

# Exhaust System



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# Exhaust System

## Safety

The purpose of this safety summary is twofold. First, it is to help ensure the safety and health of individuals performing service on, or operation of, this Blue Bird product. Second, it is to help protect equipment. Before performing any service or operating procedure on this product, individuals should read and adhere to the applicable warnings, cautions and notes located throughout this Blue Bird Service Manual.

## Warnings

Warnings apply to a procedure or practice that, if not correctly adhered to, could result in injury or death. Particular attention should be paid to sections of this manual where warnings appear.

## Cautions

Cautions apply to a procedure or practice that, if not correctly adhered to, could result in damage to or destruction of equipment.

## Notes

Notes are used to explain, clarify or otherwise give additional insight for a given subject, product or procedure. Please note that on occasion, notes too may advise of potential safety issues.

## Introduction

This manual is written with the professional mechanic in mind. The heavy-duty nature of these vehicles makes it difficult and, in

some cases, dangerous to perform repair operations without the benefit of professional equipment and experience.

These procedures were documented using a Blue Bird All American bus with a Cummins ISC engine and an Allison AT-545 transmission.

## Warning

*Use parking brake and wheel chocks. Be sure the vehicle is stable and the exhaust system has had ample time to cool before moving under the vehicle.*

## Preparatory Work

Park the vehicle on a level surface. If a lift of sufficient strength is used, much of the under vehicle work will be easier. Otherwise, set the parking brake and chock the rear wheels.

## Forward Engine Exhaust System Removal

### Tailpipe Section

The tailpipe section is defined as all components of the exhaust system located to the rear of the muffler. Standard equipment for the All American Forward Engine is a side-exiting exhaust system. This system exits the vehicle on the driver's side, just in front of the rear wheels. See **Figure 1**.

If your unit is equipped with optional rear exiting exhaust system, see **Figure 2**.

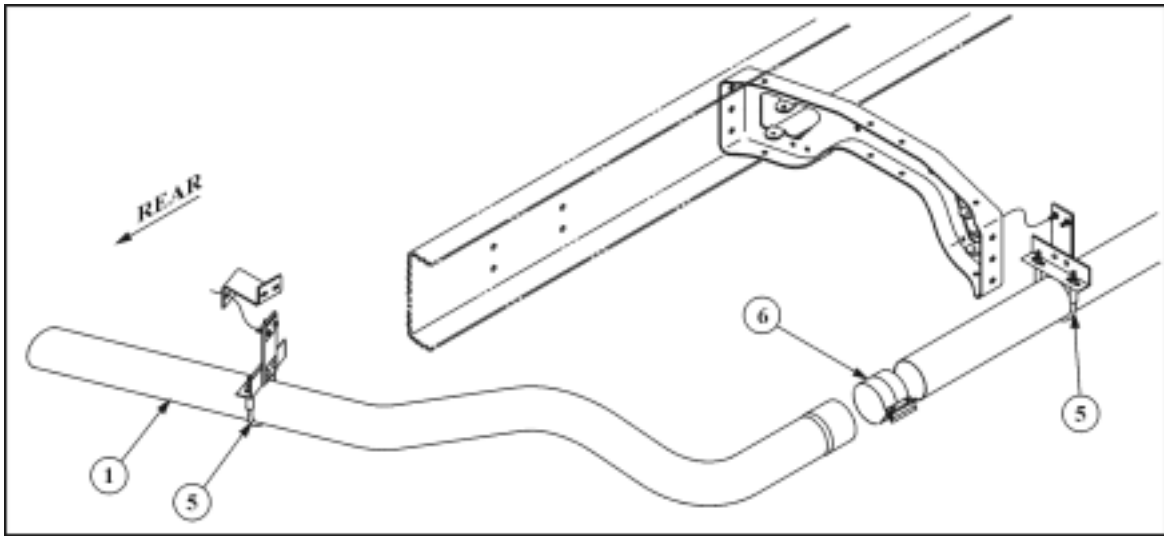


Figure 1

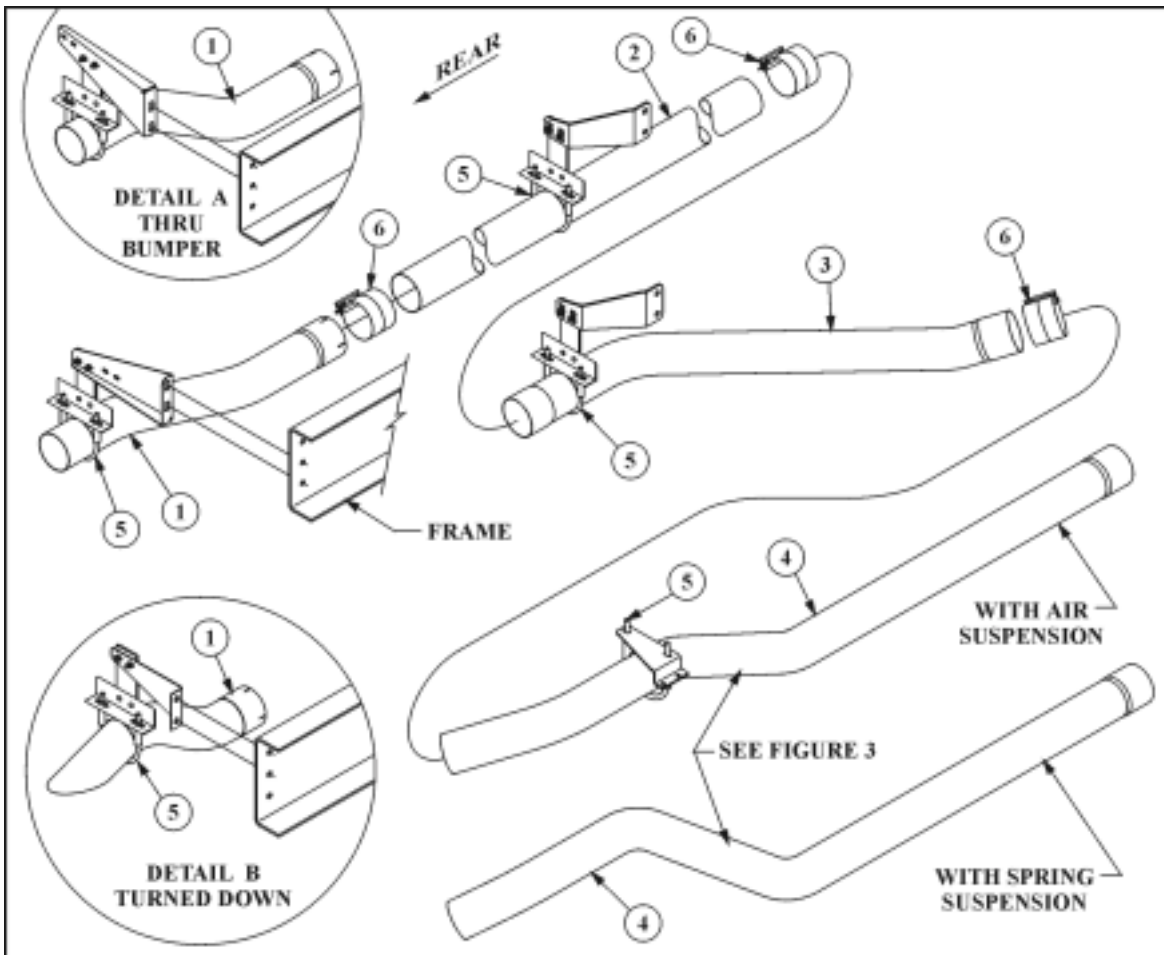


Figure 2

Start removal procedure at the exiting point of the exhaust system and work forward toward the engine.

1. Loosen nuts and washers from U-bolts (5), allowing free movement of pipe section to be removed.
2. Loosen bolts on wide band clamps (6).

### Note

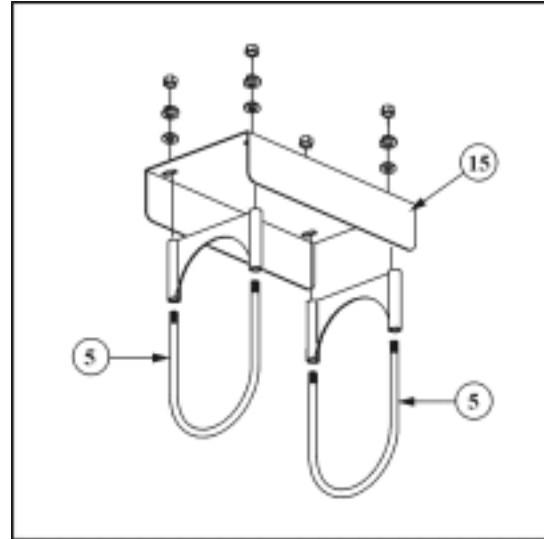
*It may be necessary to use a hammer and gently tap the pipe at the joints. This will loosen the joint compound and any corrosion, and allow for easier removal.*

3. Remove U-bolts (5) as necessary while removing pipe sections (1, 2, 3 and 4). Tailpipe section (4) must be maneuvered around rear axle.
4. Discard wide band clamps (6).

Additionally, your unit may be equipped with one of three tailpipe (1) configurations on the rear-exiting exhaust option. See **Figure 2, Detail A and B.**

Tailpipe (4) of the rear exiting exhaust option is equipped with a heat shield in order to protect adjacent chassis components

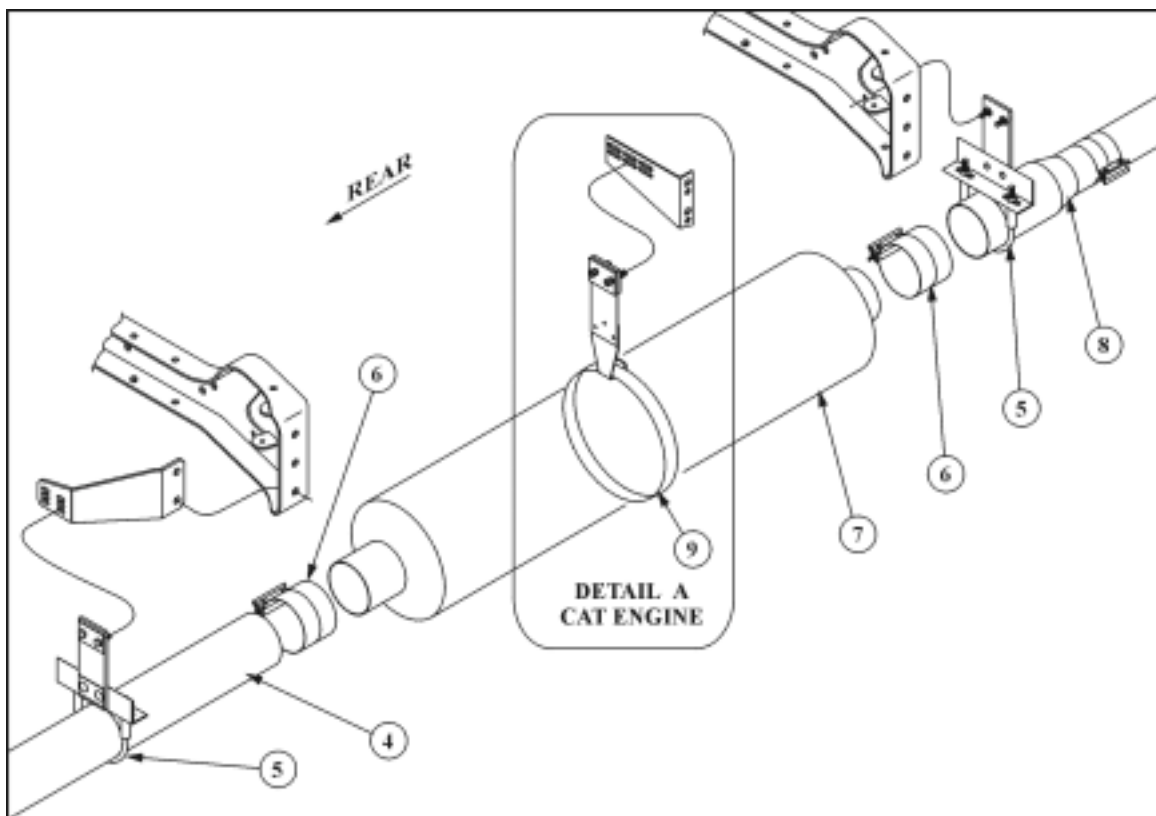
from heat damage. See **Figure 3.** Removal of the heat shield (15) can be accomplished by removing nuts and washers from the U-bolts (5).



**Figure 3**

### Muffler

To continue from the tailpipe toward the engine, see **Figure 4.**



**Figure 4**

1. Loosen nut and washers from U-bolt (5).
2. Loosen bolt on wide band clamp (6) at the rear of muffler.

### Note

*It may be necessary to use a hammer and gently tap the pipe at the joints. This will loosen the joint compound and any corrosion, and allow for easier removal.*

### Warning

*Ensure the muffler is adequately supported before continuing. The muffler is heavy and may dislodge itself when rear U-bolt (5) and tailpipe section (4) are removed.*

3. Remove U-bolt (5), tailpipe section (4) and wide band clamp (6).
4. Loosen bolt on wide band clamp (6) at the front of the muffler.

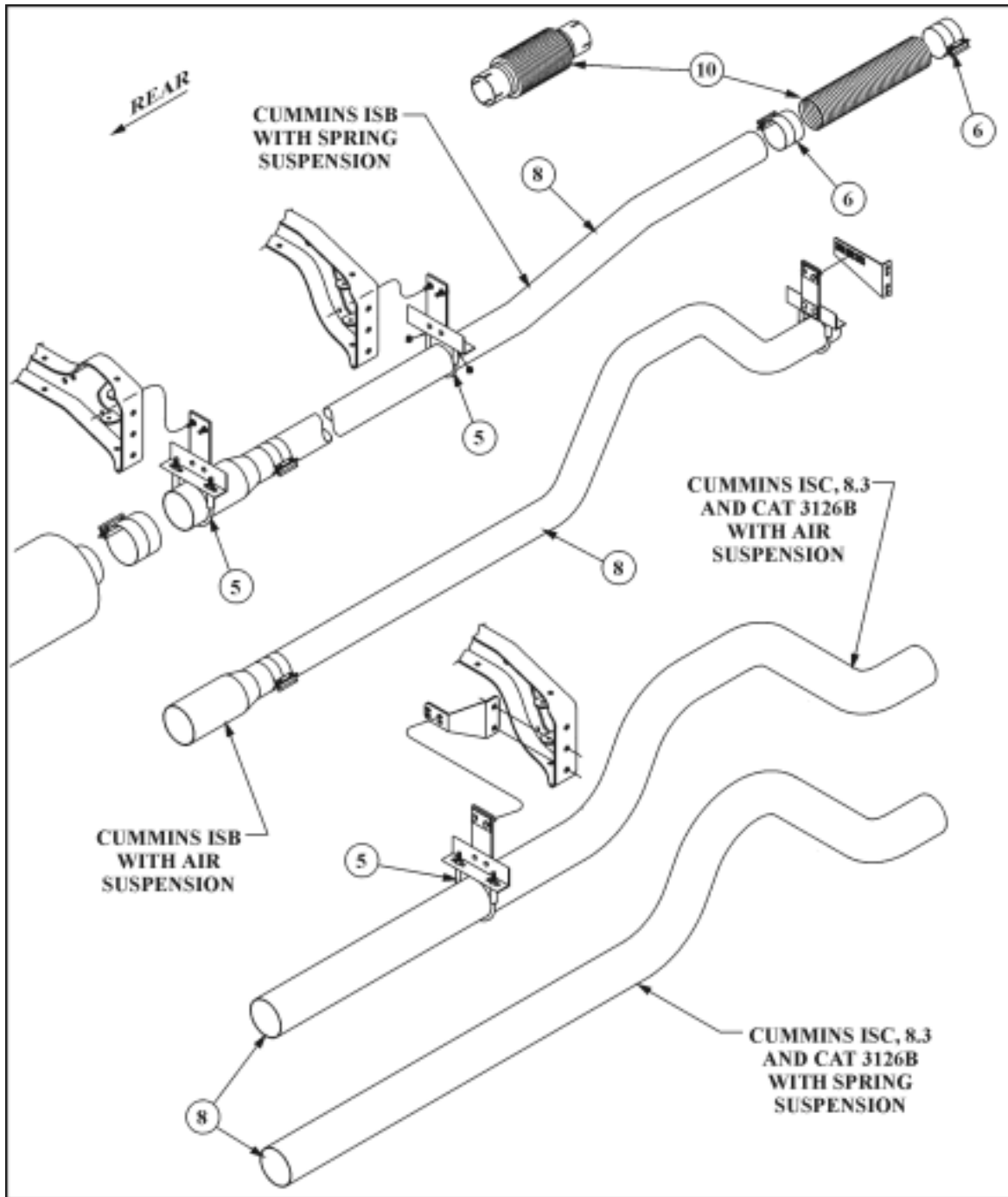
### Note

*On units equipped with a Caterpillar 3126 engine, there is a band clamp supporting the muffler at center. See **Detail A, Figure 4**. Remove bolt and band (9).*

5. Remove muffler (7). Remove wide band clamp (6) from exhaust pipe section (8).
6. Discard wide band clamps (6).

### Exhaust Pipe Section

The exhaust pipe section is defined as all components in front of the muffler forward to the turbo exhaust pipe. See **Figure 5**.



**Figure 5**

1. Loosen nuts and washers from two U-bolts (5).
2. Loosen bolts on wide band clamp (6).

**Note**

*It may be necessary to use a hammer and gently tap the pipe at the joints. This will*

*loosen the joint compound and any corrosion, and allow for easier removal.*

3. Remove U-bolts (5) and maneuver exhaust pipe section (8) from clamp (6) and around front axle.
4. Loosen bolts on wide band clamp (6) and remove flex pipe (10).

- The turbo exhaust section is defined as all components exiting at the turbo, rearward to the exhaust pipe section. See **Figure 6** for the appropriate detail for the unit being serviced.

### Figure 6

1. Loosen bolts and remove wide band clamps (6).

## Note

*The Cummins 8.3 has an additional turbo exhaust pipe extension (11) to be removed.*

2. Loosen nuts and washers and remove all U-bolts (5).
3. Loosen nut on V-band clamp (13) and remove turbo exhaust pipe (12).
4. Discard wide band clamps (6).

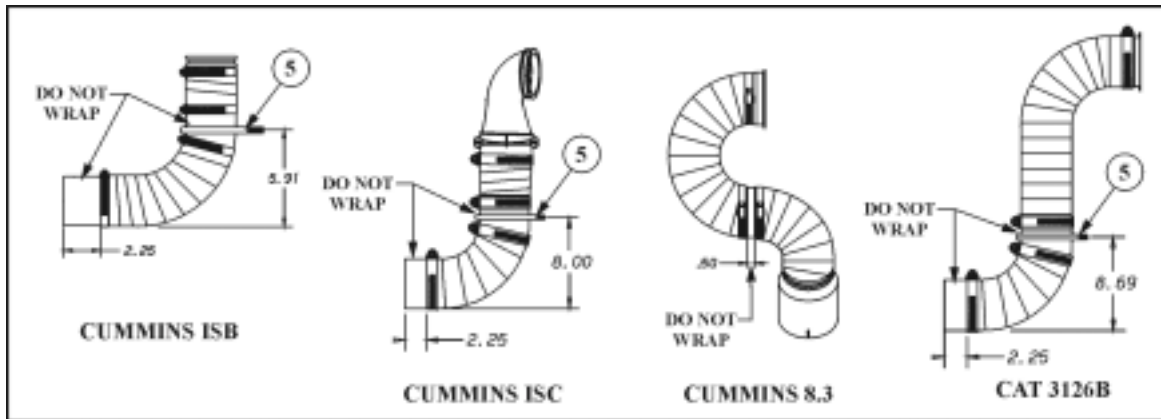
## Forward Engine Exhaust System Installation

## General Instruction

Start at the turbo and work toward the tailpipe exiting point, reversing the removal procedures of the Turbo, Exhaust, Muffler and Tailpipe sections.

## Caution

*If turbo exhaust pipe (12) insulation is damaged and/or needs replacing, remove the remaining portion and wrap pipe with insulation (BB Number 1444009) as shown. Leave ½ inch clearance between U-bolts (5) and insulation. Bind insulation at ends with band clamps (BB Number 1612761). See **Figure 7**.*



**Figure 7**

Torque V-band clamp (13) at turbo to 5 ( $\pm 2$ ) ft-lbs.

Use muffler cement (CMS) (Blue Bird Number 0832402) to seal all exhaust pipe joints. Spread muffler cement 1/8 inch thick inside the expanded end at each connection.

Leave all exhaust pipe clamps loose until all pipes are installed. It may be necessary to make minor readjustments of pipes, clamps and hanger brackets to ensure proper fit and alignment when exhaust system is secured.

Clamp all connections using NEW wide band clamps (6). Torque bolts in clamps to 50-70 ft-lbs. Pipe ends at connections must overlap at least two inches.

Torque all 3/8 inch nuts on U-bolts (5) to 5 ( $\pm 2$ ) ft-lbs.

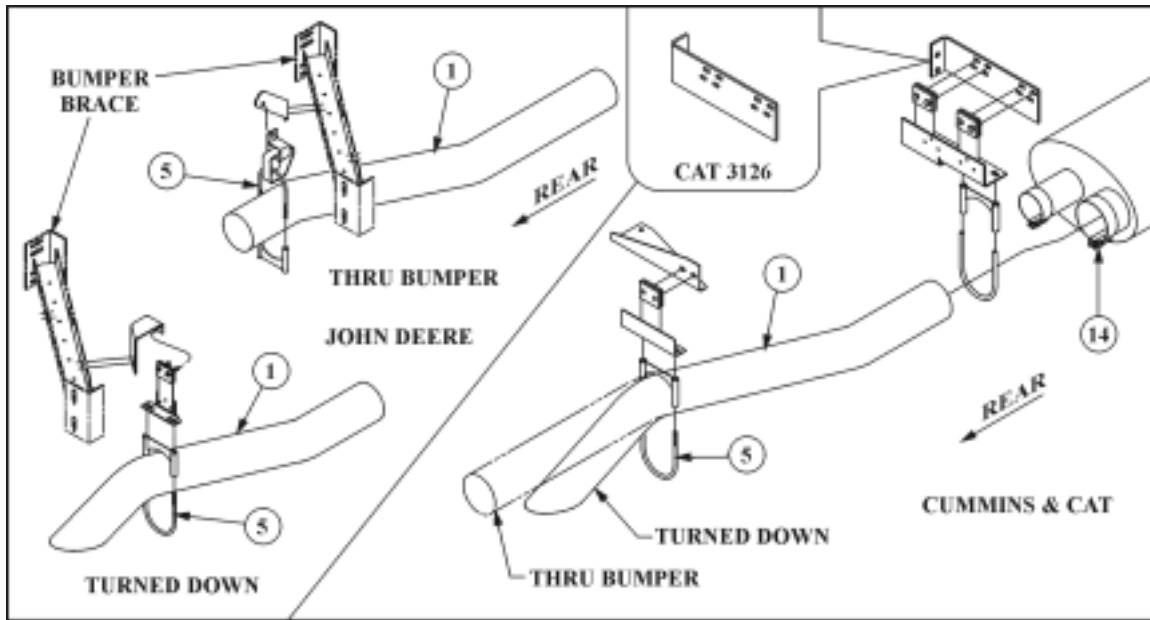
Replace hanger brackets as necessary and torque all 5/16 inch locknuts at exhaust hanger support brackets to 5 ( $\pm 2$ ) ft-lbs.

## Rear Engine Exhaust System Removal

### Tailpipe Section

The tailpipe section is defined as all components of the exhaust system between the muffler and the exiting point of the exhaust. Standard exhaust system for the All American system exits the vehicle below the rear bumper. Optionally, your vehicle may be equipped with a tailpipe that exits through the rear bumper. See **Figure 1** for the appropriate detail for the unit being serviced.





**Figure 8**

Start removal procedure at the exiting point of the exhaust system and work forward toward the engine turbo.

1. Loosen nuts and washers from U-bolt (5), allowing free movement of pipe section to be removed.
2. Loosen bolt on muffler clamp (14).

### Note

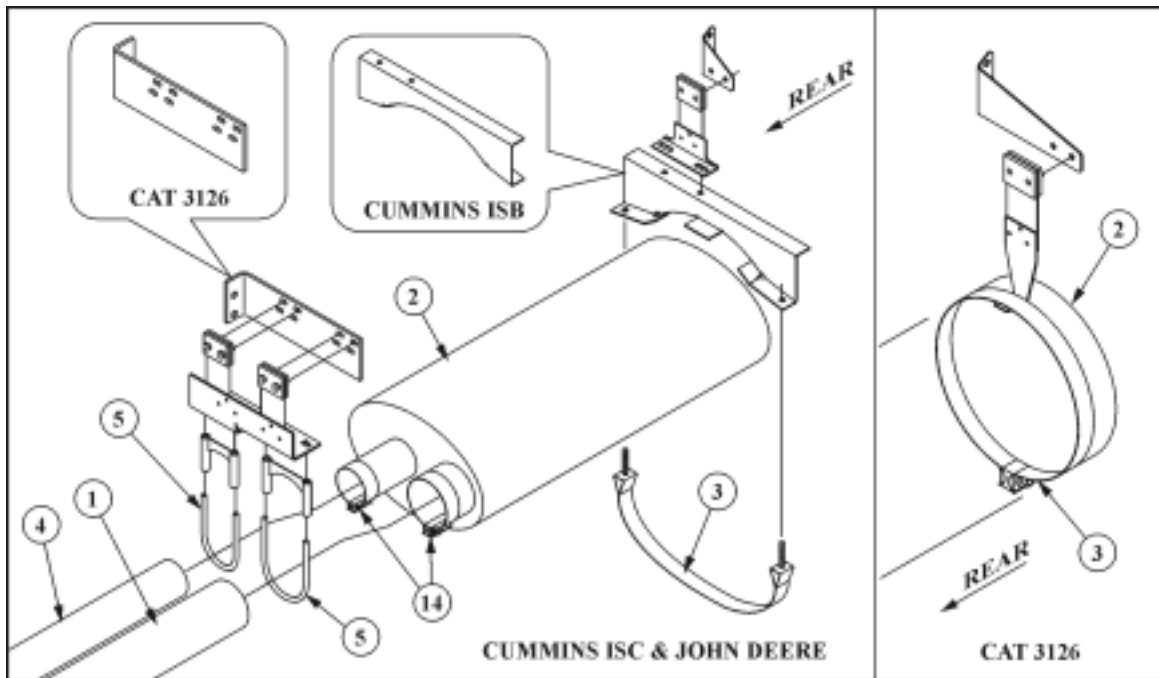
*It may be necessary to use a hammer and gently tap the pipe at the joints. This will*

*loosen the joint compound and any corrosion, and allow for easier removal.*

3. Remove U-bolt (5) and tailpipe.

## Muffler

For removal of the muffler on the rear engine, see **Figure 9** for the appropriate unit being serviced.



**Figure 9**

1. Loosen nuts and washers and remove U-bolts (5).
2. Loosen muffler clamps (14).

### **Warning**

*Ensure the muffler is adequately supported before continuing. The muffler is heavy and may dislodge itself when rear U-bolts (5), tailpipe (1) and exhaust pipe (4) are removed.*

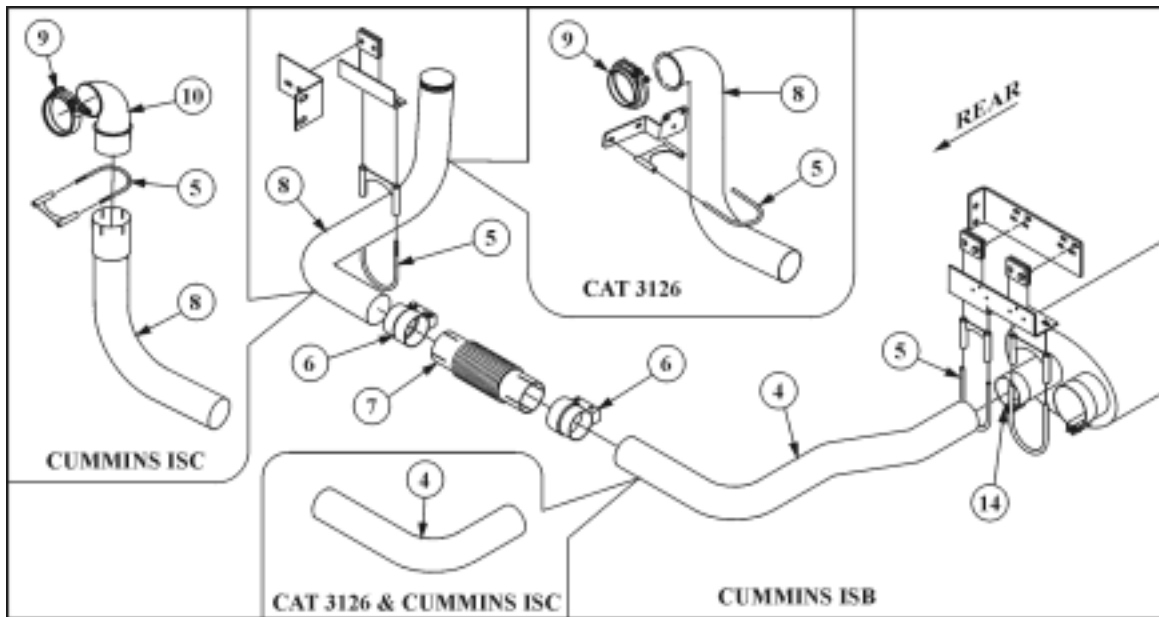
3. Remove nuts and washers from muffler band clamp (3) and remove muffler (2).

### **Note**

*To remove the muffler, tweaking may be necessary to loosen joint compound, corrosion and muffler from the adjoining pipes.*

## **Turbo and Exhaust Pipe Section**

This section includes all components of the exhaust located between the muffler and the turbo. See **Figure 10** and **11**.



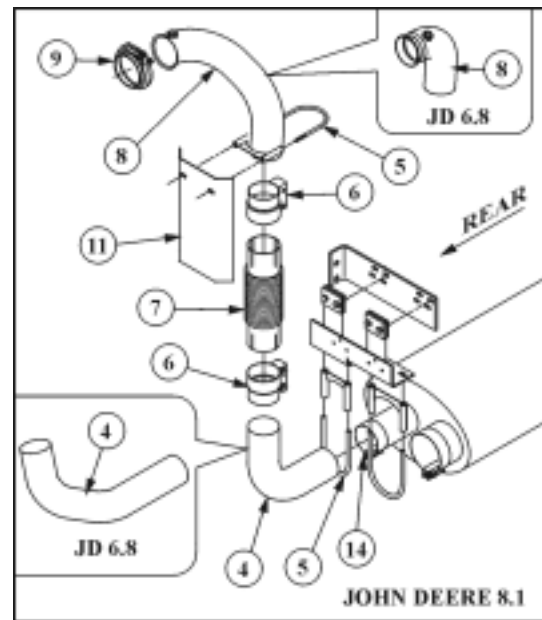
**Figure 10**

1. Remove nuts, washers and U-bolt (5), and loosen muffler clamp (14).
2. Loosen bolts on wide band clamp (6). Remove exhaust pipe (4) and wide band clamp.

### Note

*It may be necessary to use a hammer and gently tap the pipe at the joints. This will loosen the joint compound and any corrosion, and allow for easier removal.*

3. Loosen bolts on wide band clamp (6). Remove flex pipe (7) and wide band clamp.
4. Discard all wide band clamps (6).
5. Remove nuts, washers and U-bolt (5) at turbo exhaust pipe (8).
6. Loosen nut on V-band clamp (9) and remove turbo exhaust pipe (8). Remove turbo pipe (10) on Cummins ISC.



**Figure 11**

Turbo pipe (8) on the John Deere 8.1 is equipped with a heat shield (11) to protect adjacent chassis components from heat damage. See **Figure 11**. Removal of the shield can be accomplished by removing nuts and washers from the U-bolts.

# Rear Engine Exhaust System Installation

## General Instruction

Start at the turbo and work toward the tailpipe exiting point, reversing the removal procedures of the Turbo, Exhaust, Muffler and Tailpipe sections.

Torque V-band clamp (9) at turbo to 5 ( $\pm$  2) ft-lbs.

Use muffler cement (CMS) (Blue Bird Number 0832402) to seal all exhaust pipe joints. Spread muffler cement 1/8 inch thick inside the expanded end of each connection.

Leave all exhaust pipe clamps loose until all pipes are installed. It may be necessary to make minor readjustments of pipes, clamps and hanger brackets to ensure proper fit and alignment when exhaust system is secured.

Clamp all connections using NEW wide band clamps (6). Torque bolts in clamps to 50-70 ft-lbs. Pipe ends at connections must overlap at least two inches.

Torque all 3/8 inch nuts on U-bolts (5) to 5 ( $\pm$  2) ft-lbs.

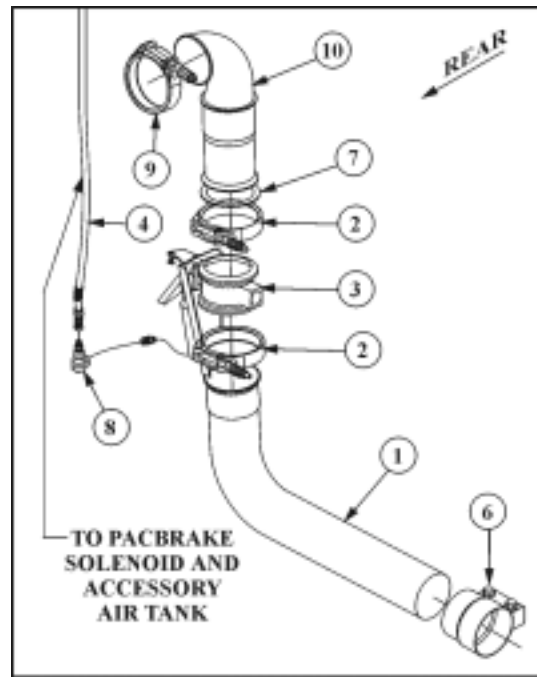
Replace hanger brackets as necessary and torque all 5/16 inch locknuts at exhaust hanger support brackets to 5 ( $\pm$  2) ft-lbs.

## Exhaust Brake

### Removal

Your All American Rear Engine unit with Cummins ISC engine may be equipped with an optional exhaust brake. This feature is designed to assist and extend the life of the service air brakes. Use the following instructions for removal of the exhaust

brake, starting at the flexpipe and working toward the turbo. See **Figure 12**.



**Figure 12**

### Warning

*Discharge air pressure from the accessory air tank on the right hand frame rail.*

1. Loosen bolts on wide band clamp (6) located between the flexpipe and turbo exhaust pipe (1).

### Note

*It may be necessary to use a hammer and gently tap the pipe at the joints. This will loosen the joint compound and any corrosion, and allow for easier removal.*

2. Loosen bolt on tension clamp (2) and remove.

### Warning

*Minimum line air pressure discharge may occur in Step 3.*

3. Disconnect air line (4) from valve (8).
4. Loosen bolt on tension clamp (2) and remove. Remove exhaust brake (3).  
Note the mounted position of the exhaust brake for re-installation purposes.
5. Discard gasket (7).
6. Loosen bolt on clamp (9) and remove turbo pipe (10).

## Installation

Reversing the above procedures, starting with the turbo and working toward the muffler can accomplish installation of exhaust brake feature. Reference **Figure 12**.

Torque V-band clamp (9) at turbo to 5 ( $\pm$  2) ft-lbs.

Replace exhaust brake gasket (7).

## Caution

*Mount the exhaust brake in the same position it was removed from, in order to clear frame rail.*

Re-attach air line fittings using thread sealant (Blue Bird Number 0905745) or equivalent.

Leave all exhaust pipe clamps loose until all pipes are installed. It may be necessary to make minor readjustments of pipes and clamps to ensure proper fit and alignment when exhaust system is secured.

Clamp all connections using NEW wide band clamps (6). Torque bolts in clamps to 50-70 ft-lbs. Pipe ends at connections must overlap at least two inches.

The unit must be road tested in order to set back pressure for exhaust brake operation.

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