clean and maintain the interior and exterior surfaces, we recommend these procedures.

### **Concentrated Cleaners, Liquid or Dry:**

- Read all the package directions before using. It is always recommended to test any cleaner on a small, inconspicuous area prior to use.
- Mix or dilute the cleaner per package instructions. Solution strength may be adjusted depending on amount and type of soil.
- Remove any heavy debris and contaminants.
- Using a sponge or cloth, wash surface dirt and marks.
- Do not allow the cleaner to dry on the surface.
- Always clean from the bottom of a wall to the top.
- Rinse the surface thoroughly.
- Repeat if necessary.

### **Premixed Spray Cleaners:**

- Read all the package directions before using. It is always recommended to test any cleaner on a small, inconspicuous area prior to use.
- Turn spray nozzle to desired spray pattern. (Open with nozzle facing away from you.)
- Remove any heavy debris and contaminants.
- Apply the cleaner to the dirt and marks; apply just enough to wet the area.
- Using a damp sponge or cloth, wipe to remove the surface dirt and marks and any excess cleaner. For difficult stains, some scrubbing may be necessary.
- Do not allow the cleaner to dry on the surface.
- If recommended on the cleaner package, rinse the surface thoroughly.
- Repeat if necessary.
- Return spray nozzle to the closed position.

### **Cautions:**

- Thoroughly read and understand all the label cautions prior to using any cleaner.
- Be sure that the cleaner is appropriate for the dirt/contamination.
- Do not mix together any cleaning compounds containing bleach and ammonia.
- Abrasive cleansers may damage a paint film, use very carefully.
- Bleach and bleaching type cleaners may damage or discolor existing paint films. Bleach alternative cleaning solutions would be advised.

### **WARNING!**

- Removal of old paint by sanding, scraping or other means may generate dust or fumes that contain lead. Exposure to lead dust or fumes may cause brain damage or other adverse health effects, especially in children or pregnant women. Controlling exposure to lead or other hazardous substances requires the use of proper protective equipment, such as a properly fitted respirator (NIOSH approved) and proper containment and cleanup. For more information, call the National Lead Information Center at 1-800-424-LEAD (in US) or contact your local health authority.



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## Care and Cleaning of Interior and Exterior Coatings

### The Sherwin-Williams Company Cleaning Products

**SuperDeck® Deck Wash** is designed to bring back the fresh, natural look of your deck. Enjoy the self-working, no scrub formulation. This product is an excellent choice to restore your surface or to use as a pretreatment for staining, preserving, or sealing. Use on decks and outdoor furniture made of pressure treated wood, cedar, pine, and most other woods. This product is intended for exterior use only.

**SuperDeck® Stain & Sealer Remover** is specifically designed to remove most semi-transparent and weathered solid latex and oil-based stains from decks and other exterior wood. SuperDeck Stain & Sealer Remover allows you to change the color of your deck or siding by restoring the natural beauty of the wood. SuperDeck Stain & Sealer Remover can be used on most exterior wood surfaces such as decks, siding and fences and will remove the following stains and finishes:

- Polyurethane and some weathered latex paint.
- Oil-based toners, semi-transparent, and weathered solid stains.
- Water-based toners, semi-transparent, and weathered stain.
- Water-reducible toners, semi-transparent and weathered solid stains.
- Old, weathered, clear protective finishes.

SuperDeck Stain & Sealer Remover will restore color to severely weathered and discolored wood.

**SuperDeck® Revive® Deck & Siding Brightener** is a fast-acting, ready-to-use cleaner specially formulated for cedar, redwood and other highly resinous exterior woods as well as dense woods such as mahogany. Due to the chemical characteristics of these types of woods, traditional cleaners can leave the surface with an unnatural, darkened appearance. SuperDeck Revive Deck & Siding Brightener will help remove dirt and unsightly stains caused by mildew and algae, gray and weathered wood, tannin bleed and nail bleed as well as stubborn mill glaze (a surface barrier to wood coatings found on most newly installed cedar and redwood) and restore the surface to its bright, clean natural look. SuperDeck Revive Deck & Siding Brightener can be used on any new or existing exterior structure including wood decks, fences, siding, shakes, shingles, boat docks, boardwalks, outdoor furniture, picnic tables, hot tubs, planters, benches, trellises and gazebos.

**H&C Concrete Etching Solution** is a phosphoric acid-based etcher that has been developed to acid etch concrete surfaces before applying H&C Silicone Acrylic Concrete Sealer, H&C Shield Plus Concrete Stain, and other coatings. Uses: • Basement floors and walls • Garage floors, carports and driveways • Porches, patios, walkways, steps • Swimming pool aprons • Recreation areas • Parking structures and parking lots • Retaining walls • Containment areas • Tilt-up construction • Removes efflorescence (alkali salts) • Reduces the pH of new concrete and new mortar joints.

**H&C Degreaser** is a concentrated heavy-duty cleaner that will remove most automotive fluids (oil, grease, brake fluid, transmission fluid, gear fluid and antifreeze) from concrete and masonry surfaces. Its primary use is to degrease and prepare concrete, block, brick, and masonry. Features: • Removes grease and oil stains • Prepares surfaces for paints, stains, and sealers • Increases any coating's ability to bond with the surface by providing a clean substrate Recommended Uses: • Stadium Supports • Bridges and Bridge Structures • Parking Garages • Patios and Walkways • Pool Decks • Concrete Driveways • Garage Floors • Block & Stucco Walls • Athletic/Tennis/Shuffleboard Courts • Other Concrete Surfaces • Use prior to etching



## BASICS OF TOUCH-UP

Often a painted area needs repair. Usually the damaged area is small and is repaired using a brush and roller. The art of repair is called "touching up" and there are many problems in making the repair as invisible as possible. Prerequisites for achieving good "touch-up" are that the paint be of the same color as the original, from the same manufacturer, from the same batch of paint and, ideally, from the same can, and that the area to be repaired has the same texture and appearance of the surrounding area.

If the "touch-up" patch is visible under all illumination conditions then it is poorly done; if one must search for it, then the "touch-up" is good.

### **COMPONENTS OF "TOUCH-UP"**

Touch-up complaints are often not specific about what aspect makes the repair visible. In fact, there are three separate and identifiable components that can be included in a "touch-up" problem. All three components contribute to the visibility of the repair and stem from the use of different application techniques for the original paint and the repair. Usually a brush repair over an airless sprayed original will be very visible. Most of the following comments concern that situation, but they can also be applied to other combinations. On some jobs one problem may be visible, on others they may occur in combinations. It is much easier to understand the cause of the poor "touch-up" if the problem components are identified.

#### **1. "HALO"**

Halo's are created at the edge of the repair by tendrils of paint left by the brush as it enters and exits the area around the patch. Human eyes are very good at determining texture changes and are thus very sensitive to touch-up and "halo" in particular. The texture is more raised in these areas than the main part of the repair, so they produce shadows when illuminated from the far side and reflect light back to the observer when illuminated from the same side.

A painter can make the situation worse by attempting to feather the repair excessively. This creates more edge texture. Halo is diminished if the paint spreads smoothly and continuously over the original layer. If the repair paint thickens in viscosity rapidly as it is spread then it will not level well and the texture at the edge will be especially bad. Thus patching over porous paint, e.g. a flat paint, is more likely to cause a "halo" problem. In the field the "halo" problem may be alleviated by stippling with a brush or otherwise trying to duplicate the texture of the original. Diluting the repair paint by 10-15% may help by accommodating the wicking problem.

#### **2. DIFFERENT SHEEN**

This part of the "touch up" problem is noticed as a difference over the whole repair patch particularly at oblique angles. The patch appears either shiny or dull compared to the background. The effect may be accompanied by a "halo".

Features larger than three mil, e.g. brush marks, roller stipple etc., produce shadowing or reflections like the "halo", but not a change in sheen. Sheen differences are due to changes in the way the light is scattered from smaller features, i.e., roughness, in the paint surface. The shape and the arrangement of the paint ingredients are what determine this. Changes in surface roughness are most visible at grazing angles of observation and illumination. This is often the way that poor touch-ups are first noticed. Drying conditions and application technique are important factors in determining surface roughness. Although paint can be formulated to minimize their importance, sheen differences may be seen when the original paint and the repair paint are applied differently or under widely different temperature and/or humidity conditions.

#### **3. COLOR DEVELOPMENT**

This problem is much less likely to occur than the other two types of touch-up problem. It most often appears as a difference in the depth of the color rather than a color shift, and can be seen at almost any angle of observation, but particularly near the perpendicular (90° angle) in contrast to the "halo" and "sheen" components above.

Changes in the way light is scattered from within the body of the paint film are most visible straight on for both observation and illumination. Poor color touch-up results from differences in pigment particle separation caused by the differences in application techniques, e.g. brush vs. airless spray. Airless spraying inputs a very great deal of energy into paint and disperses pigment very well. Brushing or rolling shear-rates are two to three orders of magnitude less severe and may not disperse paint components in the same way.

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