

480 Volt HEP

Switching procedure

Transitioning from Shore Power to Generator & Transitioning from Generator to Shore Power



⚠ DANGER

To prevent the risk of severe or fatal electrical shock, special precautions must be taken.

Introduction

The following instructions will show you how to transition the electrical system of a train from “Shore Power” to “Generator Power”, and how to transition from “Generator Power” to “Shore Power”.

These instructions are intended for Conductors (242 qualified), Conductor Trainees, Engineers (240 qualified), and Engineer Trainees (Firemen).

There are four basic steps:

- Preheating the Generator
- Switching from Shore Power to Generator Power
- Switching from Generator Power to Shore Power
- Shutting Down the Generator

Equipment required:

- Leather work gloves
- Pen or pencil
- Paper, to note fuel readings and engine hours



Do not handle 480 volt connectors with your bare hands. Always use insulated gloves (leather work gloves or equal).

These instructions also include additional information on the Shore Power electrical system (Wayside HEP Power Enclosure) and the Generator Car (the NVR 480R).

Preheating the Generator

Boxcar #480, Exterior

1. Open both exterior doors, and latch (or tie) open.
2. Check that all exterior panels are closed, and no mechanics are servicing equipment.
3. Record fuel readings (bottom diesel tank, under boxcar).

Boxcar #480, Generator Room

1. Turn on overhead lights in generator car.
2. Verify that main generator circuit breaker is closed (Up ON).

If main generator circuit breaker is open (Down OFF)—Do not attempt to start generator. Contact the Mechanical Department. The main generator circuit breaker can be closed ONLY by the Mechanical Department or with the express permission of the Mechanical Department.

3. Record engine hours.
4. Verify main switch (Center OFF).
5. Verify engine speed switch (Down LOW).
6. Verify battery switch (Right OFF), and panel light is off.
7. Close switch on auxiliary fan (Clockwise HIGH).
8. Close battery switch (Left ON), verify that the panel light comes on.
9. Close main switch (Right Manual). [Engine Start]

Observing Generator Start and Low Idle

Preheat light should illuminate for approximately 1/2 second, then engine should crank. Engine should “catch” within 1-1/2 seconds, then low idle. If ambient temperature is less than 40°F, “Pre-heat” might last up to 2 seconds and engine crank might last up to 3 seconds.

If engine cranks, but does not “catch”—Open main switch (Center OFF), and check “E-Stop”.

Oil pressure gauge should indicate 5 psi (or more) within 3~5 seconds.

If oil pressure shows no increase after 5 seconds, shut the unit down (open the main switch (Center OFF) and open the battery switch (Right OFF)—and contact the Mechanical Department.

Oil pressure gauge should indicate 25 psi (or more) within 10~15 seconds.

Oil pressure gauge should indicate 50 psi (or more) within 30 seconds.

Oil pressure should stabilize at 65psi.

If oil pressure does not stabilize above 50 psi, shut the unit down (open the main switch (Center OFF) and open the battery switch (Right OFF)—and contact the Mechanical Department.

At low idle, voltmeter should indicate 150~250 volts.

Watch the gauges for 15~30 seconds, to confirm a stable low idle condition.

Note:

Latch open exterior doors and turn on the auxiliary fan each time the generator is used. Increased air flow is not only for hot weather and wet weather conditions.

Switching from Shore Power to Generator Power

Wayside HEP Power Enclosure (After a 15 minute warm up)

1. Open shore power switch (Red button OFF)
2. Verify that shore power is off:
 - a. Power indicator on Wayside HEP Power Enclosure extinguishes
 - b. Lights on train extinguish
 - c. Train equipment sounds stop
3. Unplug Jumper from train's power receptacle.
4. Move wood power box away from train.
5. Hang Jumper on hook.
6. Insert dummy-plug into train's power receptacle.
7. Verify that plug is fully inserted, and is held in place by power receptacle's tab.

Boxcar #480, Generator Room

1. Verify that overhead lights are off (no power)
2. Check that all exterior panels are closed, and no mechanics are servicing equipment.
3. Verify that engine is at low idle.
4. Verify that voltmeter indicates 150~250 volts.
5. Verify engine speed switch (Down LOW).
6. Close engine speed switch (Up HIGH).
7. Check that engine is at high idle.
8. Watch gauges stabilize.
9. Verify that voltmeter indicates 480 volts.
10. Close contactor (Top-button ON).
11. Verify that overhead lights are on (power).
12. Close and lock generator room hallway door.

Switching from Generator Power to Shore Power

Boxcar #480, Exterior

1. Record fuel readings (bottom diesel tank, under boxcar).
2. If this is the last train of the day: close north exterior door.
If this is NOT the last train of the day: keep north exterior door open.

Boxcar #480, Generator Room

1. Open contactor (Bottom-button OFF).
2. Verify that overhead lights are off (power).
3. Open engine speed switch (Down LOW).
4. Check that engine is at low idle.
5. Verify that voltmeter indicates 150~250 volts.

Wayside HEP Power Enclosure

1. Check that shore power is off:
 - a. Power indicator on HEP Power Enclosure extinguished
2. Check that train power is off:
 - a. Lights on train extinguished
 - b. Train equipment sounds stopped
3. Remove dummy-plug from train's power receptacle.
4. Place dummy-plug on top of HEP Power Enclosure.
5. Move wood power box into position
6. Insert Jumper into train's power receptacle.
7. Secure jumper with a cable O-ring.
8. Check that jumper is fully inserted, and is held in place by power receptacle's tab.
9. Close shore power switch (Green button ON)

Shutting Down the Generator

Boxcar #480, Generator Room (After a 5 minute cool down)

1. Open main switch (Center OFF).
2. Open battery switch (Right OFF), and verify panel light is off.
3. Verify engine speed switch (Down LOW)
4. If this is the last train of the day: close (and lock) south exterior door.
If this is NOT the last train of the day: keep south exterior door open.
5. If this is the last train of the day: Turn off overhead lights in generator car.
If this is NOT the last train of the day: keep overhead lights in generator car on.
6. If this is the last train of the day: close (and lock) generator room hallway door.
If this is NOT the last train of the day: keep generator room hallway door open.
7. Open switch on auxiliary fan (Counter-clockwise OFF).

480 West Elevation

North Exterior Door

South Exterior Door



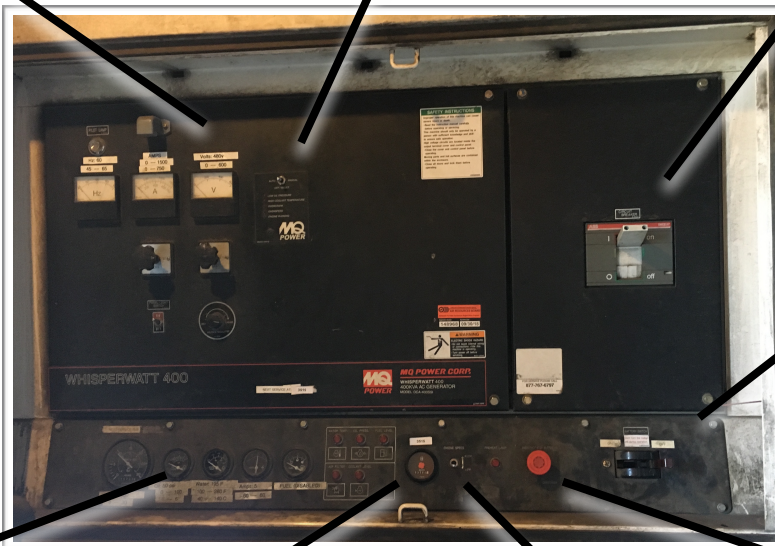
Bottom Diesel Tank

Main Control Panel

Voltmeter

Engine Speed Switch

Main Generator
Circuit Breaker



Battery Switch

Oil Pressure Gauge

Engine Hour Meter

Engine Speed Switch

"E-Stop"

Wayside HEP Power Enclosure (Connected)

Shore Power Switch & Power Indicator

Dummy-Plug

Jumper

Wood Power Box



Wayside HEP Power Enclosure (Disconnected)





Jumper (Correct)

Jumper is fully inserted, and is held in place by power receptacle's tab.

Jumper secured with a cable O-ring.



Jumper (Incorrect)

Jumper is fully inserted, and is held in place by power receptacle's tab.

Jumper **NOT** secured with a cable O-ring.



Jumper (Incorrect)

Jumper is **NOT** fully inserted, and is **NOT** held in place by power receptacle's tab.

Jumper **NOT** secured with a cable O-ring.



Cable O-Ring



Portable Control Loop Jumper



480V Receptacle

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