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MODEL P-SERIES LOCOMOTIVE AIR HORNS INSTALLATION AND MAINTENANCE INSTRUCTIONS

These following instructions are general and cannot possibly meet every contingency with regard to installation, operation or maintenance of the locomotive P horns. Please consult the Manufacturer, if further information is required or to deal with specific requirements.



WARNING: *Nathan Airchime air horn produces extreme loudness, which can cause permanent hearing damage. All personnel involved in the operation and maintenance of this equipment **must** wear hearing protectors when testing near horns. Permanent hearing loss will occur if testing near the horn without hearing protection.*

A. INSTALLATION

Horns should be installed as high as practical, free from obstruction, forward front hood.

All Model P-Series air horns have fixed diaphragm caps that require no adjustment.

All Model P-series horn will emit a clear sharp note without distortion, operating at any pressure from 30 to 150 psig (2 to 10 bars). However, the sound pressure level (loudness) will vary in relation to the pressure and air consumption. Therefore, for maximum loudness and efficiency, the operating pressure should be from 100 to 150 psig (8 to 10 bars). When operating at pressures below 50 psig (3.4 bar), the air horns are supplied with larger inlet orifices to maintain loudness at lower pressure. Therefore make sure that the stated working pressure of the air horn is in accordance with the pressure of the air system.

If sound intensity must be reduced to comply with new regulatory requirements, contact the factory for a proper size restrictor.

No special tools are required to install or maintain a Nathan Airchime air horns. Please refer to applicable assembly drawing for full details.

1. It is recommended that all horn assemblies be mounted on ½” Neoprene gasket (part number C-21075) to insure against the undesirable vibration to cab roof. Horn to be mounted clear of obstructions.
2. Air supply line should be one size larger than the inlet connection of the horn and it should rise continuously through well graded piping, free from pockets and long horizontal runs.
3. Air supply at the horn should be clean and dry, install separators, traps and strainers to maintain this.
4. Air supply should be taken from the top of the air tank or main supply line.
5. Use thread seal sparingly and on male thread only.
6. Avoid the use of elbows if possible. (General rule of thumb is 3-psig (0.2 bar) drop on 120 psig (8.2 bar) per pipe elbow). Long radius bends are less restrictive.
7. On extreme long runs, a buffer tank, located close to the horn, will compensate excessive pressure drop. Pressure drop at the horn, should not exceed 15 psig (1 bar), when blowing. Install test gauge at the horn inlet to check this when installing.
8. Install shut off valves where necessary to facilitate servicing.
9. Install operating valve close to horn for sharp concise blasts - Sound should not “trail off” at the completion of a signal.
10. Before connecting the horn and valve, blow out all lines thoroughly, tapping pipes with hammer to free loose scale and pipe chips.
11. Outside runs that are exposed to cold weather conditions should be well protected or consideration given to electric heating of the pipe.
12. Control valve should be rated for the weather type. Otherwise, it should be heated to prevent freezing.
13. When operate horn at lower pressure and extreme winter weather conditions, contact factory for upgrade of heated horns version to ensure reliability and public safety.

If the above procedures have been followed, the horn will sound loud and clear when the manual valve is pulled or the solenoid valve energized.

MULTI-TONE AIR HORNS

All diaphragm head assemblies are common on multi-tone models and are serviced as in maintenance.



WARNING: *A Nathan Airchime air horn produces extreme loudness, which can cause permanent ear damage. All personnel **must** wear hearing protectors when testing near horns. For multiple-tone models, while horn is sounding, place hand in front of each bell mouth to determine if all horns are functioning properly.*

For test purposes, all horns should be sounding at 15 to 20 psig (1 to 1.3 bar) and increase in loudness as the air is increased to maximum operating pressure.

ELECTRICALLY OPERATED AIR HORNS

1. Run power supply line from main source of junction to solenoid valve.
2. Confirm that the supply line voltage and solenoid voltage are the same.
3. Bring supply line into cap with standard approved fitting and allow for solder connection to coil leads.
4. Check solenoid coil and power supply line for continuity and short-circuit before switching main power supply “ON”.

CAUTION! *Wiring procedures and electrical installation must follow in accordance with prevailing electrical codes, at place and time of installation, subject to inspection approval.*

MANUALLY OPERATED AIR HORNS

1. Check lanyard for excessive slack.
2. Check return spring for proper tension.
3. Inspect valve plunger assembly for excessive wear or binding.
4. Check for debris chip lodged on diaphragm seat.

B. TROUBLESHOOTING

HORN STOPS BLOWING: Air is not getting to the horn or control valve. Solenoid valve coil is defective or applied voltage is incorrect. Manual valve plunger assembly is worn or stuck. Lanyard has excessive slack.

HORN SOUNDS RASPY AND DISTORTED: Cracked diaphragm discs. Debris chips lodged on diaphragm seat. Loose cap.

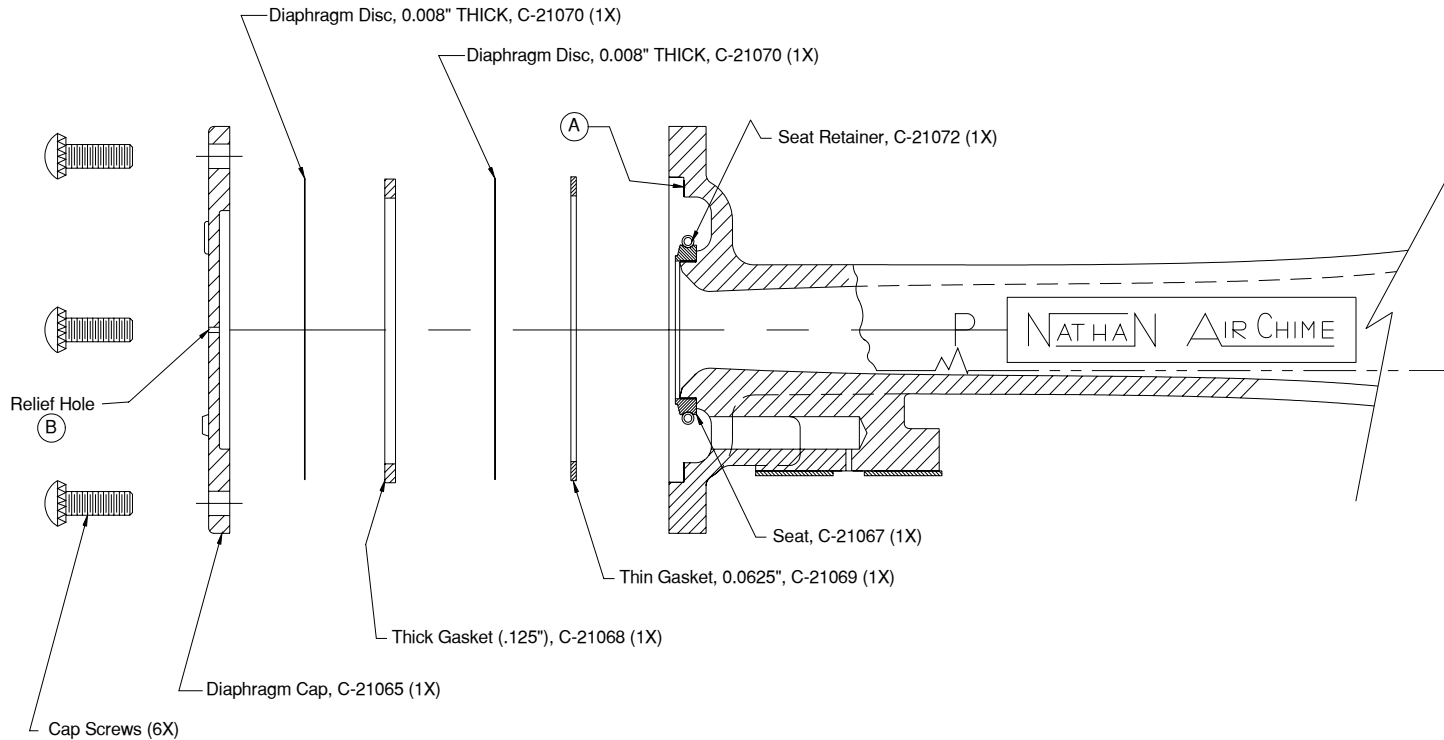
HORN HISSES WHEN BLOWN: Diaphragm discs warped and not seating properly. Excessive pressure. Diaphragm seat badly scored or scuffed.

CHANGE IN CHARACTER OF SOUND: Cracked diaphragm disc. Warped diaphragm disc. All horns are not blowing (Multi-tone models).

HORN FAILS TO SHUT OFF: Manual valve stuck on. Return spring broken. Debris chip lodged on diaphragm seat. Solenoid valve is frozen. Short-circuit in electrical supply.

Make any repairs to horn as outlined under maintenance.

C. MAINTENANCE



Diaphragm head components and their order of assembly are shown above. This is typical for all model P-Series Horns.

1. To dismantle, remove 6 screws, diaphragm cap, discard diaphragm discs 0.008", thin gasket 0.0625", thick gasket 0.125" and rubber seat but keep seat retainer (C-21072) for reuse.
2. Wipe off and inspect shoulder (A). Remove any particles that are lodged or imbedded. This should be done carefully without destroying the flatness or smooth surface of the seat faces. (If air system is not clean, seats can become badly scuffed or nicked and should be returned to factory for re-machining or replace with new bell body).
3. Replace parts from repair kit (WH-SA-61) in order shown above. Place the seat (C-21067) first with beveled edge faced toward diaphragm cap. Place seat retainer (C-21072) by stretching the spring and push it onto the seat, making sure that it properly seated.
4. Install new thin gasket 0.0625" (C-21069), new diaphragm disc 0.008" (C-21070), new thick gasket 0.125" (C-21068), and finally another new diaphragm disc 0.008" (C-21070).
5. Make certain that the relief hole (B) is clear and unrestricted. If plugged, the horn will stop sounding.
6. Assemble diaphragm cap and tighten 6 cap screws in star pattern by alternately tighten opposite screws a little at a time to bring diaphragm cap in evenly and snug.

D. Model P Series Locomotive Air Horns Maintenance Schedule

1. Horns are part of critical safety equipment on a locomotive. Under normal operating conditions, we recommend that routine maintenance on these horns to be done semi-annually. Inspection frequency should be shortened if horns are subjected to severe or dirty operating environment such as exhaust soot

or under carriage horn mounting. Diaphragm disc assembly which is an integral part of sounding mechanism should be replaced systematically at least every two years in service regardless frequency of usage (use kit number WH-SA-61).

2. In addition to annual maintenance, periodic inspection must be done when the train operator observes any change in tonal characteristics, reduction of sound intensity or any irregularity of system functionality.
3. For proper maintenance, each bell on a horn cluster should be visually inspected. Diaphragm head assembly (horn sounding mechanism) should be checked and cleaned thoroughly. Worn or broken parts (diaphragm discs or gaskets) must be replaced with factory parts. Sounding test should be done after the servicing to ensure system integrity by feeling the vibration with hand at each bell mouth when blowing the horns.



WARNING: Wear proper hearing protection when conducting horn tests. Hearing loss or permanent damage may result from unsafe use.

4. We strongly recommend that a regulatory compliance test should be done each time horn maintenance, repair or service is performed using a sound level meter to check for conformance.

Contact us if you need further help:

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