



Types of Tunnel Equipment

Objectives

To review the types of equipment that would need to be maintained in a tunnel car wash and the safety issues of which to be aware while working around tunnel equipment.

Content

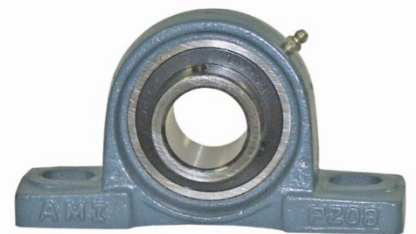
A. Mechanical Equipment

Throughout the tunnel there are various pieces of equipment that will require preventive maintenance.

1. Bearings

a. Metal Pillow Block Bearings:

- 1) They are bearings that mount with the shafts **perpendicular.** to the mounting bolts.
- 2) They are used as hinge points or rotational points on:
 - a) Tire brushes
 - b) Arms for wraps
 - c) Arms for side brushes
 - d) Tire shiners
 - e) Conveyors
- 3) These bearings require frequent lubrication, which not only makes the equipment operate smoothly, but also assists in keeping water out of the bearing.
- 4) A standard marine grease can be used in these bearings. Be careful not to over grease! One to two pumps are sufficient or until you feel back pressure. If grease comes out of the top of the bearing, the seal has been broken and water and dirt can then penetrate the bearing and it will fail sooner.





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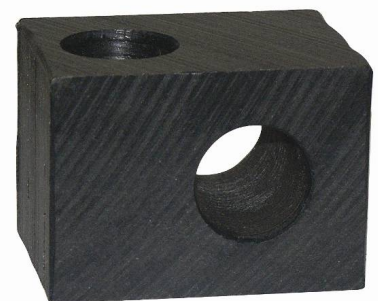
b. Metal Flange Bearings:

- 1) These are bearings that mount with the shafts **parallel.** to the mounting bolts.
- 2) They are used as rotational points on:
 - a) Brush shafts
 - b) Wrap shafts
 - c) Motor shafts
 - d) Central vacuum systems
- 3) They require frequent lubrication, which not only makes the equipment operate smoothly, but assists in keeping water out of the bearing.
- 4) A standard marine grease can be used in these bearings. Be careful not to over grease! One to two pumps is sufficient or until you feel back pressure. If grease comes out of the top of the bearing, the seal has been broken and water and dirt can then penetrate the bearing and it will fail sooner.



c. Greaseless Plastic Bearings:

- 1) These bearings are constructed of Ultra-High Molecular Weight (UHMW) plastic.
- 2) **They have no moving parts.**
- 3) They can be either a flange or a pillow block configuration.
- 4) They are used on the mitters, top brushes, Pendulums and Omni s.
- 5) No lubrication is required, in most instances, but they should be inspected regularly for wear.





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2. Couplers

a. Split Collar:

- 1) These collars are used to join a hollow shaft to a solid shaft.
- 2) They are used on all the **brushes and wraps.**
- 3) No lubrication is required, but anti-seize should be used when assembling.
- 4) Filling screw heads with clear silicone during installation will allow for easier removal at the next service date.



b. Delrin Couplers:

- 1) This coupler is used to join two solid shafts end to end.
- 2) It is used on older style mitters to connect the motor to the gear reducer.
- 3) **They are designed to break before allowing serious damage.**
- 4) No lubrication is required, but they should be inspected regularly for wear.



c. Duraflex Coupler:

- 1) These are used to join two solid shafts end to end.
- 2) They are used on central vacuum systems to connect the **motor to the turbine.**
- 3) No lubrication is required.





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Belts and Pulleys:

- 4) These are not normally thought of as a coupler, but are probably the most common of all.
- 5) They are used on high pressure water pumps and **air compressors.**
- 6) No lubrication is required, but they should be inspected regularly for cracking and stretching.
- 7) If belts show signs of wear, they should be replaced as a set.



d. Chains and Rollers:

- 1) **This is the most important coupler in a car wash tunnel.**
- 2) They are used to connect the conveyor system to the actual vehicle.
- 3) They must be checked daily for stretching. If the chain is allowed to become slack it will jam and put the car wash down at the most inopportune time.





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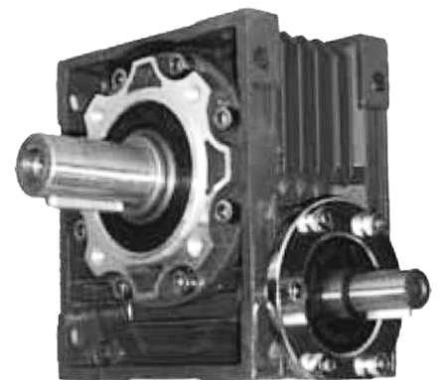
3. Shocks (spring-loaded or gas charged)

- a. These are used to cushion impact and **to apply constant pressure.**
- b. They are used on:
 - 1) Wrap and brush arms
 - 2) Tire brush assemblies
 - 3)
 - 4) Conveyor take-up assemblies
- c. No lubrication is required, but they should be replaced at the first signs of failure.



4. Gear Reducer

- a. These are used to reduce shaft rotation speeds and increase usable torque.
- b. **They are used on mitters or any electric equipment.**
- c. They should be inspected regularly for leaks and gear oil must be changed to prevent early failure.





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B. Hydraulic Equipment

1. Hydraulic Power Packs

- a. These are used to provide **power in the form of pressurized oil** to various pieces of equipment in the tunnel.
- b. One large power pack with a flow divider may be used to drive all the equipment in the tunnel.
- c. Several smaller power packs may be used to power individual pieces throughout the tunnel.
- d. They should be inspected daily for leaks. A leak here could become a huge mess in the equipment room very quickly. If a hose bursts, it could put the car wash down in the middle of heavy business.
- e. There are two ways to plumb a component from a power pack:

In series

In parallel



2. Hydraulic Motors

- a. These are used to convert the pressurized oil provided by the power packs into **rotational motion.**
- b. They are used on any hydraulically driven component in the car wash (conveyor, tire brushes, etc.)
- c. They should be inspected daily for leaks. A leak here could end up on the customers' vehicles.





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3. Hydraulic Hoses

- a. These are used to **deliver** the pressurized oil from power packs to the hydraulic motors in the tunnel.
- b. They should be inspected on a daily basis for leaks and chaffing.
- c. A burst hose in the equipment room will put you down and create a mess, but one in the tunnel will drench your brushes with oil and could put you down for days.



C. Electrical Equipment

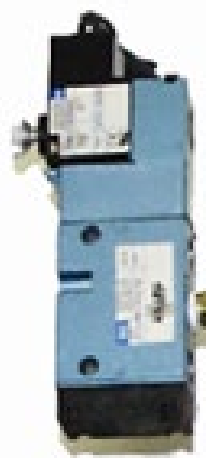
1. Electric Motors

- a. These motors are used on all electrically driven components in the tunnel. (wraps, side washers, etc.)
- b. Some require lubrication, but most have **sealed bearings**.
If lubrication is required, it is mandatory to use a high temp, electric motor grease.
- c. They should be checked regularly for corrosion and water intrusion.
- d. The drain plugs should be checked to ensure proper installation.



2. Solenoids

- a. These are used to control water, air, or chemical flow.
- b. They should be checked for corrosion and water intrusion.
- c. There will be several solenoids, both liquid and air, in your backroom.





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3. Sensors

- a. Several different types are used throughout the car wash.
 - 1) Light beam sensors (photo electric eyes) are used to measure vehicle length.
 - 2) Pressure pads (tape switch) are used to locate tire position.
 - 3) Induction loop pads, underground and surface-mounted, are used to detect a vehicle passing over it.
 - 4) Low level switches are used to detect levels in water tanks and oil reservoirs.
 - 5) Magnetic switches are used to detect roller position or conveyor speed.
- b. Some sensors need to be cleaned routinely, but otherwise not a lot of regular maintenance is required.
- c. Because most sensors are relatively inexpensive, it would be advisable to keep replacements on hand for items that would put the wash down if they failed.



4. Computer Control System and Motor Control Center

- a. These items are obviously very important to the wash, as they are the brain and spinal column of the car wash tunnel.



License Plate Recognition



Mobile POS



Controller Retrofit Kit



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Troubleshooting of the computer control system by on-site personnel is very limited, unless they have extensive knowledge of the equipment. However, with factory assistance over the telephone, most problems can be isolated and plug-in replacement parts can be shipped.

- b. Troubleshooting and repair of the motor control center, where three phase power is present, should be left to a licensed electrician



D. Plumbing

1. There is a lot of plumbing in a car wash tunnel. The following are some examples.

- a. Low pressure water lines .
- b. High pressure water lines .
- c. High pressure hydraulic fluid lines .
- d. Gas lines .
- e. Reclaim and wastewater lines .
- f. Compressed air lines .

2. In the Equipment Repair program, we cover some general repairs of some of these lines, but more complex repairs should be left to licensed tradesmen.



WARNING *SAFETY REQUIREMENTS* WARNING

1. All employees must be thoroughly trained in safe operation and standard maintenance practices. All employees must review this entire manual monthly.
2. Do not enter the wash tunnel when the equipment is operating. Death or dismemberment may occur.
3. Do not wear loose fitting clothing or jewelry around moving equipment. Do not allow any part of your body or other objects (including ladders, hoses or tools) to come in contact with moving equipment. Entanglement may result causing death or dismemberment.
4. Do not leave a ladder or any other items such as wash down hoses or tools in the wash tunnel while equipment is running. Vehicle damage and injury, including death, can occur.
5. Always exercise caution when walking (never run) through the wash tunnel as there may be slippery conditions. Be careful so you do not bump into or trip over equipment.
6. Only those employees specifically instructed and trained by the location management are permitted to enter the wash tunnel to perform inspections or maintenance. At least two qualified maintenance people must be present when performing equipment repairs or preventive maintenance.
7. Do not perform any maintenance or work on equipment unless you first perform Lock-Out Safety Precautions. All electrically powered equipment must have manually operated disconnects capable of being locked in the "OFF" position. Equipment that has been "locked out" for any reason must be restarted only by the person who performed the "lock out" operation.
8. When working on any equipment that is higher than your shoulders, always use a fiberglass ladder that is in good condition.
9. Do not attempt to repair or adjust any pressurized liquid or pneumatic part, hose, pipe or fitting while that equipment is in operation.
10. Electrical connections and repairs must be performed by a Licensed Electrician Only.
11. Emergency "STOP" buttons must be well marked and their location and proper use reviewed with all personnel. Any activated "STOP" button must be reset only by the person who activated it. Clear the wash tunnel of any people, ladders, hoses, tools and other loose items before restarting the equipment. An audible device must sound to warn people that the equipment is starting.
12. Do not operate any piece of equipment that requires safety covers with those covers removed or improperly installed. Do not operate any piece of equipment if any component of that piece is suspected to be defective or malfunctioning.
13. Store all cleaning and washing solutions and oils in a well-ventilated area. Clean up fluid spills immediately to prevent hazardous safety conditions. Be certain to follow all safety procedures on SDS Sheets for each chemical product used.



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14. All hydraulic and electric systems in the wash tunnel equipped with a torque relief or overload should be checked and set at the minimum amount that will allow for proper functionality under normal washing conditions.
15. No unauthorized people should ever be permitted in the wash tunnel or near the equipment at any time.

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!! CAUTION !!

When a piece of equipment must be in operation during inspection or maintenance, one qualified technician must stay at the power disconnect switch while another qualified technician performs the inspection or maintenance.