# Air Dryer Addendum

# AIR DRYER

The air dryer is located underneath the motorhome next to the transmission. The air dryer removes moisture from the compressed air system. This is important because if air contains moisture it can freeze and prevent operation of brakes or other pneumatic operated items.

The air dryer has three functions: cooling, filtering and drying the air going through the motorhome's air system. If an excessive amount of water is present when performing the monthly air tank drain service, it may be an indication that the filter for the air dryer needs to be changed.

## *Air Dryer Operation*

During system pressure build-up compressed air passes into the air dryer where the filter system removes contaminants and passes the air into the drying stage.

Initially, moisture that condenses out collects in the base of the dryer. Moisture-laden air passes through the desiccant bed in the air dryer cartridge and is dried. When the compressor unloads, the water is expelled and the dry air flows back through the dryer, drying the desiccant for the next cycle.

## *Air Dryer Cycle*

The governor turns the compressor on when supply tank pressure drops below cut-in pressure. Compressed air passes into the air dryer at the inlet port:

- Moisture-laden air and contaminants pass through the desiccant.
- Moisture is retained by the desiccant. Moisture also collects in the base of the dryer.

When the compressor unloads the purge valve opens. The governor turns the compressor off when system reaches cutout pressure (approximately 120 psi).

- The dryer purges and expels water collected in the dryer base.
- When the regeneration valve opens, the dry system air flows back through the dryer. A small charge of air from the front tank backflows through the filter. The backflow dries the desiccant, preparing it for the next cycle.

## *Importance of the Air Dryer*

1. When air is compressed, the compressor takes in water vapor with the air, compresses the water vapor and puts it into the system as liquid water.
2. Liquid water that accumulates in air lines can damage seals and valves, and wash away lubricants.
3. In cold weather water can freeze, block air lines and damage air system components.

## *Desiccant-Type Air Dryer*

1. Warm, humid air from the compressor condenses into either liquid water or water vapor before entering the air dryer.
2. A desiccant-type air dryer protects the motorhome air brake system by drying moisture-laden air before it passes through the air reservoirs and into the brake system.
3. Water collects in the base of the dryer when:
   - Warm air condenses into water before it enters the dryer.
   - Warm air condenses into water inside of the dryer before the water reaches the desiccant.
4. The desiccant material then removes additional water vapor, further drying the air.
5. During the regeneration phase, the regeneration valve and pressure-controlled check valve remove water from the deiccant bed with a backflow of dried, expanded system air.

## AIR DRYER COMPONENTS

**1. Purge Valve:**
A valve located on the bottom of the air dryer base that remains open during a compressor unload cycle. The purge valve allows collected moisture, condensation and contamination to be expelled from the air dryer during a purge cycle.

**2. Pressure Relief Valve:**
A valve that protects the air dryer from over-pressurization.

**3. Regeneration Valve:**
The valve that controls regeneration of the desiccant. The regeneration valve allows air from the supply and secondary tanks to bypass the outlet check valve. The air expands and backflushes moisture off the desiccant through the dryer's purge valve.

**Extreme Cold:**

Make sure the air dryer heater is in good working order. The heater in the air dryer is a 100-watt heater controlled by ignition power and turned off when the ignition is switched off. Thermostat operating range is On below 45° F and Off when the temp is above 86° F. The fuse is located in the front electric bay outside, beneath the drivers window.

**WARNING: Remove all pressure from the air system before disconnecting any component, including the desiccant cartridge. Pressurized air can cause serious personal injury.**

## *Desiccant Cartridge*

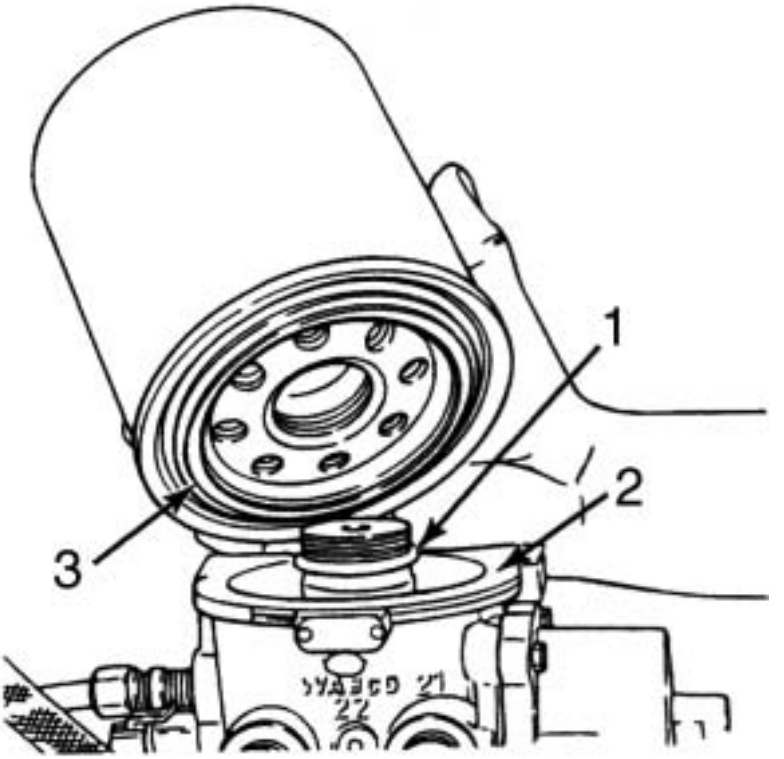
1. Replacement kit contains one cartridge and one O-ring.
2. Loosen and remove the old cartridge. Use strap wrench, if necessary.
3. Remove and discard O-ring from dryer base.
4. Inspect and clean seal seat. Repair any minor damage.

**NOTE: If the seats are damaged so badly that a tight seal cannot be maintained, replace the air dryer.**

5. Lubricate O-Ring on stem with a thin layer of grease.
6. Lubricate cartridge seal with a thin layer of grease.
7. Thread the replacement cartridge onto the base until the seal touches the base. Tighten the cartridge **ONE** additional turn. **DO NOT OVERTIGHTEN.**


*Filter.*

| REPLACEMENT REQUIREMENTS | | |
|---|---|---|
| **Components** | **When to replace** | **Why** |
| Desiccant Cartridge | Every two to three years.<br>When compressor is replaced.<br>Water in supply tank. | Preventive maintenance.<br>Contaminated cartridge.<br>Saturated or contaminated cartridge, high duty cycle (wrong application of air dryer). |




**1. O-RING**
**2. SEAL SEAT**
**3. SEAL**