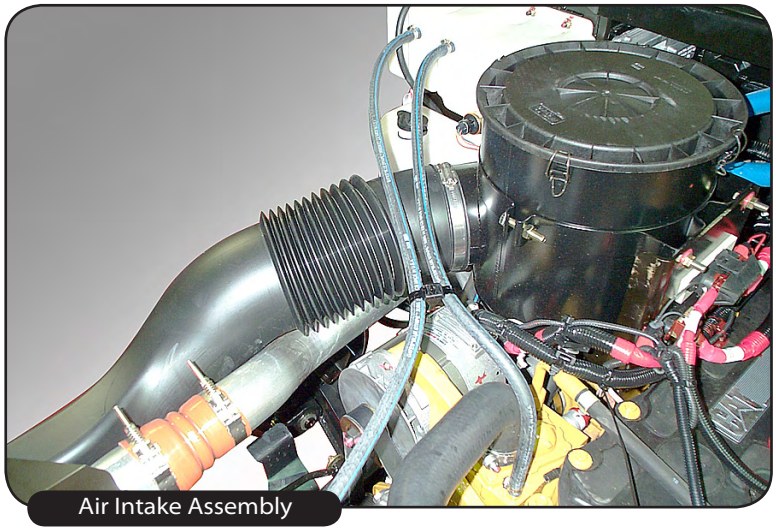
Air Intake Assembly

Clean air is necessary for efficient fuel combustion and for normal engine life. If allowed to enter the engine, airborne contaminants combine with engine oil to form an abrasive compound which may drastically shorten engine life.

The Blue Bird Vision's engine's air intake system consists of an engine-mounted filter, its associated ductwork, mounting hardware, and fittings. The dry-type filter element is easily accessible for replacement without tools, and without removal of any other chassis components or brackets.

A restriction indicator provides a visual alert in the case of obstruction restriction of the air filter and intake duct screen.

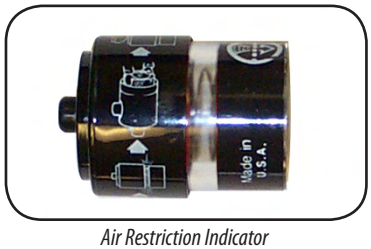
Fresh air enters the intake system through a grill mounted on the right side of the radiator at the front of the engine compartment, proceeds to the filter assembly and passes through the filter element, which traps airborne dirt, dust and other foreign particles.



Air Intake Assembly

Air Restriction Indicator

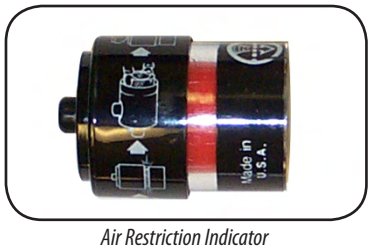
The Air Restriction Indicator is mounted on the underside of the air cleaner housing, and is visible from the right side of the bus when the engine compartment hood is raised. During engine operation, the indicator monitors vaccuum pressure inside the air filter elbow. As vaccuum increases, the indicator's red piston becomes visible through the clear portion of the housing indicating that air flow is being restricted by a clogged filter, debris, or other obstruction. The Air Restriction Indicator is variable until the monitored vaccuum increases to a measure of 25 inches H_2O. At that measure, the red piston fills the clear portion, and locks in its position. The indicator must then be manually reset by pressing the reset button after the restrictive condition has been corrected.



Air Restriction Indicator

Normal reading. Some fluctuation while the engine is running is acceptable.

The Air Restriction Indicator activates only when an air flow restriction has occured. A normal reading (no red showing) must not be misunderstood as an indication that the air filter is clean, and does not preclude the need for other inspection and maintenance. For example, a leak in the intake will allow damaging debris to enter, but will not be indicated by the Air Restriction Indicator.



Air Restriction Indicator

At a vaccuum of 25 inches H_2O, the red piston locks, indicating that the air intake tract is too restricted.

Filter restriction and proper operation of the indicator may be verified by pressing the reset button on the bottom of the indicator. If restriction is occurring, the red indictor will move when the engine is under load. The indicator will lock in position if the monitored vaccuum increases to 25 inches H_2O.

It is important to understand that the Air Restriction Indicator does not detect leaks, and will not properly indicate restrictions in a leaking system. Check for leaks in all inlet hoses, tubes and connections. If a leak is found, correct it immediately, using original replacement parts and torqing all clamps.

The Air Restriction Indicator can also be tested using a calibrated vacuum gauge and vacuum pump. Check the full range of the indicator, and verify that the red indicator locks into position at 25 inches H_2O. The Air Restriction Indicator is not repairable, and should be replaced if found to be operating incorrectly.

Intake System Maintenance

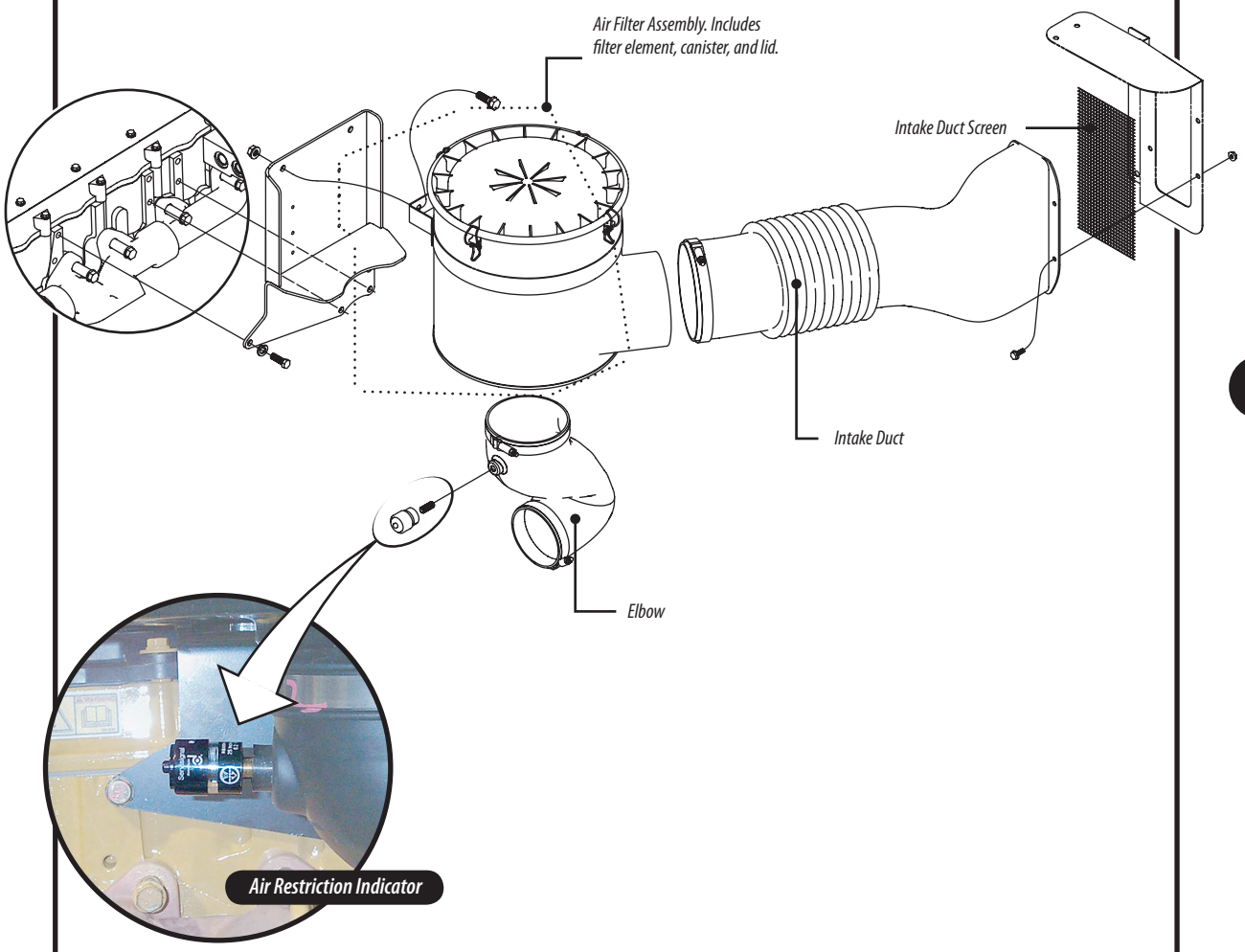
Although it is a simple system, dilligent maintenance and inspection of the air intake tract is critical. Never run the engine with the air cleaner or its filter element removed. Use only original replacement parts to avoid poor fit and consequent air leakage.

The intake system inspection and maintenance intervals indicated below are guidelines which assume normal operating conditions. Appropriate service intervals vary according to operating conditions. In dusty or high humidity environments, more frequent service may be required.

Recommended Intake System Maintenance

OPERATION	Interval: Months/Miles whichever occurs first — Daily	3 / 5,000	12 months	NOTES
Air Restriction Indicator				
Check	•			*Replace air filter element if indicator is red. (Indicator locks at 25 inches H_2O.)*
Test			•	*Test Air Restriction Indicator with a vaccuum gauge and pump.*
Air Cleaner Element				
Inspect		•		*Inspect visually. Must be properly seated. Lid must be secure. Replace if soiled, wet, or damaged.*
Replace			•	*Also replace if Restriction Indicator is red. Replace more frequently if needed.*
Ducts & Mountings				
Inspect duct & elbow	•			*Visual inspection. Replace damaged parts immediately.*
Inspect duct & elbow		•		*Thorough inspection. Replace any damaged parts.*
Inspect support bracket		•		*Visual inspection. Replace damaged parts immediately.*
Inspect Charged Air Cooler Piping		•		*Inspect for evidence of contaminate infiltration, loose clamps, wear spots, holes in piping.*
Fasteners				
Inspect all fasteners		•		*Visual inspection. Tighen loose fasteners.*
Tighten spring-loaded clamps		•		*Tighten to near full spring compression.*
Tighten T-bolt clamps		•		*50 in. lbs. (5.6 Nm)*
Tighten worm gear clamps		•		*38–42 in. lbs. (4.2–4.7 Nm)*
Tighten hose clamps		•		*10 in. lbs. (1.1 Nm)*

Air Intake System



General Inspection

Under normal operating conditions, inspect the Air Restriction Indicator daily (more frequently in dusty high humidity conditions). Inspect the air intake system every 3 months or 5000 miles. Inspect the system for:

- Air Restriction Indicator. If red indicator is visible, replace the air cleaner element, and check the system for debris and other restrictions.
- Clamps. Tighten loose clamps and check for proper fit and seal. Replace if corroded, broken or otherwise damaged.
- Ducts and piping. Inspect for wear, damage, or abrasion.
- Air cleaner element. Replace if soiled, wet, torn, or otherwise damaged. Ensure proper installation and seal.
- Mounting brackets. Check for loose or damaged mounts.
- Charged air system piping. Tighten loose clamps. Check for wear spots and holes in the piping.
- Air compressor inlet lines. Tighten. Check for wear or other damage.

Clamps should be tightened to the following specifications:

Spring-loaded clamps. ***Tighten to near full spring compression.***

T-Bolt clamps. ***Tighten to 50 in. lbs. (5.6 Nm).***

Worm gear clamps. ***Tighten to 38–42 in. lbs. (4.2–4.7 Nm).***

Hose clamps already in service. ***Tighten to 10 in. lbs. (1.1 Nm).***

Air Filter Element Replacement

Replace the air filter element at least once a year, and whenever the Air Restriction Indicator has been activated (shows red). Other indicators of a dirty air cleaner element include loss of power or excessive exhaust smoke. To replace the air cleaner element:

Air Cleaner Element

Unlatch the four clips and lift off the lid.

1. Unlatch the four quick release latch clamps holding the lid to the top of the air filter housing.

2. Remove the lid to expose the air cleaner element.

3. Lift the air cleaner element straight upward. A rotating or rocking motion may help unseat the element.

4. Before replacing the element, inspect all clamps, hoses, piping and seals.

   - Inspect inside the intake elbow for signs of dust or debris finding its way into the system through leaks. Replace any damaged components allowing the leak, and clean the debris inside the elbow and ducts before installing a new element.

   - If evidence of leaks is found, check the tube between the charged air cooler and the engine intake for contamination. If contamination is found, the charged air cooler should be replaced.

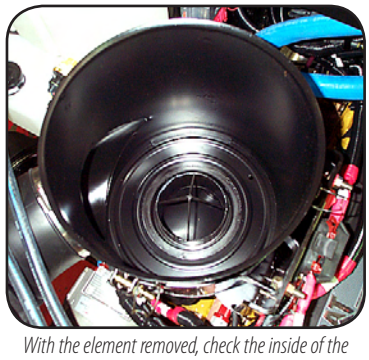
5. Install a new air cleaner element, fully seating its bottom seal.

6. Assemble removed parts in reverse order of disassembly.

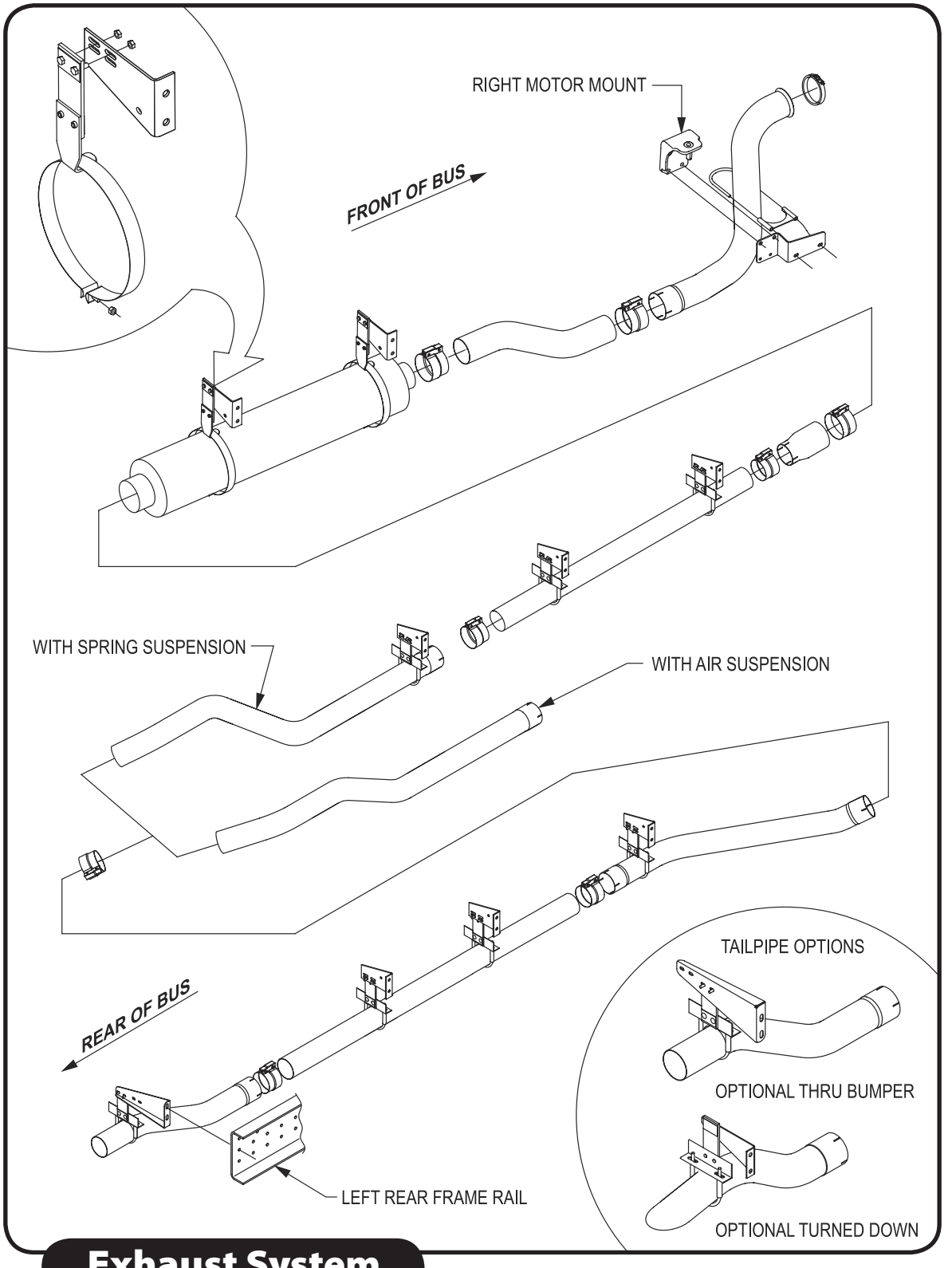
7. Replace the filter housing top. Ensure it is properly seated, and secure with the four quick release clamps. If necessary, a clamp's tension may be tightened by using pliers to carefully shorten its curve.

8. Reset the Air Restriction Indicator by pushing the reset button. This will allow the indicator to monitor the newly installed components.

The element fits snuggly around its bottom seal. A gentle rocking or rotating motion will help unseat it.



With the element removed, check the inside of the elbow for any sign of contamination due to leaks.



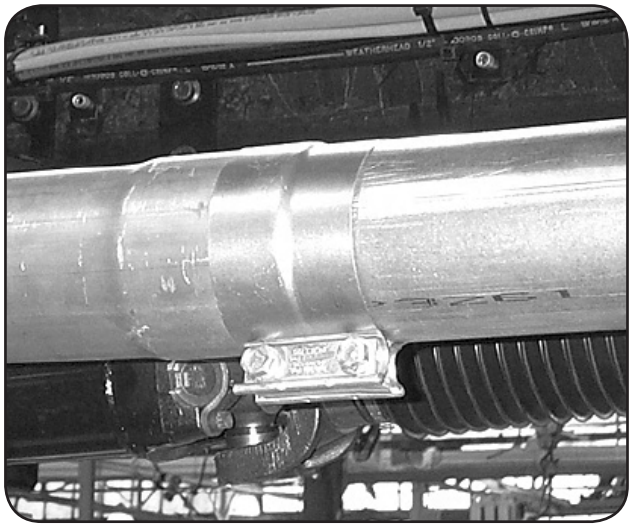
Exhaust System

Exhaust Assembly

The exhaust system is designed to move hot exhaust gases from the engine, underneath and toward the rear of the bus, while preventing contamination of the passenger area. Note that it is important to maintain the exhaust system to ensure no gases are allowed to escape before they are intended to. All pipes and connections must be inspected at least monthly to provide continued safe transport of passengers.

Never work under a bus with the motor running. Never work under a bus until the wheels are chocked, to prevent movement in either direction.

The wheelbase of the unit will determine the length of the exhaust pipe and tailpipe sections. Nonetheless, they are assembled in the same way, regardless of the length of the section. As a general rule, to remove the exhaust system, or any part of it, start at the rear most hanger and work forward.



Typical Exhaust Clamp

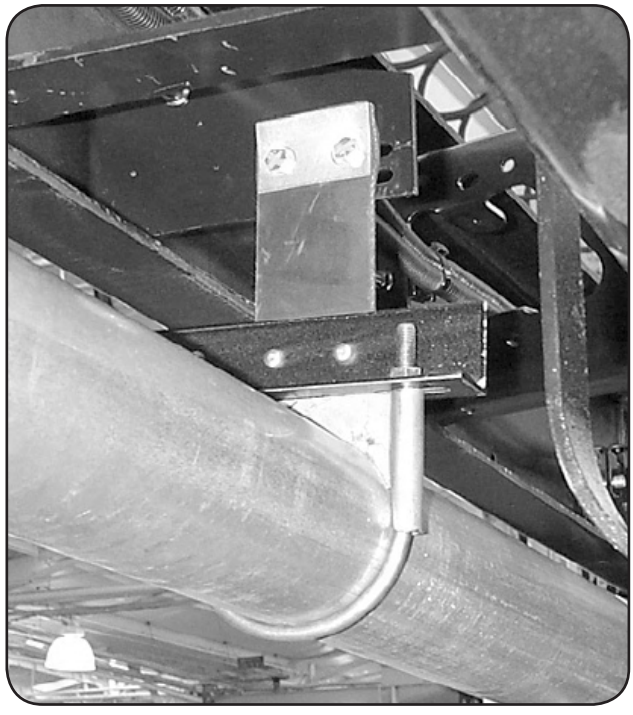
Muffler Removal

This section of the system is the same on all wheelbases.

1. Start at the rear bumper and loosen all the sections forward until you reach the muffler.
2. Remove the wideband clamp securing the tailpipe onto the muffler.
3. With the slack produced by loosening the section clamps rearward, remove the tailpipe section nearest the muffler.
4. Loosen the nuts at the straps securing the muffler.
5. Support the muffler and remove the strap from the hanger.

If it is necessary to continue removing exhaust pipe sections, proceed from the muffler toward the engine as far as necessary.

Typical Exhaust Hanger



Muffler Reinstallation

When assembling the exhaust system, start at the forward most section and work toward the rear of the bus. Always use new wideband clamps and hardware.

1. Assemble the exhaust pipe to the muffler. Leave all connectors loose for final adjustment.

2. Ensure the pipe joints overlap 2 inches or more.

3. Using new wideband clamps and hardware, torque to 40–60 Ft lb (54.23–67.80 Nm).

4. Torque the strap holding the muffler to 18–20 ft lb (24.40–27.12 Nm).

5. Continue toward the rear of the vehicle in the same manner. Leave all joints loose until the entire tailpipe assembly is in the correct position, and then torque the clamps to 40–60 ft lb (54.23–67.80 Nm).