



765 Service Manual

**FORT WAYNE
RAILROAD**
HISTORICAL SOCIETY INC.

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Fire Up Procedure

Preparations

- 1 Open vent valves (between the safety valves/ air pump vent behind the stack).
- 2 Open both feedwater check valves.
- 3 Load a level 4-inch bed of coal in the firebox covering all the grates.
- 4 Load dry wood in firebox, with an emphasis on placing wood in the back corners and middle in front of the pot.
- 5 Put oil or kerosene soaked rags in the center of the pile and light off. You could also pour kerosene/diesel on a few scoops of coal prior to lighting and sprinkle them around.
- 6 Attach compressor or shop air to blower line and open blower.
- 7 Light fire with a fusee, only use additional fusee if necessary.
- 8 Approximately 3-4 hours before pressure shows on the gauge.
- 9 Disconnect shop air when steam pressure will operate blower.
- 10 Close the vent valves once steam begins venting forcibly.

Regulate blower usage as steam pressure rises. Raise steam pressure slowly. Approximately 8 hours should pass before the locomotive is at operating pressure.

When at Operating Pressure

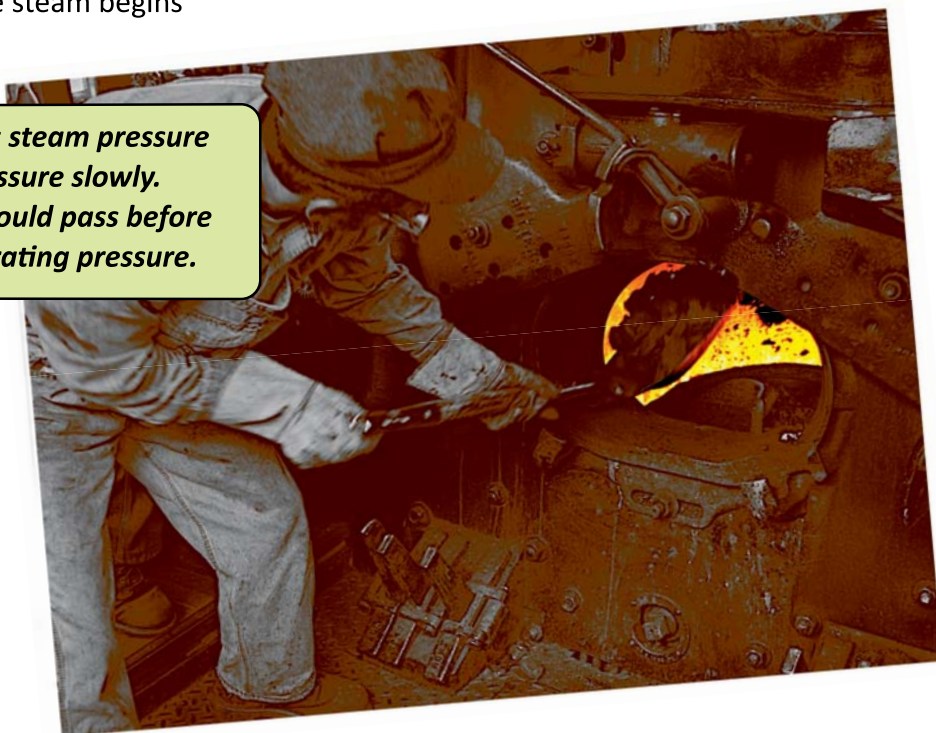
Open main steam turret valve.

- Test both water glasses, gage cocks and blow down water column (page 3)
- Test injector (page 2)
- Test feedwater system
- Test low water alarm (page 4)
- Start up air compressors (page 2)

Check the following for correct operation:

- Turbo and all lights
- Sanders
- Rail washer
- Bell
- Whistle

Raise steam pressure to test pop valves.





Hostling Activities

Firing

- Keep adding coal around side sheets and backhead. Fire the remaining grate as need to maintain pressure
- Maintain pressure (175 to 230 — keep steady)
- Blower should be set only strong enough to keep smoke out of the cab.
- Rattle the grates occasionally to keep ash down. The fire should be cleaned before turning the engine over to the road crew

Proper use of Blow Down

- Use blow downs only when total dissolved solids (TDS) is greater than 2,500.
- Before blowing down have a good hot fire and plenty of water in boiler
- Open blow down all the way, slowly, for 3 – 5 seconds
- Slowly close valve

Note: *The best time to blow down is when the boiler is not working hard. When possible, blow down before breaking the bank in the morning, after checking the water level in the boiler.*

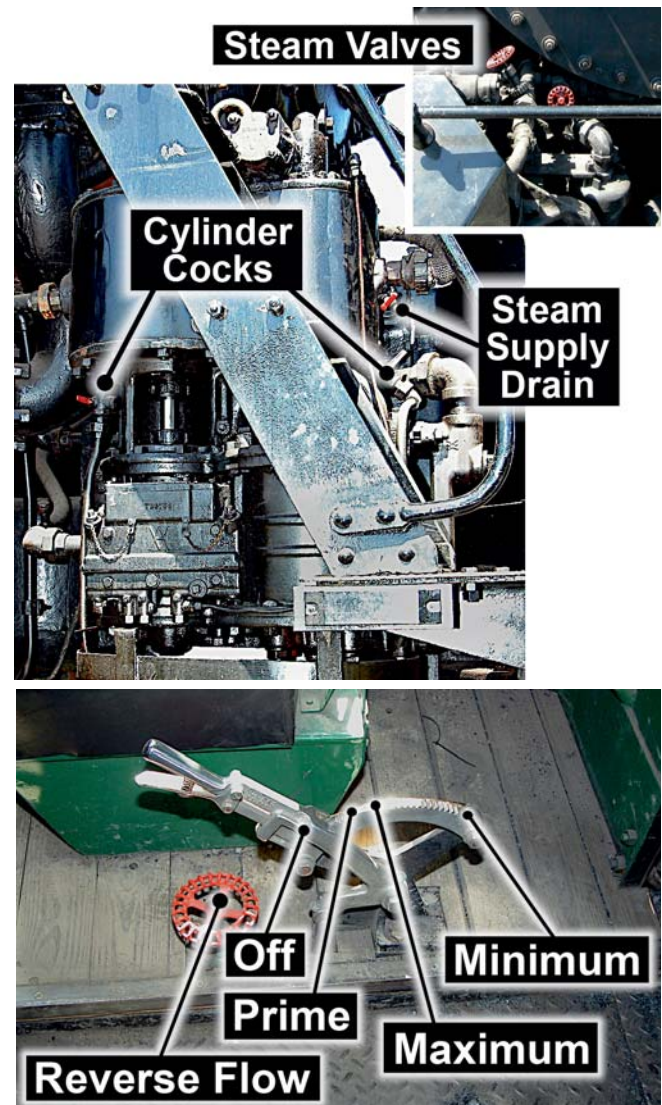
Use of Injector

- Have a good hot fire with pressure rising
- Move operating lever to prime position
- Observe water flowing out overflow underneath cab
- Move operating lever to maximum position
- Injector should only be operated for 10 – 15 seconds
- Reduction in boiler pressure should not exceed 5 pounds except in an emergency.

Reverse Flow: *It's only used under cold weather conditions to prevent freezing by injecting steam into the water inlet line and into the tender.*

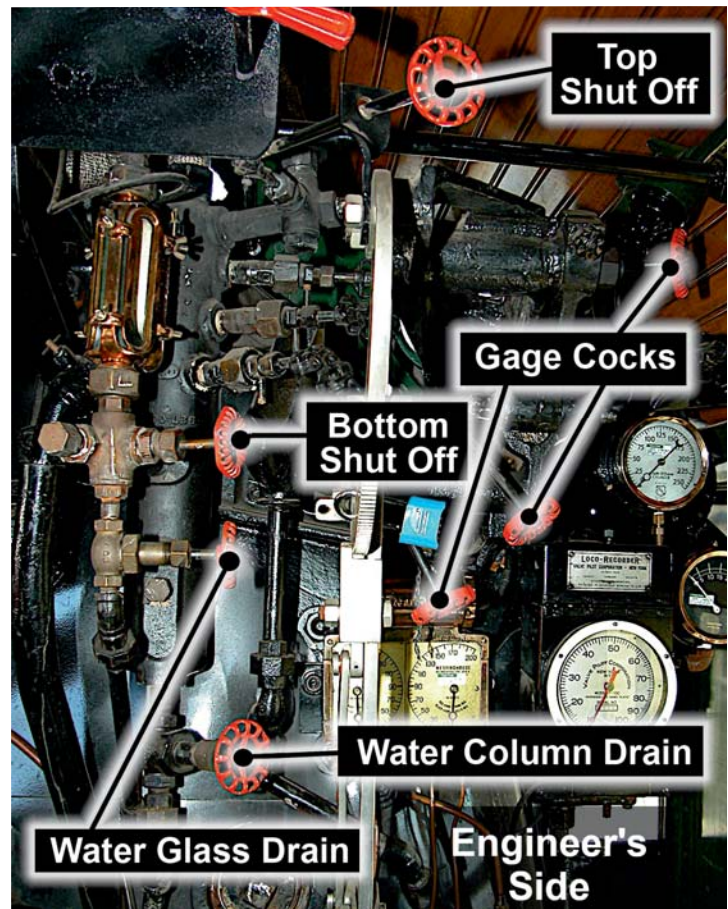
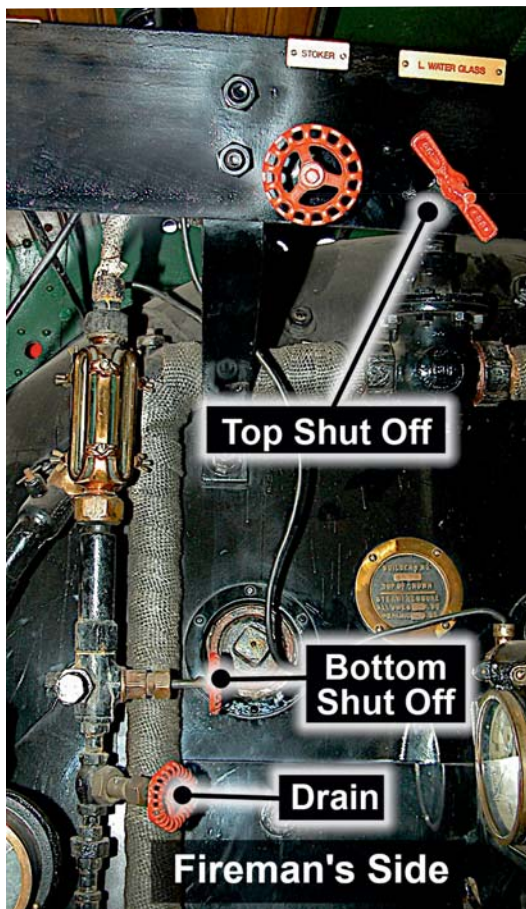
Starting Air Compressors

- 1 Crank oil pump 25 times and then do the same with the F-2 lubricator on the pump
- 2 Open cylinder cocks & steam supply drain to release any built-up water
- 3 Open air tank drains to release condensation
- 4 Open steam valve about ¼ turn
- 5 Open steam valve until compressor just starts to pump
- 6 After one minute close drains on air tanks
- 7 Close cylinder cocks and steam supply drain
- 8 Allow air pressure to build in reservoirs
- 9 Open steam valve slowly until fully opened





Test Water Glasses



Testing Water Glasses

Completed at the beginning of each shift and before departure. This procedure must be done to both water glasses.

- 1 Close lower shutoff valve
- 2 Open drain valve
- 3 Close upper shutoff valve - there should be no flow of steam or water
- 4 Open lower valve
- 5 Open top valve
- 6 Close drain valve

Water should return to the glass rapidly. If it does not, repeat the process. If water still does not return rapidly, report problem to the chief mechanical officer.

Blowing down Water Column

- Completed at the beginning of each shift and before departure
- Open the drain valve and allow to blow for 4 – 5 seconds
- Close the drain valve

Testing Gage Cocks

- Completed at the beginning of each shift and before departure
- Completed after water glasses and water column have been blown down
- Start with the highest valve, open and allow to blow for 4 – 5 seconds
- Repeat with the remaining two valves



Test Low Water Alarm, Safety Valves, Turbo

Low Water Alarm

The Low Water Alarm should be tested at the beginning of each shift and before departure.

- 1 Check main shutoff valve on top of locomotive to ensure that it's open
- 2 Open test valve in short bursts until low water alarm begins to sound. Overheating the tube will delay the resetting of the alarm
- 3 Close valve and raise release lever on whistle

Safety Valves

Slowly work steam pressure up to 245 pounds. At that point the first safety valve should open.

Use injector to add water and lower pressure.

(Do not operate for more than recommended time)



Note: if safety valve does not open, add water to boiler and notify mechanical officer in charge.

Turbo Generator

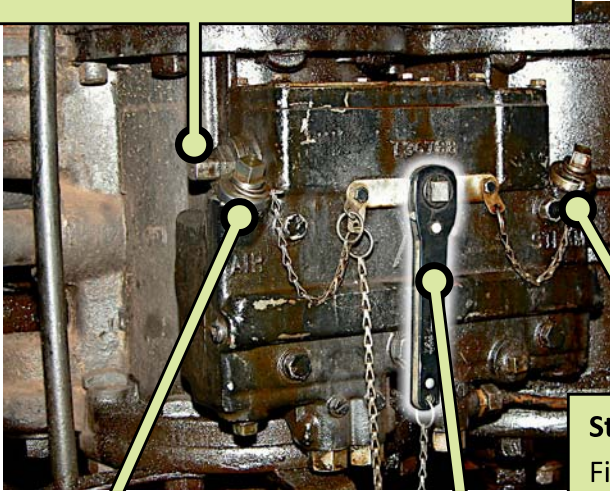
- Start turbo and listen for unusual noises
- Check all lights for operation
- Check the electrical panel for each generator's output and load. Adjust load if necessary



Air Compressor & Valve Gear Lubrication

Crank

Crank here 25 times before starting the air pump. The oil pump will "click" each time it cycles. Crank in the direction of the arrow on the lubricator. The crank should move easily. **DO NOT FORCE IN REVERSE DIRECTION.**



Hydrostatic Lubricator

Drain condensation and fill with valve oil.

Air Side

Fill with carbonless compressor oil, AKA Air Oil, which is a light oil yellow in color.

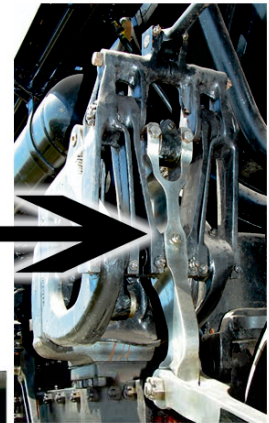
Wrench

Used to crank the oil pump to distribute oil prior to starting the air pump.

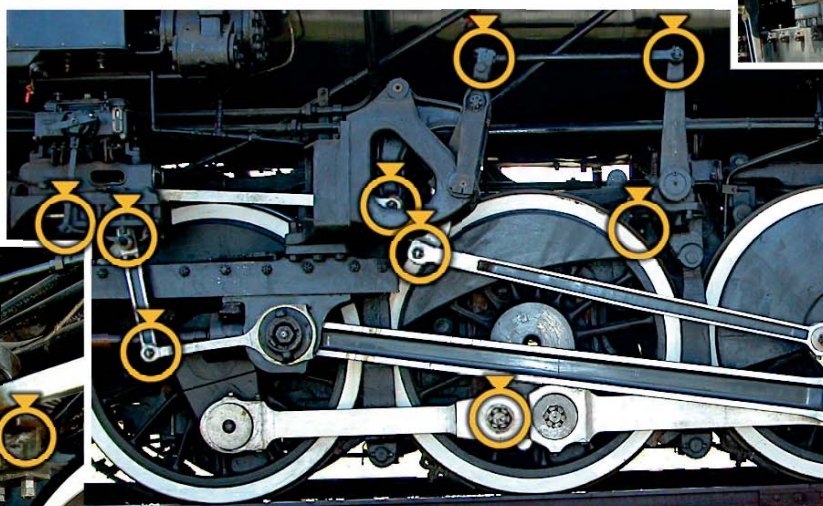
Steam Side

Fill with valve oil which is thick and colored black to dark green.

Multiple Fittings



Fittings Inside



Soft Grease Fitting



Locomotive & Tender Lubrication

Throttle
Soft grease

Mechanical Lubricators

Brake Hangers
One fitting at the top and the bottom of each hanger. Soft grease.

Power Reverse
Soft grease

Trailing Truck
Three oil cups on top - Journal Guard 1200
Rockers at rear of truck - Soft grease

Tender Trucks
Two oil cups on each side of each truck. Also oil pivot below oil cup. Also oil bolster wear plates. Use Journal Guard 1200.

Truck Center Plate
One fitting for each center plate. (Engineer's side only) Soft grease.

Injector Oil & Grease
Soft Grease (Behind)
Soft Grease

Journal Guard 1200

Blow Down
Use packing grease weekly or as needed at all four blowdowns.

Engineer's Side
Fill with valve oil. Crank 25 times before departure.

Fireman's Side
Fill with Journal Guard 1200. Crank 25 times before departure.

Brake Hangers
One fitting at the top and the bottom of each hanger. Soft grease.

Power Reverse
Soft grease

Trailing Truck
Three oil cups on top - Journal Guard 1200
Rockers at rear of truck - Soft grease

Tender Trucks
Two oil cups on each side of each truck. Also oil pivot below oil cup. Also oil bolster wear plates. Use Journal Guard 1200.

Truck Center Plate
One fitting for each center plate. (Engineer's side only) Soft grease.

Injector Oil & Grease
Soft Grease (Behind)
Soft Grease

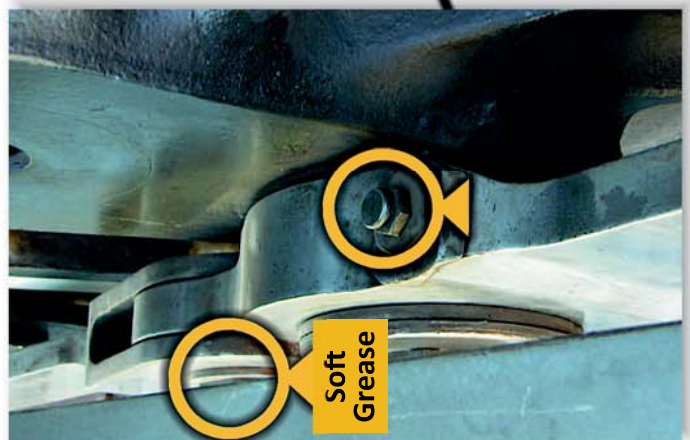
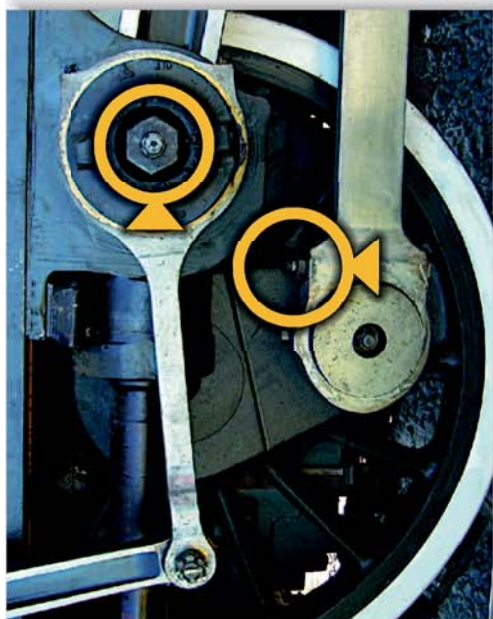
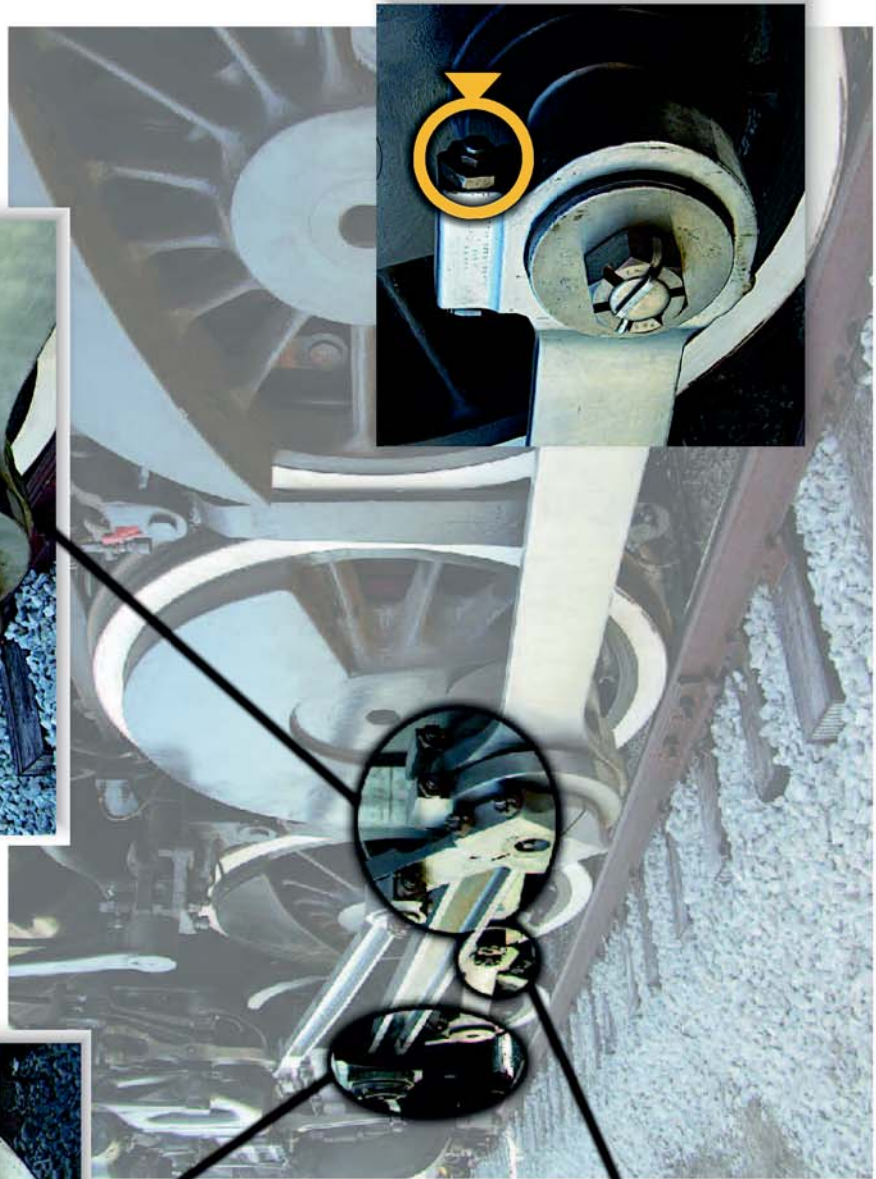
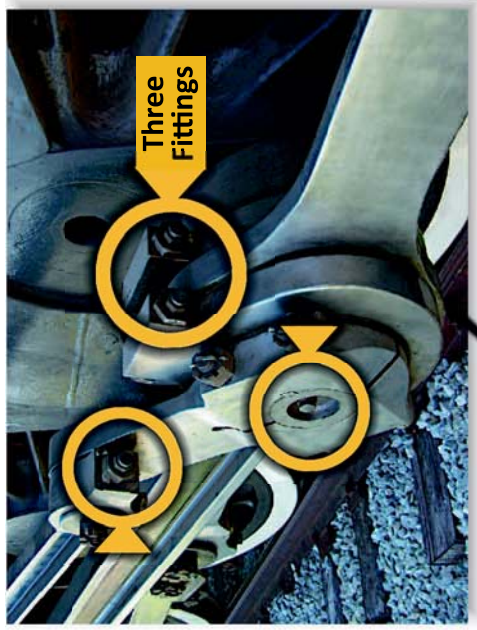
Journal Guard 1200
Red oil and tacky

Valve Oil
Thick black to green oil

Air / Compressor Oil
Thin yellow color

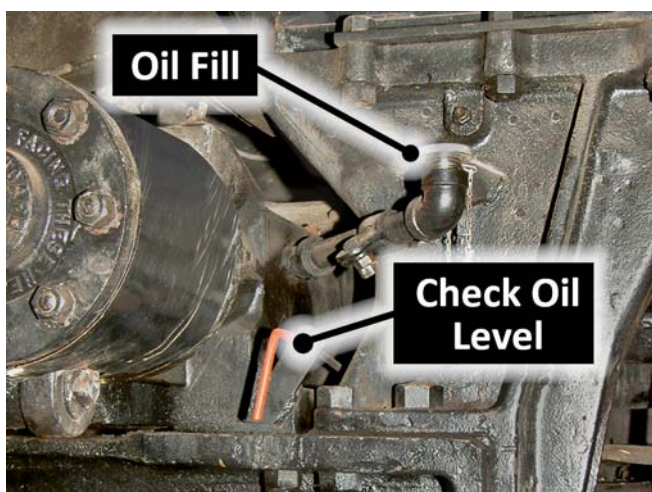


Rods, Crosshead Pins, Main Crank Pin





Stoker, Cold Water Pump, Turbo Generator

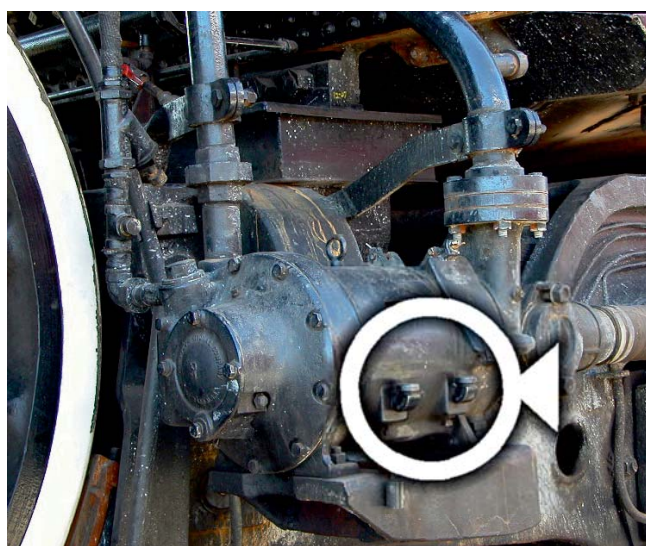


Stoker Engine

- 1 Drain water from the crankcase. Remove the pipe cap and open hand valve until water changes to oil.
- 2 Operate lever to check the oil level. If oil comes out, oil level is ok.
- 3 Fill as needed with Stoker Crankcase Oil which separates from water readily. This is a 30 weight oil that is dark yellow in color.

Stoker Crankcase Oil

30 weight, dark yellow color

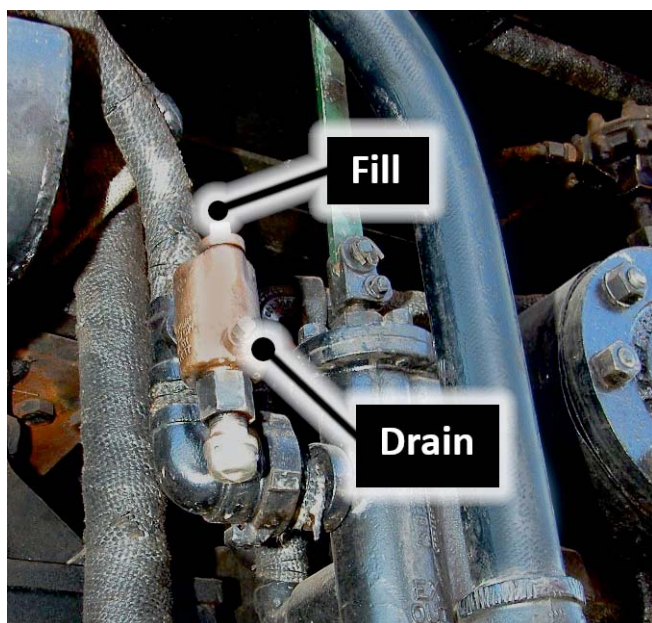


Cold Water Pump

- Two journals
- Check and fill with turbine journal oil

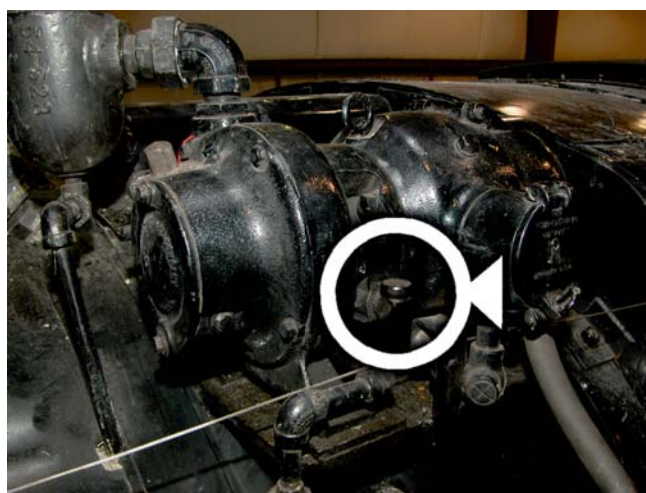
Turbine Journal Oil

30 weight red but not stringy like journal guard which is also red



Stoker Hydrostatic Lubricator

- Drain condensation
- Fill with valve oil



Turbo Generator

- Two journals
- Check and fill with turbine journal oil

Turbine Journal Oil

30 weight red but not stringy like journal guard which is also red

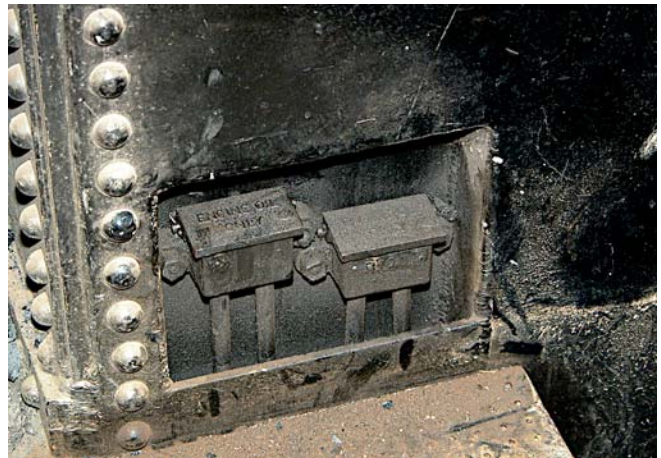


Firebox Door, Throttle, Stoker Drive, Power Reverse



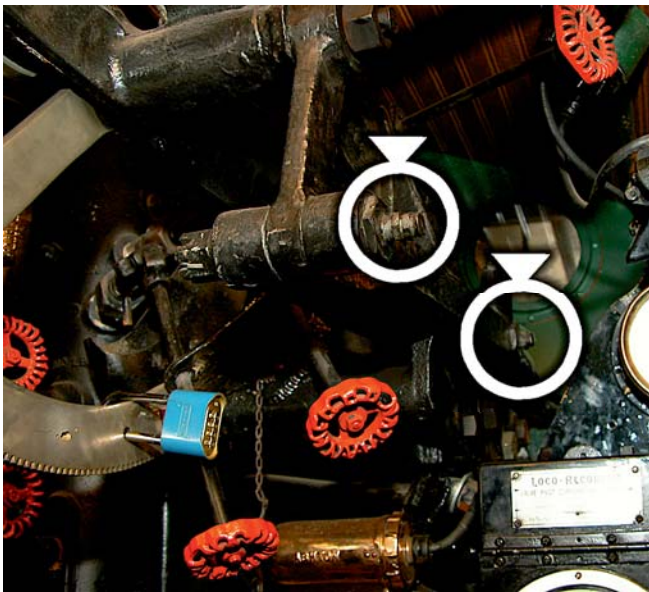
Firebox Door

- Oil air cylinder with valve oil
- Oil pivot at the top of the door with Journal Guard 1200



Stoker Drive

- Fill oil boxes on front fireman's side of the tender before departure and more often when heavily used.
- Use Journal Guard 1200



Throttle Inside Cab

- Two soft grease fittings



Power Reverse Drip Oiler

- Fill with compressor oil



Types of Oil & Grease

The 765 uses many different types of oil and grease, each for a specific application. It's important to use the correct lubricant to avoid potential mechanical problems or premature failure.

Each lubricant we use is described so that you can properly identify them and know where to use them. Also included are the components where each lubricant is commonly used. Refer to this manual for complete details.

Commonly used for:

Mechanical lubricator (fireman's side), Oil cups on trailing and tender truck

Journal Guard 1200
Red oil and tacky

Commonly used for:

Air compressors (steam side), Hydrostatic lubricators, Mechanical lubricator (engineer's side)

Valve Oil
Thick black to green oil

Commonly used for:

Air compressors (air side), Power reverse

Air / Compressor Oil
Thin yellow color

Commonly used for:

Cold water pump, turbo generator

Turbine Oil
30 weight, red color but not the same oil as Journal Guard

Commonly used for:

Stoker crankcase

Stoker Crankcase Oil
30w dark yellow color

Hard Grease

Commonly used for:

Rod bearings



Soft Grease

Commonly used for:

Rods, Valve gear, Valve crosshead, Various linkages, Brake hangers



Packing Grease

Commonly used for:

Lubricating the moving parts on blow down valves. The grease gun is the same as soft grease, but packing grease is a different compound.



Electrical Panel

Voltage

These meters display the voltage output of each of the three generators and the batteries.

Amperage

These meters display the current draw or load that's on each generator. The maximum allowed is marked on each gauge.

Circuit Breakers

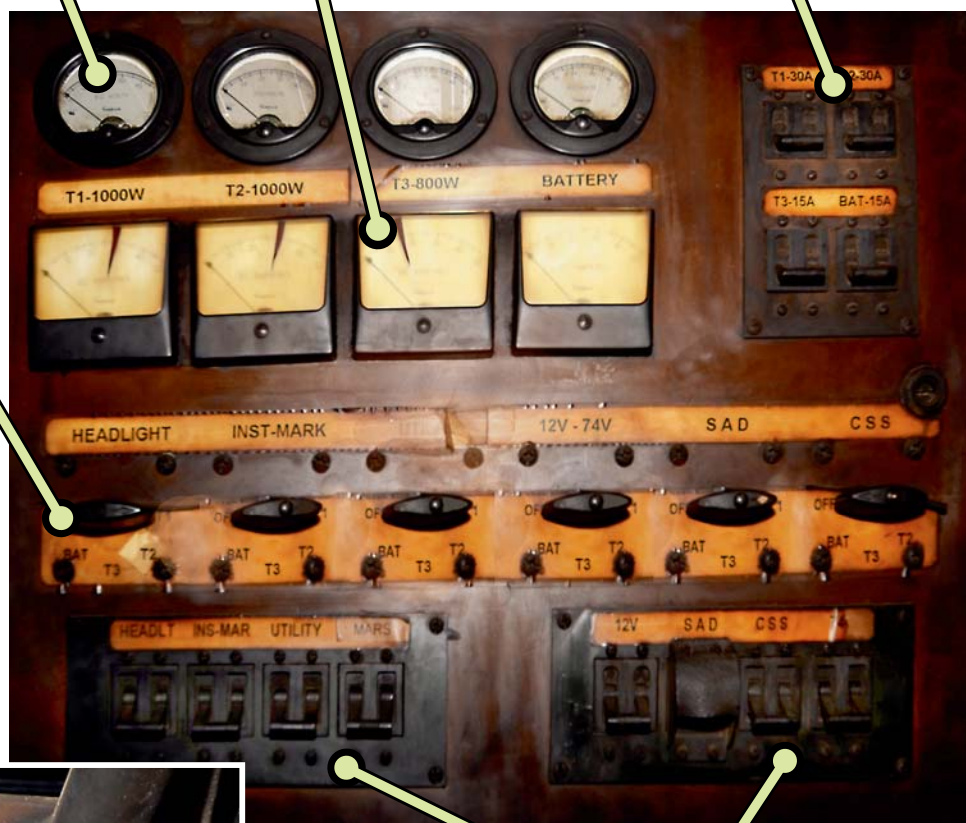
These are the main circuit breakers for each generator and also one for the batteries.

Device Switches

These switches allow the electrical load to be balanced by assigning devices to a specific electrical source.

Switches on Side of Panel

These switches control a cooling fan and power inverters. They should be left in the "ON" position



Circuit Breakers

Each device has its own circuit breaker which allows power to flow to that device. The device may also have an on/off switch.

