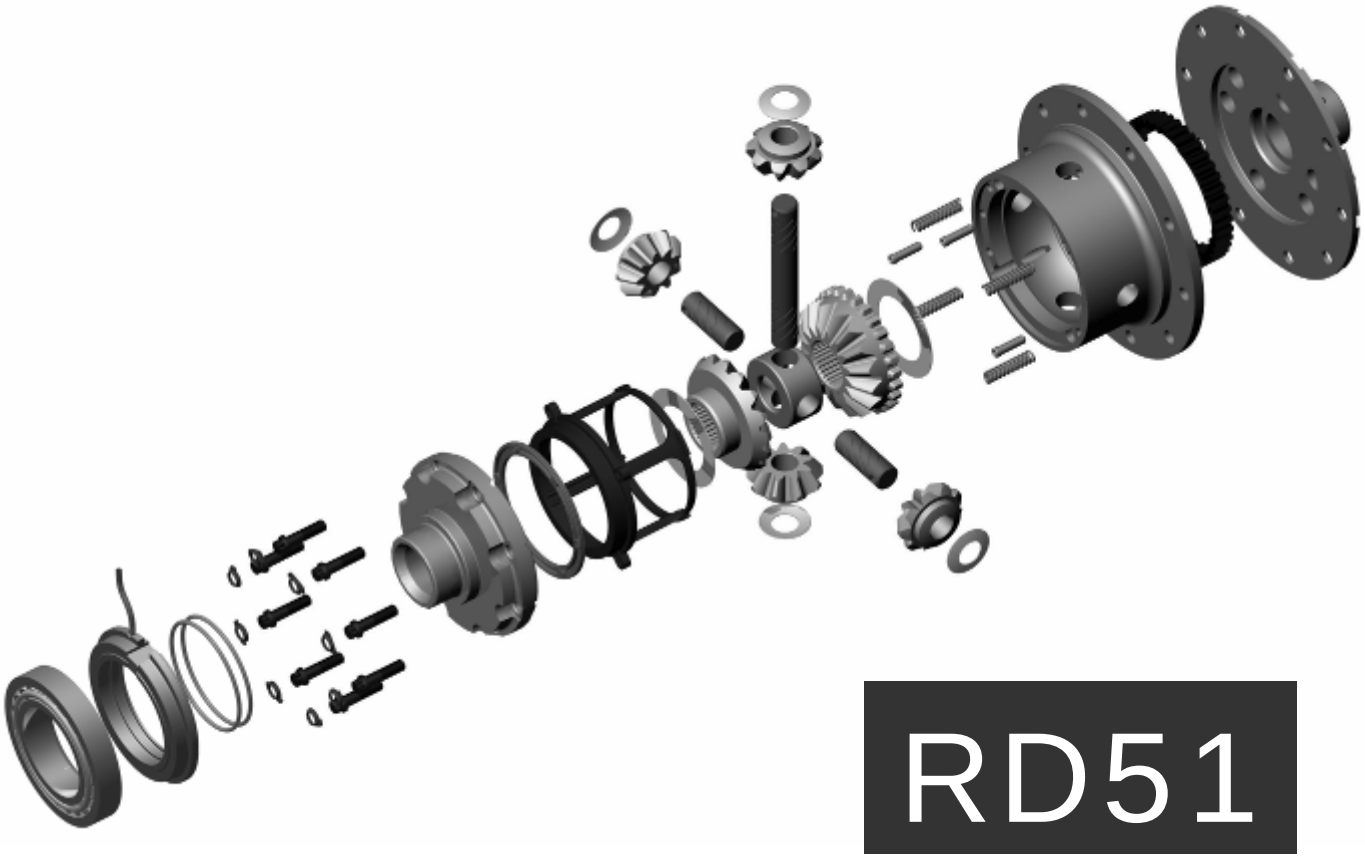
ARB AIR LOCKER

AIR OPERATED LOCKING DIFFERENTIALS

INSTALLATION GUIDE



RD51

GM / AAM 9.25”, 33 SPLINE

Part No. 210251
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ARB 4x4 ACCESSORIES

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1 Introduction

IMPORTANT :

BEFORE ATTEMPTING TO DISMANTLE YOUR VEHICLE FOR THIS INSTALLATION, PLEASE READ THIS INSTALLATION GUIDE IN ITS ENTIRETY, AS WELL AS ALL APPLICABLE SECTIONS OF YOUR VEHICLE MANUFACTURER'S SERVICE MANUAL.

1.1 Pre-Installation Preparation

This booklet is to be used in conjunction with your vehicle manufacturer's service manual. ARB endeavors to account for every possible variation in vehicle model when publishing its installation guides, and guides are updated regularly as new model information becomes available, however, the rapid and globally varied release of some vehicles makes it difficult to insure that your vehicle model has been accurately accounted for. In the case of any technical discrepancies between this guide and your service manual, we strongly advise that you adhere to the specifications and techniques as documented in your service manual.

Although your *ARB Air Locker* comes complete with all the step by step instructions you will need to supplement your vehicle manufacturer's service manual and install your new differential, ARB recommends that you have your *Air Locker* installed by a trained professional. Many ARB distributors around the world have been fully instructed in *Air Locker* installations by ARB, and have gained a wealth of experience and skill from years of performing similar installations.

Once you begin this installation your vehicle will be immobile until all steps of the installation are complete. Make sure your *Air Locker* kit is the correct model for your vehicle and that it contains all of the parts listed on back cover of this booklet. Also be sure you have appropriately equipped yourself with all the necessary tools, parts, and materials to complete this installation (see section 1.2 *Tool-Kit Recommendations*), and that you have allowed for an appropriate amount of vehicle down time.

HINT : **Place a ✓ mark inside each of the ☐ symbols as you complete each step. It is very important NOT to miss any of the steps!**

1 Introduction

1.2 Tool-Kit Recommendations

Below is a list of tools and supplies you may need to complete this installation. Requirements for your vehicle may vary. Please consult your vehicle service manual for additional recommendations.

1.2.1 Tools

- ☐ Standard automotive sizes (metric and/or imperial) of sockets, wrenches, Alan keys, and drills.
- ☐ A dial indicator or other suitable measuring tool for checking ring & pinion backlash.
- ☐ An adjuster-nut wrench. (See your vehicle service manual.)
- ☐ A razor knife to cut the nylon tubing.
- ☐ A torque wrench. (See vehicle service manual for required torque range.)
- ☐ A lubricant drain reservoir.
- ☐ A 11.2mm [7/16”] drill and ¼” NPT tap for bulkhead fitting installation.
- ☐ An automotive bearing puller (2 jawed is recommended) or a differential carrier bearing puller.
- ☐ A bearing press or arbor press.
- ☐ Automotive brake line tubing cutter.

1.2.2 Supplies

- ☐ Thread lubricant/sealant compound for pressure fittings (e.g., LOCTITE #567 Teflon paste)
- ☐ Thread locking compound (e.g., LOCTITE #272)
- ☐ Either a replacement gasket, or gasket sealant, for your differential cover.
- ☐ A sufficient volume of differential oil to completely refill your housing. (see the *ARB Air Locker Operating and Service Manual* for recommended lubricants)
- ☐ A soap and water mixture to test for air leaks.

1 Introduction

1.3 Assembly Type Identification

IMPORTANT:

Sections 2 and 3 of this installation guide have been written to accommodate two different application installations:

A the Independent Front Suspension (IFS) type with an aluminum clamshell housing (Refer to Fig.1.)

B the live axle Salisbury type with a cast iron housing. (Refer to Fig.2.)

To eliminate confusion, you should identify which figure your vehicle matches with. The section numbers within the guide that refer ONLY to the IFS type have been suffixed with an '**A**', and those that refer ONLY to the live axle type have been suffixed with a '**B**'.

PLEASE IGNORE ALL SECTIONS WHICH DO NOT APPLY TO YOUR APPLICATION

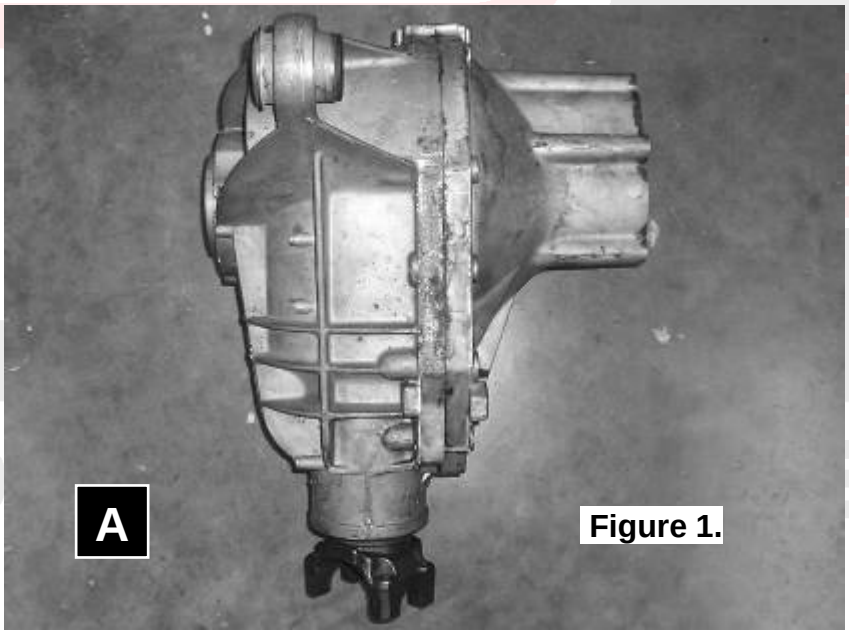


Figure 1.

Figure 2.

2 Removing the Existing Differential

2.1 Vehicle Support

- ☐ Safely secure the vehicle on a hoist. We recommend supporting the vehicle on a chassis hoist to keep the differential area at a convenient working height and to leave the wheels and axles free to be rotated and removed.
- ☐ Once supported off the ground, release the parking brake and leave the vehicle in neutral. Chock the wheels if necessary.

2.2 Differential Fluid Drain

HINT : **This is a good time to check for metal particles in your oil, on your drain plug, or in the bottom of the housing, which may indicate a worn bearing or differential component.**

2.2.1 A IFS Fluid Drain

- ☐ Remove any skid plates covering the bottom of the front axle area and position a fluid drain reservoir under the differential.
- ☐ Remove the threaded drain plug and completely drain all differential oil from the housing.
- ☐ Finger-tighten the drain plug back in to prevent drips during the removal of the axle assembly.

2.2.2 B Live Axle Fluid Drain

- ☐ Clean around the differential cover plate seal to prevent dirt from entering the differential.
- ☐ Position a fluid drain reservoir under the differential and loosen all differential cover plate retaining bolts.
- ☐ Gently pry the cover plate away from the differential housing to completely drain all differential fluid.
- ☐ Once drained, remove the differential cover plate.

HINT : **It would be a good idea to drill and tap for a tapered oil drain plug to assist with future oil changes.**

2 Removing the Existing Differential

2.3 Disconnecting the Axles

NOTE : **The oil seals are delicate and can be easily damaged. Support the weight of the axle shafts when drawing them out of their sockets in the housing.**

2.3.1 A IFS CV Shafts

- ☐ Remove the stub axles from the differential housing according to your vehicle manufacturer's service manual.
- ☐ Disconnect the drive shaft from the pinion flange.
- ☐ Completely remove the differential assembly from the vehicle.

2.3.2 B Live Axle Shafts

IMPORTANT :

Collision damage or heavy off-road use of your vehicle in the past may have resulted in some degree of bending in the axle. Any misalignment of the axle tubes may result in excessive wear and/or failure of your differential and axle shafts. ARB strongly recommends that you have your axle assembly inspected for concentricity and straightness before installing your *Air Locker*.

- ☐ Remove the wheels, and brakes according to your vehicle manufacturer's service manual.
- ☐ Unbolt the four bolts retaining the hub and withdraw the axle shafts.

2 Removing the Existing Differential

2. 4 B Marking the Bearing Caps

☐ Using a pointed center punch, gently mark the bearing caps in a way that will enable you to know which cap is 'LEFT' and which cap is 'RIGHT', which way is 'UP' and which way is 'DOWN'. (Fig.3.)

HINT : **Many installers choose to make one punch mark on the left hand side of the left hand bearing cap and one similar punch mark on the housing at close proximity to the cap mark. The right hand side is then designated with two punch marks on the right hand side of the cap and two similar punch marks on the housing.**

Figure 3.

2.5 Checking the Current Backlash Amount

IMPORTANT:

This step is a precautionary measure recommended by ARB due to the fact that some after market ring and pinion sets have been manufactured to run with different backlash settings than those specified by your vehicle manufacturer. Although ARB must recommend you set backlash according to your service manual guidelines, we also advise that you compare the backlash measurements taken here to the recommended backlash settings in your vehicle service manual. Measurements found to be outside of your service manual recommendations may indicate the need to deviate from those settings in order to achieve quiet running with a good contact mark.

Refer to your vehicle service manual or your local authorized ARB installer for more information.

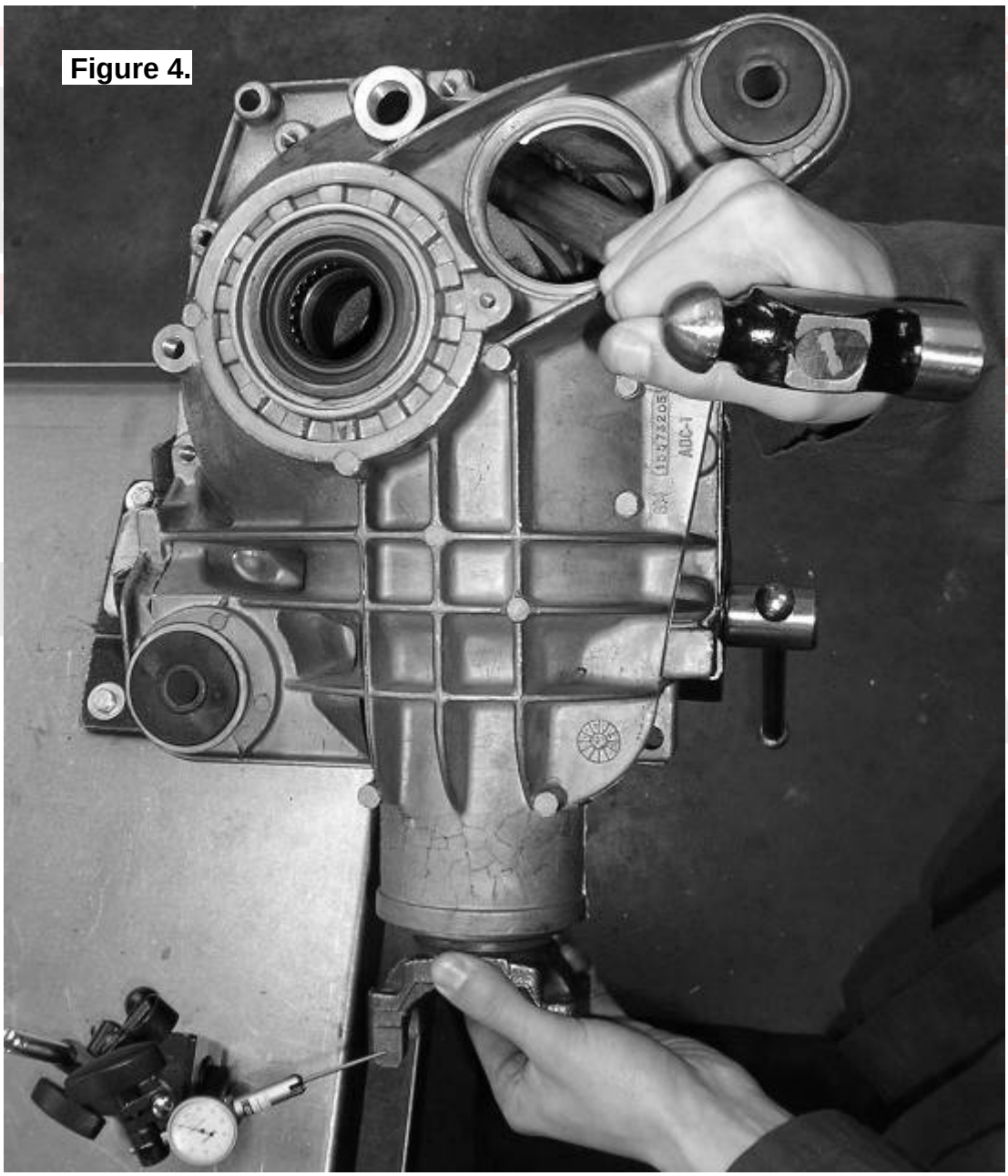
2 Removing the Existing Differential

2.5.1 A Backlash Measurement of IFS Clamshell

NOTE : **Because access to the ring gear is difficult in the clamshell housing, the following alternative method for measuring backlash has been provided.**

- ☐ Firmly clamp the differential housing in a vice or to a workbench.
- ☐ Set up a depth indicator with a magnet base on the vice or bench and position the indicator tip on the machined flat of the pinion yoke as shown in figure 4.
- ☐ Remove the breather to allow a hammer handle or other suitable device to be jammed against the ring gear teeth to prevent the differential center from rotating. (Fig.4.)

Figure 4.



2 Removing the Existing Differential

- ☐ With the hammer handle preventing the differential from rotating, rotate the pinion yoke in both directions while observing the maximum variation in depth from the indicator (i.e., the highest value minus the lowest value). This value will be comparable to the ring and pinion backlash and provide an accurate method for setting up the backlash once the *Air Locker* is installed.
- ☐ Rotate the differential center 90° and measure again for accuracy.
- ☐ Record the average of all measurements.

2.5.2 B Backlash Measurement of Live Axle

- ☐ Set a depth indicator on one of the ring gear teeth as in figure 5.

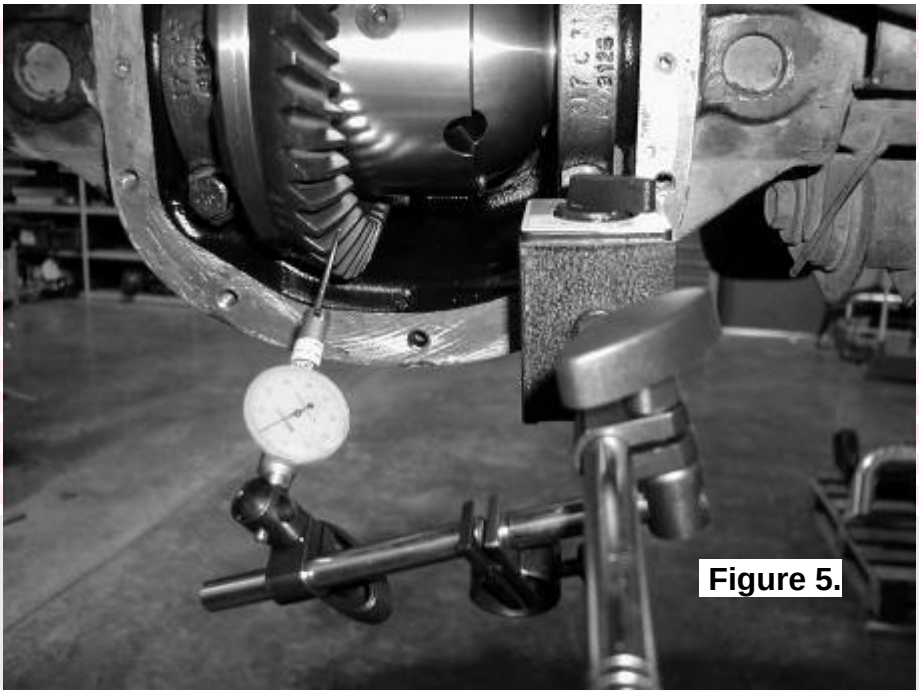


Figure 5.

- ☐ While supporting the pinion gear by holding the drive shaft flange, rotate the differential in both directions while observing the maximum variation in depth from the indicator (i.e., the highest value minus the lowest value). This value is referred to as the ring and pinion backlash.
- ☐ Rotate the differential center 90° and measure again for accuracy.
- ☐ Record the average of all measurements.

2 Removing the Existing Differential

2.6 Removing the Differential Center

2.6.1 A IFS Clamshell Differential Center Removal

- ☐ Remove all bolts from around the outside of the clamshell.
- ☐ Gently pry the clamshell apart and remove the differential center.

NOTE : **The differential center is heavy and quite difficult to handle when covered in oil. Take care not to drop it.**

2.6.2 B Live Axle Differential Center Removal

- ☐ Remove both adjuster nut locking tabs.
- ☐ Loosen both bearing caps.
- ☐ Loosen the adjuster nuts enough to remove the differential center.
- ☐ Remove the bearing caps and tapered roller bearing cups.

HINT : **Be sure not to mix up the bearing cups. Later it will be necessary to match the bearing cups to their cones.**

- ☐ Carefully remove the differential center.

NOTE : **The differential center is heavy and quite difficult to handle when covered in oil. Take care not to drop it.**

3 Installing the Air Locker

3.1 Re-Mounting the Ring Gear

☐ Remove the bolts that hold the ring gear in place.

NOTE : **GM/AAM 9.25” ring gear bolts are usually left hand threaded.**

☐ Using a plastic or copper hammer, tap in a circle around the ring gear to separate it from the original differential carrier.

☐ Apply a thin film of high-pressure grease to the ring gear shoulder of the *Air Locker* to prevent seizing.

☐ Thoroughly clean any thread locking compound or other foreign matter from the holes of the ring gear, the threads of the ring gear bolts, and the mating surfaces between the ring gear and the *Air Locker* flange.

HINT : **Stoning the ring gear mounting face before installation will remove any high spots around the threads.**

☐ Heat the ring gear to between 80 and 100°C [175 - 212°F] in hot water or in an oven to slightly expand the gear and facilitate assembly.

NOTE : **<u>NEVER HEAT GEARS WITH A FLAME!</u> This could damage the hardened surface of the gear and result in premature wear or failure.**

☐ Dry the gear and bolt holes with compressed air (if wet).

☐ Install the ring gear onto the *Air Locker* by aligning the bolt holes and then gently tapping it around in a circle with a soft mallet. Avoid using the bolts to pull down the ring gear as this puts excess strain on the bolts and the differential flange.

☐ Apply a thread locking compound to the thread of each ring gear bolt before inserting it. Do not apply threading compound directly into the threaded hole as this could prevent the bolt from reaching its full depth.

☐ Tighten the ring gear bolts in a star pattern with a torque wrench according to your vehicle manufacturer’s specified torque.

3 Installing the Air Locker

3.2 Assembling the Seal Housing

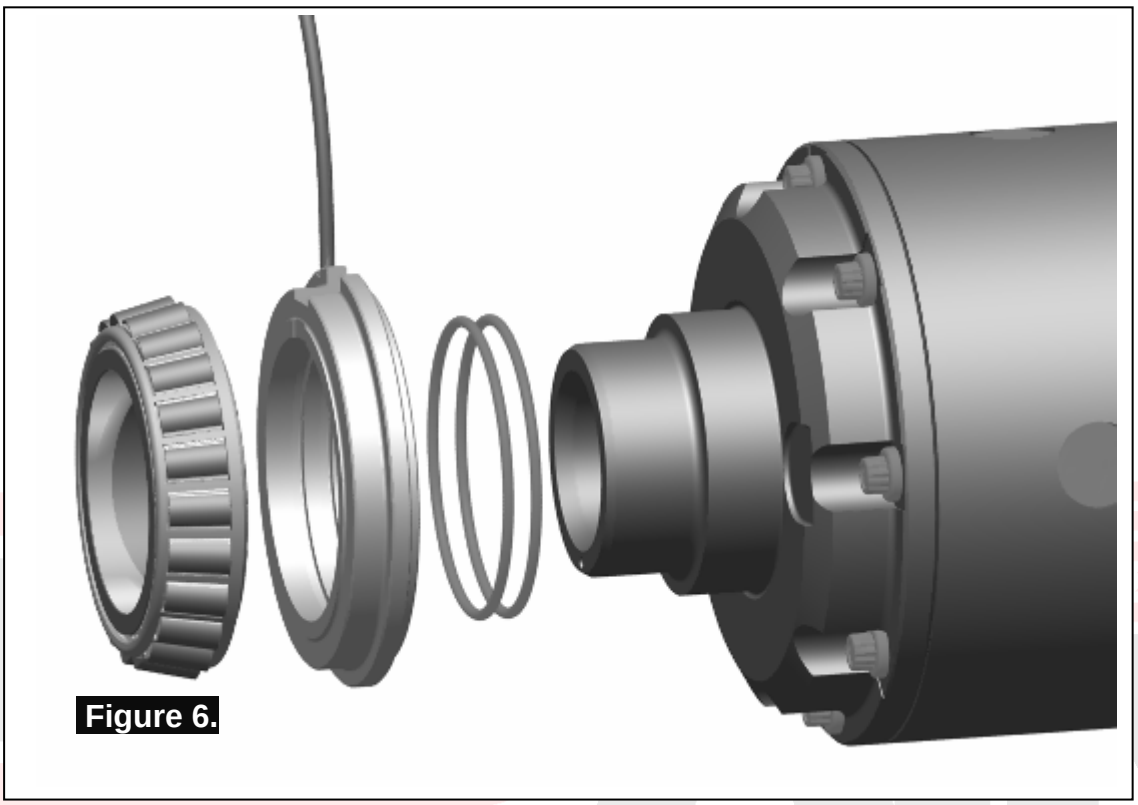


Figure 6.

- ☐ Make sure the grooves and airway of the seal housing are clean and free from any contaminants (e.g. water, dirt, metal filings, etc.).
- ☐ Inspect the seal housing O-rings (supplied) for dirt, damage or other conditions which might cause leaks.
- ☐ Generously lubricate the O-rings with oil prior to assembly, then insert them into the grooves of the seal housing.

NOTE : **When assembling the O-rings, be careful not to leave them twisted when seated in the grooves as this could cause excessive wear and leakage.**

- ☐ Lubricate the seal housing running surface on the *Air Locker* carrier with oil.
- ☐ Carefully install the seal housing by sliding it all of the way onto the bearing journal with a gentle twisting motion. This will allow the O-rings to engage gently.

NOTE : **Make sure the orientation of the seal housing is as shown in figure 6., with the seal housing flange closest to the cylinder cap.**

3 Installing the Air Locker

3.3 Installing the Carrier Bearings

- ☐ If the tapered roller bearings from the original differential carrier are to be reused, then remove them with an automotive bearing puller and inspect them for damage and/or wear and replace them if necessary.
- ☐ Apply a thin film of high-pressure grease to both bearing journals of the *Air Locker* to prevent seizing.
- ☐ Using a bearing press or arbor press, press one of the bearing cones onto one bearing journal of the *Air Locker* (refer to figure 7.) until the bearing seats firmly against the bearing journal shoulder.

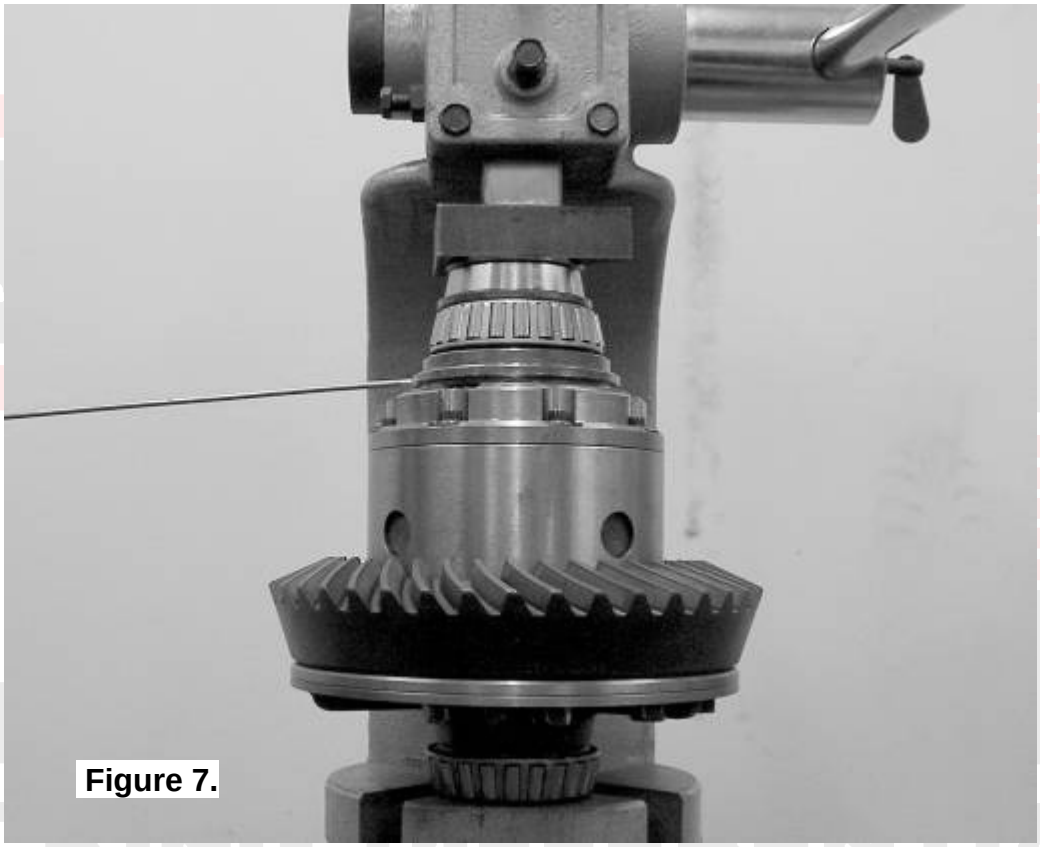


Figure 7.

- ☐ Invert the *Air Locker* and press the other tapered roller bearing cone onto the opposite bearing journal of the differential carrier until the bearing seats firmly against the bearing journal shoulder.

3.4 Drilling and Tapping the Bulkhead Port

An airline port must be drilled and tapped through the differential housing to mount the bulkhead fitting into.

3.4.1 A Port Location on the IFS Clamshell Housing

NOTE : **A cutout template for positioning the bulkhead port has been provided (Fig. 28. on pg. 37) and must be used to accurately locate the port and ensure clearance between the seal housing tube, *Air Locker* and breather.**

☐ Using the cutout template center punch a drill start on the outside shell of the housing as in figure 8.

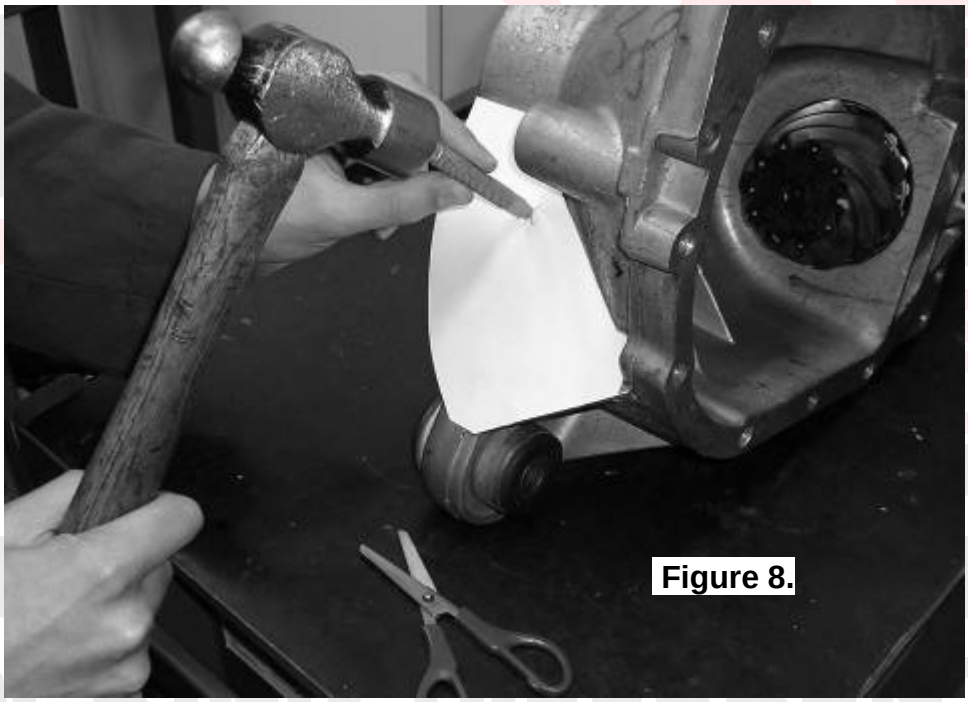


Figure 8.

☐ Cover the drive pinion and axle tube areas with a rag to protect them from metal filings.

☐ Drill through the housing square to the outside surface using a 11.2mm [7/16”] drill.

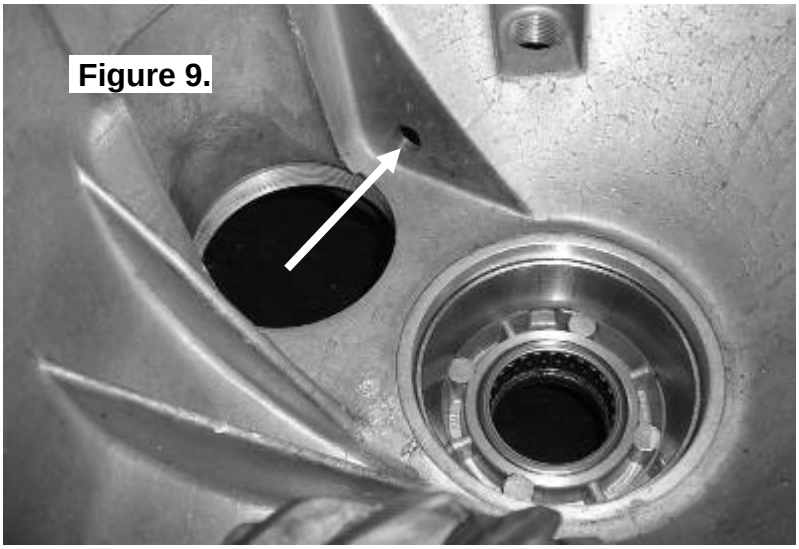
☐ Tap the hole from the outside using a ¼” NPT pipe tap.

☐ Remove any sharp edges from the hole that may chip-off and fall into the housing.

☐ Carefully remove the rags and inspect with a service light inside the housing to insure no metal filings are left behind.

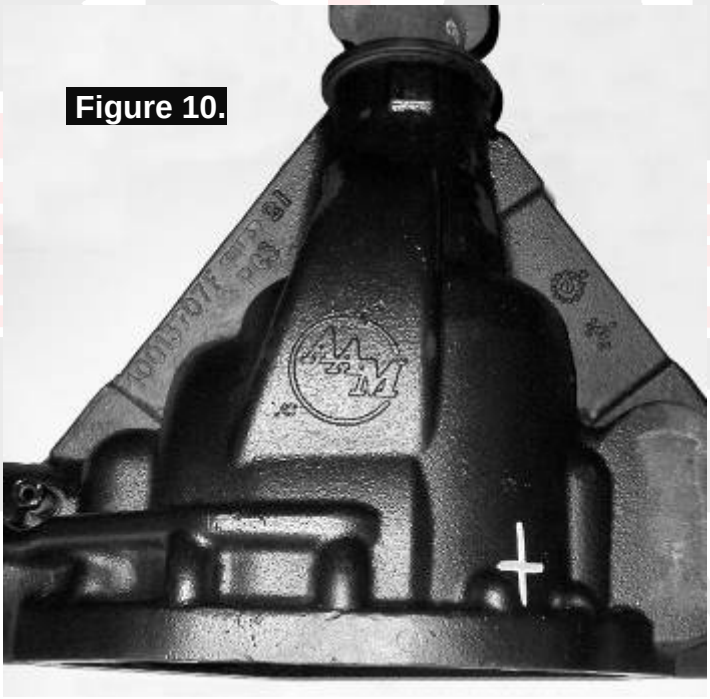
☐ When viewed from inside the housing the bulkhead port position must be as shown in figure **9.**

3 Installing the Air Locker



3.4.2 B Port Location on the Live Axle Housing

☐ Mark a spot on the top of the outside shell of the differential housing as shown in figure 10.



☐ Cover the drive pinion and axle tube areas with a rag to protect them from metal filings.

☐ Drill through the housing square to the outside surface using a 11.2mm [7/16”] drill.

☐ Tap the hole from the outside using a ¼” NPT pipe tap.

☐ Remove any sharp edges from the hole that may chip-off and fall into the housing.

☐ Carefully remove the rags and inspect with a service light inside the housing to insure no metal filings are left behind.

3 Installing the Air Locker

3.5 A Installing the Seal Housing Locking Tab

The seal housing locking tab is installed in the half of the clamshell housing that contains the pinion gear.

- ☐ Remove the adjuster nut locking tab and unscrew the adjuster nut from the housing.
- ☐ Using a drill press, carefully drill a 5.0mm [3/16”] hole through the adjuster nut locking tab bolt hole (taking care not to damage the existing threads) to the inside of the housing. (See Fig.11.)
- ☐ Turn the housing over and tap 12mm [1/2”] deep into the drilled hole using an M6x1.0 tap. (as shown in Fig.12.)
- ☐ In order to space up the locking tab from the adjuster nut, place the two round washers supplied into housing in line with the tapped hole followed by the seal housing locking tab.
- ☐ Insert the supplied M6 socket head bolt and tighten while pushing the tab up against the web in the housing as shown in figure 13.

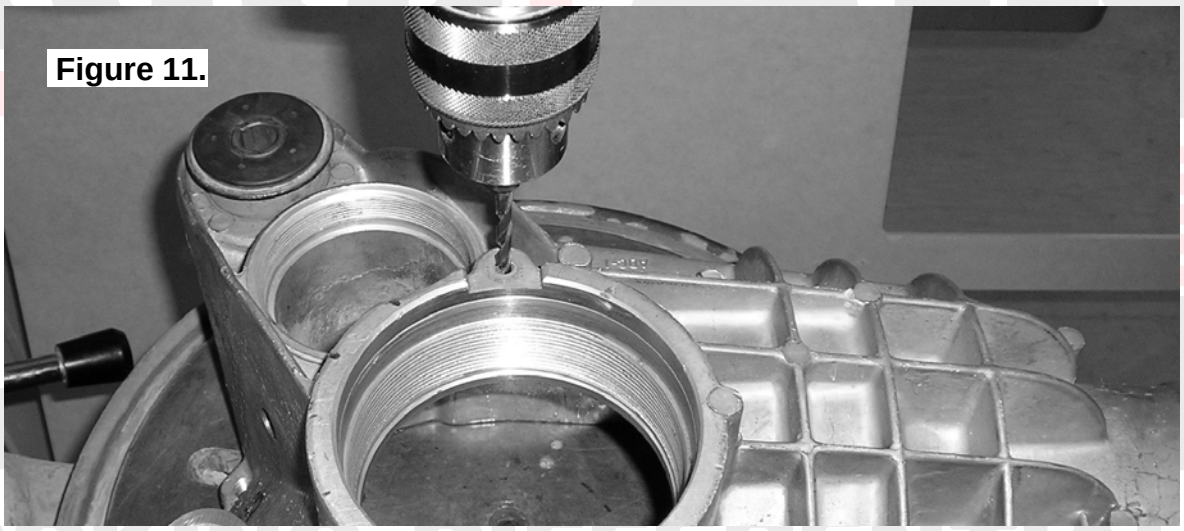


Figure 11.

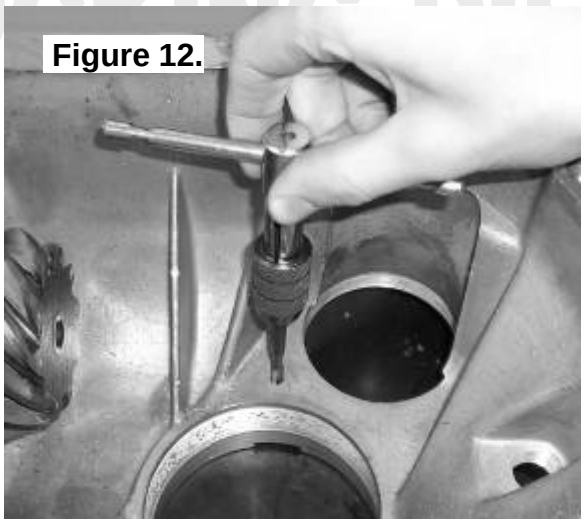


Figure 12.

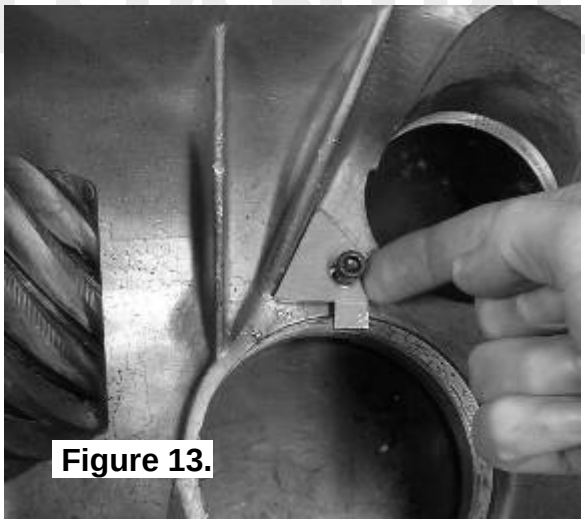


Figure 13.

3.6 Final Air Locker Assembly

3.6.1 A Assembly into IFS Clamshell Housing

- ☐ Place the *Air Locker* into the clamshell half without the pinion gear so that the seal housing is at the top.
- ☐ Rotate the seal housing until the notch is facing the housing bolt hole as shown in figure 14.
- ☐ Without using sharp, jagged tools such as pliers (your hands are the best tool for this job), gently bend the seal housing tube into the hook shaped profile shown in figure 14.

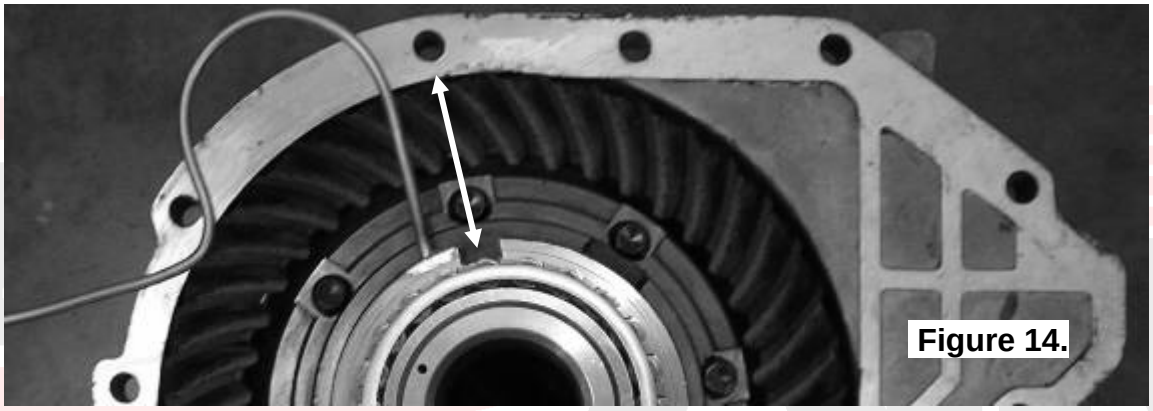


Figure 14.

- ☐ Place the pinion gear clamshell half on top while feeding the copper tube through the bulkhead port and aligning the seal housing locking tab with the slot in the seal housing. (See Fig.15.)
- ☐ Mark the point were the seal housing tube is extended 10mm [3/8”] through the bulkhead port, remove the pinion gear clamshell half and trim the tube at the mark using an automotive brake line cutter.

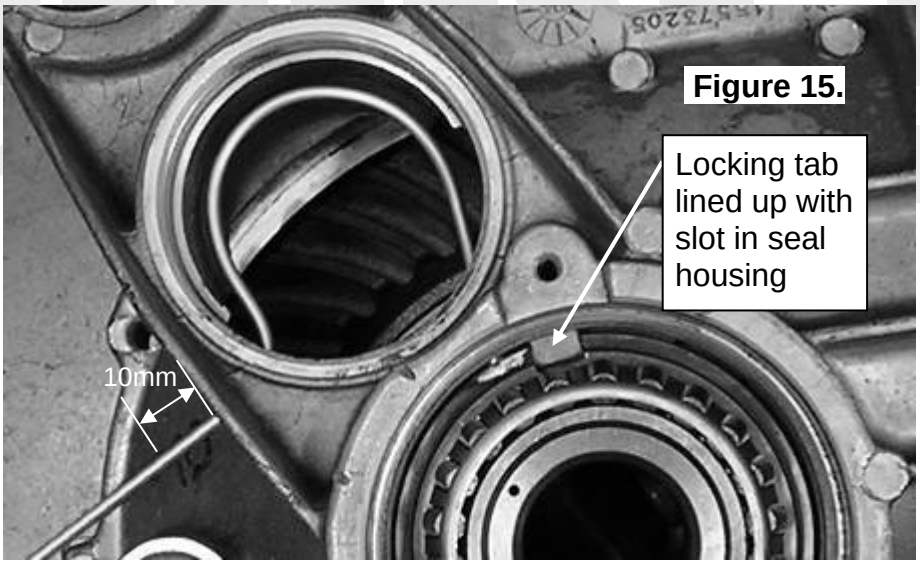


Figure 15.

- ☐ Replace the pinion gear clamshell half and bolts and tighten to the torque specified in your vehicle manufacturer’s service manual. Replace the adjuster nut and hand tighten.

3 Installing the Air Locker

3.6.2 B Assembly into Live Axle

☐ Reinstall the *Air Locker* into the axle housing.

☐ Leaving the bolts out as this stage, install the bearing caps orientated as they were marked before they were removed.

☐ Rotate the seal housing so that the slot is pointing straight out of the axle opening. Then install the supplied seal housing bracket with the tab locating in the seal housing slot as shown in figure 16.

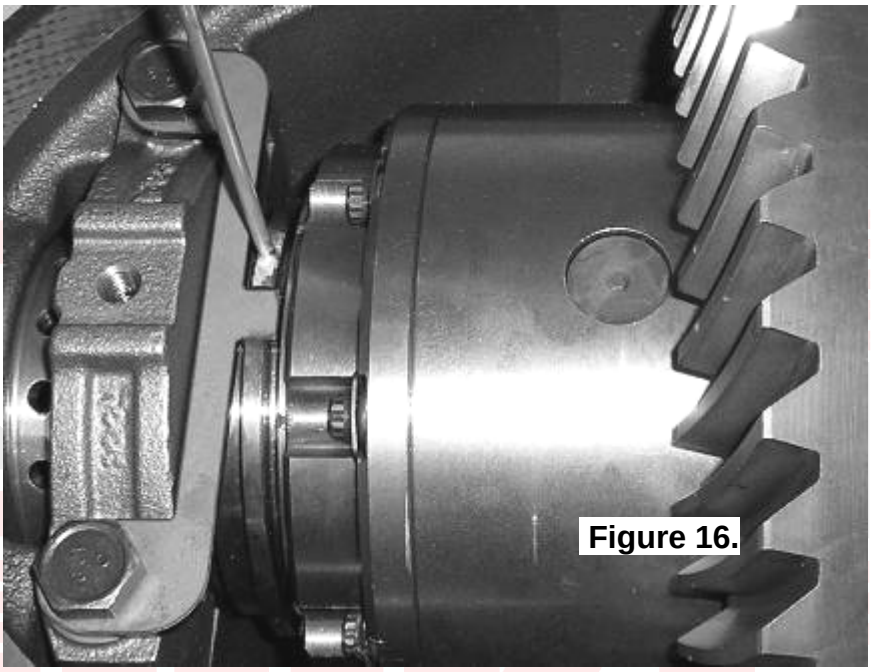


Figure 16.

☐ Insert the bearing cap bolts and finger tighten. It is not necessary to torque them down at this time.

☐ Using the appropriate adjuster nut wrench, lightly hand tighten the seal housing side adjuster nut.

NOTE : **You should feel no backlash between the ring and pinion gears once the adjuster nut tightens.**

☐ Reverse the adjuster nut (counterclockwise) ¼ turn.

☐ Using the adjuster nut wrench, hand tighten the opposite adjuster nut.

NOTE : **You should now feel some backlash between the ring and pinion gears.**

3 Installing the Air Locker

3.7 B Profiling the Seal Housing Tube

☐ Without using sharp jagged tools such as pliers (your hands are the best tool for this job) gently bend the seal housing tube towards the bulkhead port as shown in figure 17.

☐ From this position approximate the length of tube required to pass through the bulkhead port and protrude about 10mm [3/8”]. Trim using an automotive brake line tubing cutter.

NOTE : **To be on the safe side allow a little extra tube in the approximated length as trimming the tube too short could cause the seal housing to be pulled off center.**

NOTE : **Never use a hacksaw to cut the seal housing tube as this will leave metal filings in the air system.**

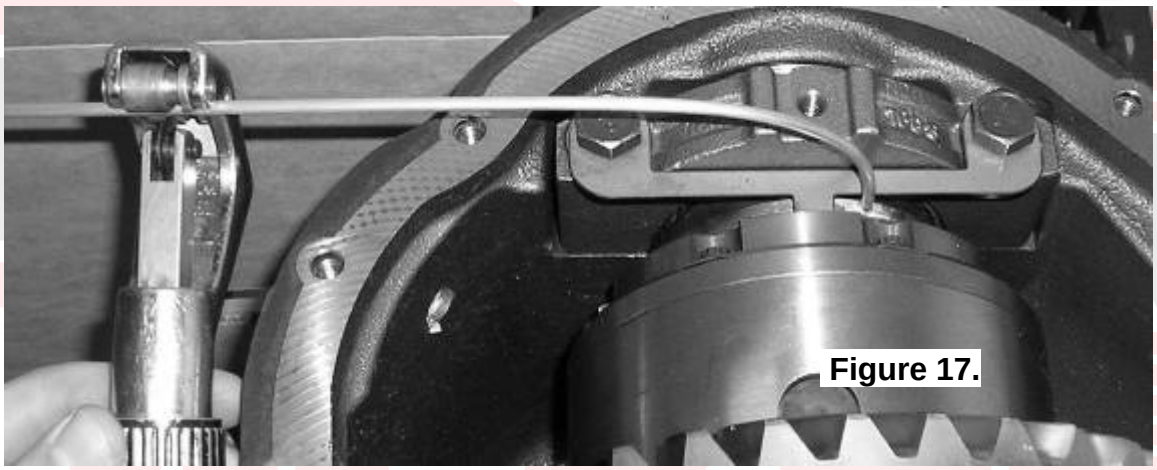


Figure 17.

Figure 18.

Figure 19.

3 Installing the Air Locker

☐ Gently bend the seal housing tube into a profile that protrudes 10mm [3/8”] through the bulkhead port and doesn’t pull at all on the seal housing. (see Fig.18. and Fig.19.)

NOTE : **Ensure there is clearance between the seal housing tube, *Air Locker*, seal housing bracket and cover plate.**

3.8 Checking the Backlash

☐ Set up a depth indicator and measure the backlash as detailed in section 2.5.1 or 2.5.2.

☐ Refer to your vehicle service manual for the specified maximum and minimum amounts of backlash.

IMPORTANT :

It is critical to set up bearing pre-load when a differential is installed. Improper pre-load will result in undue bearing wear, increased stresses in the differential carrier, increased running noise and ultimately, ring and pinion gear damage.

☐ Adjust the backlash and pre-load using an adjuster nut wrench to tighten or loosen the adjuster nuts as required. (Refer to your vehicle service manual.)

☐ Recheck backlash as before, repeating this procedure until backlash is within the specified amount.

☐ Reinstall the adjuster nut locking tabs.

☐ **A** On the “Clamshell” replace the breather.

☐ **B** On the “*Live Axle*” tighten all bearing cap bolts with a torque wrench to the torque specified in your vehicle manufacturer’s service manual.

3.9 Setting Up the Bulkhead Fitting

☐ Apply thread sealant to the threads of the bulkhead body.

☐ Place the bulkhead body over the short length of tube protruding from the housing and screw it into the tapped hole, and tighten.

☐ Wipe the area clean of any excess thread sealant (inside and outside of the housing).

☐ From the outside of the housing, assemble the small O-ring over the top of the short length of seal housing protruding through the bulkhead fitting.

3 Installing the Air Locker

☐ While holding the seal housing tube into the bulkhead fitting, insert the small drilled end of the center compression nut over the extended tube as shown in the assembly diagram (Fig.20.), and screw it into the bulkhead body, and lightly tighten.

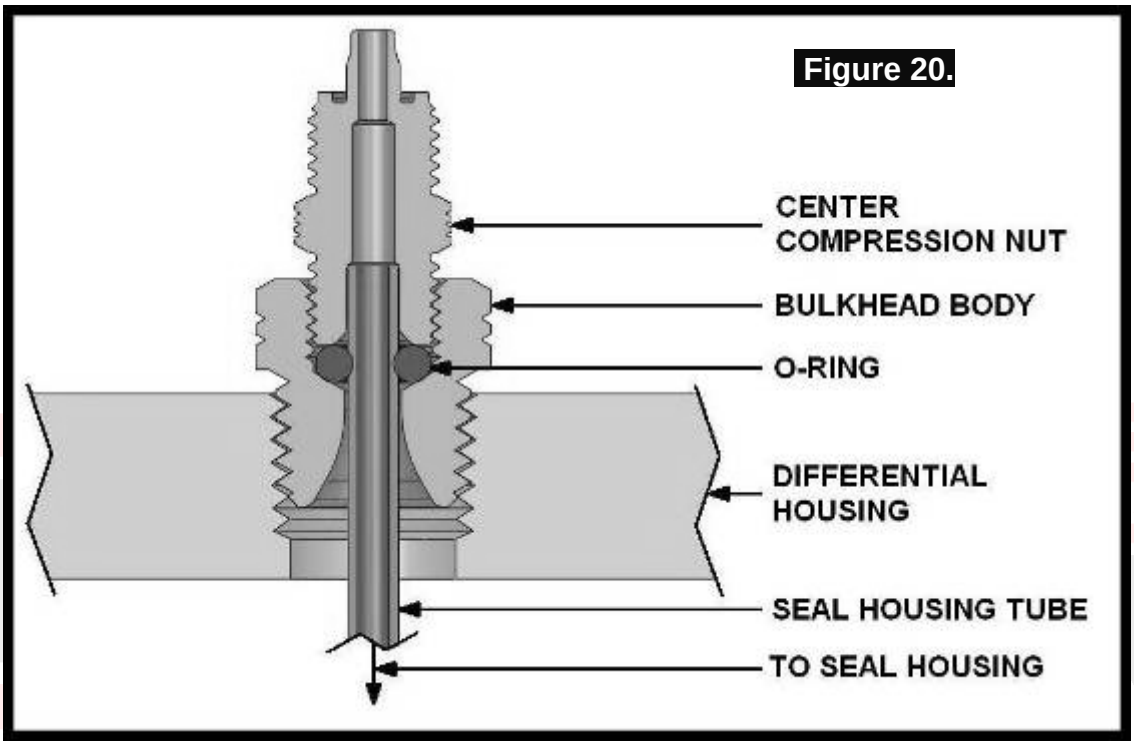


Figure 20.

NOTE : Excessive tightening of the center compression nut is not necessary to form a good seal around the tube and may damage the O-ring, the seal housing tube, or the threads of the compression nut.

NOTE : Make sure the seal housing tube is all of the way into the center compression nut while you are tightening it.

3 Installing the Air Locker

3.10 Reinstalling Differential and Axles

3.10.1 A Reinstalling IFS Housing

- ☐ Reinstall the differential housing into the vehicle.
- ☐ Reconnect the drive shaft to the pinion flange.
- ☐ Reassemble the stub axles and remaining components according to your vehicle manufacturer's service manual.

3.10.2 B Reinstalling Axles

- ☐ Reinstall the axles and torque down the axle bolts according to the manufacturer's specification.
- ☐ Reassemble the remainder of the differential assembly (e.g., hubs, brakes, wheels, etc.) to the vehicle according to your vehicle's service manual.

NOTE : **Be careful not to damage the axle oil seals with the spline of the axle.**

4 Installing the Air System

4.1 Mounting the Solenoid

4.1.1 Connection to an ARB Air Compressor (Fig.21.)

- ☐ Remove one of the 1/8” BSP plugs from its port in the compressor tank.
- ☐ Apply Teflon paste to the nipple (1/8” X 1/8” BSP) and insert it into the port and tighten.
- ☐ Apply Teflon paste to the free end of the nipple.
- ☐ Assemble the inlet port side of the solenoid (stamped with a ‘1’) onto the nipple and tighten. The solenoid should be rotated into a position that does not obstruct any other ports on the compressor tank.

NOTE : **The solenoid exhausts compressed air through the center of the black retaining cap when the *Air Locker* is disengaged. Make sure this orifice cannot be obstructed.**

- ☐ Apply Teflon paste to the threads of the 5mm push-in fitting and assemble it into the solenoid outlet port (stamped “2”) and tighten.

ARB

Air Compressor

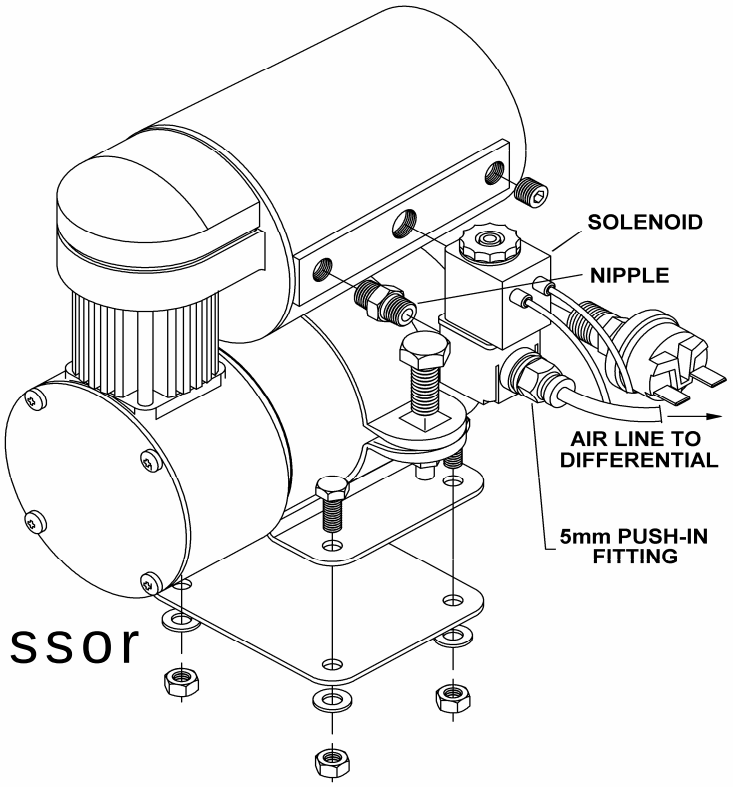


Figure 21.

4.1.2 Connection to an Alternate Air Source

For ease of installation, quality of air supply, and a high level of dependability from your *Air Locker(s)*, ARB strongly recommends use of a genuine ARB Air Compressor, however, the *Air Locker* air system can be operated on any alternate air source that meets each of the following guidelines:

- ☐ Must supply a minimum of 85PSI [586kPa].
- ☐ The supply must never exceed 105PSI [724kPa].
- ☐ The Air source should have a tank capacity that enables it to actuate the *Air Locker*(s) in one charge so that no hesitation is experienced when locking one or two differentials.

HINT : **A good way to insure that you have the necessary capacity is to make sure you can engage, disengage, and then reengage your *Air Locker*(s) without the air source having to regenerate (e.g., without the compressor turning on to refill the tank).**

- ☐ Must supply clean air, free of rust, dirt, water, or other foreign matter.
- ☐ Must match the 1/8” BSP porting of the *Air Locker* solenoid.

☐ Mount solenoid within close proximity of the air supply and secure it from the effects of vibration and shock.

☐ Connect the air supply to the 1/8” BSP inlet port of the solenoid (stamped “1” on the solenoid body) using thread sealant.

IMPORTANT :

ARB cannot warrant your *Air Locker*(s) against damage caused as a result of using an alternate air supply. If you have any doubts as to the suitability of your air system to use in an *Air Locker* system, consult your ARB distributor.

4 Installing the Air System

4.2 Running and Securing the Air Line

The path taken by the air line from your air source (i.e., compressor) to your *Air Locker* is unique to your vehicle and the position of your air source. Plan ahead carefully when running the air line and always follow these guidelines:

- ☐ Account for axle travel when running the line from the axle to a fixed point on the vehicle. Leave enough slack in the air line to allow for maximum suspension travel in both directions. (Not necessary on IFS installations)
- ☐ Avoid leaving large lengths of air line hanging underneath the vehicle where they may get tangled on rocks, sticks, etc.

HINT : **Cable tying the air line to one of your flexible brake lines will account for axle travel and should help keep your line from getting snagged.**

- ☐ Run the air line all the way from the compressor to the differential before trimming either end of the line to length. This will save complications that may arise if the air line has to be removed.
- ☐ Make sure the line does not contact sharp edges or abrasive surfaces that may damage the air line over time.
- ☐ Do not run the air line around tight bends which may kink the air line and restrict or block the air flow.
- ☐ Keep the air line well away from your vehicle's exhaust components. Air lines will melt if subjected to extreme heat.
- ☐ Do not run more air line than necessary. Excess line volume created when coiling the left over hose, using unusually large diameter hose, etc., will increase drain on the compressor tank resulting in the compressor running more often than needed.
- ☐ Support the air line by tying it back with cable ties wherever possible.
- ☐ At the solenoid end of the air line, always trim the line to length with a sharp knife to avoid distorting the tube where it plugs into the push-in fitting.

NOTE : **To remove the air line from the push-in fitting; while holding the flange of the fitting out, push the air line into the fitting as far as possible, then press the flange inward, then pull the air line free of the fitting.**

4 Installing the Air System

☐ To attach the air line to the push-in fitting of the solenoid; insert the line firmly into the fitting, pull outward on the flange of the fitting while holding the line as far into the fitting as possible, and then gently pull outward on the air line to clamp the line in place.

4.3 Connection to the Bulkhead Fitting

☐ In the case of an IFS axle assembly or in the case that the axle assembly has been completely removed from the vehicle, the assembly will have to be remounted in order to position the bulkhead fitting in its correct location for air line access.

☐ Trim the air line to length using a sharp knife.

☐ Insert the support spring over the end of the air line - small end first. (Fig.22.)

☐ Insert the outer compression nut over the air line.

☐ Push the airline onto the barb on that center compression nut, ensuring that it is pushed all the way to the end.

Figure 22.

HINT : **If the tube is too difficult to push on, place the end of the air line into a cup of boiled water to soften the tubing.**

4 Installing the Air System

☐ Screw on the outer compression nut and tighten, while supporting the center compression nut with a 3/8” spanner. The airline is now attached to the center compression nut.

NOTE : **The outer compression nut will tighten against a stop. Over tightening will not create a better seal.**

☐ Assemble the support spring over the outside of the outer compression nut.

☐ Secure any loose sections of tube with a cable tie.

5 Mounting & Connecting the Electrical System

5.1 Mounting the Actuator Switch(es)

Air Locker actuator switch(es) can be easily panel mounted inside the vehicle in a 21mm x 36.5mm [0.83” x 1.44”] rectangular cutout.

NOTE : **Only attach the cover plate to the face of the switch once the switch has been mounted and wired correctly as the cover plates are designed to be difficult to remove.**

For reasons of safety and for ease of operation, the *Air Locker* actuator switch(es) should be mounted in a location picked to best suit the operator. Make sure you have taken the following points into consideration:

- ☐ Switch(es) MUST be mounted and should never be allowed to simply dangle from the wiring loom during vehicle use.
- ☐ Switch(es) should be within easy reach of the driver. Ideally, any *Air Locker* switch should be able to be operated without physical effort or distraction to the driver.
- ☐ Switch(es) should be mounted within the line of sight of the driver so that switch position (‘ON’ or ‘OFF’) can be visually determined by the rocker position and the illumination state.
- ☐ The position of the switch(es) should best eliminate any possibility of accidental operation by the driver or one of the passengers.
- ☐ Switch cutout position(s) must be located in an area with a minimum of 50mm [2”] of clearance behind the face of the cutout.
- ☐ Switch(es) should not be mounted where they will be exposed to water (e.g., in the lower section of an inner door panel).
- ☐ ARB recommends that you apply the *Air Locker* Warning Sticker (ARB part # 210101) within close visual proximity of the switch location.

NOTE : **If no adequate position can be found on existing dashboard panels, a surface mounted bracket (Fig. 23.) may be purchased from your ARB *Air Locker* distributor to suit 1, 2, or 3 switches.**

Figure 23.

5.2 Wiring the Actuator System

5.2.1 Connection to an ARB Air Compressor

When wiring the *Air Locker* actuator switch(es) and solenoid(s) to an ARB Air Compressor, all connections can easily be set up directly from the supplied wiring loom. (Fig.24.)

NOTE : **Refer to your ARB Air Compressor Installation Guide for details on configuring your installation.**

5 Mounting & Connecting the Electrical System

ARB AIR COMPRESSOR WIRING LOOM

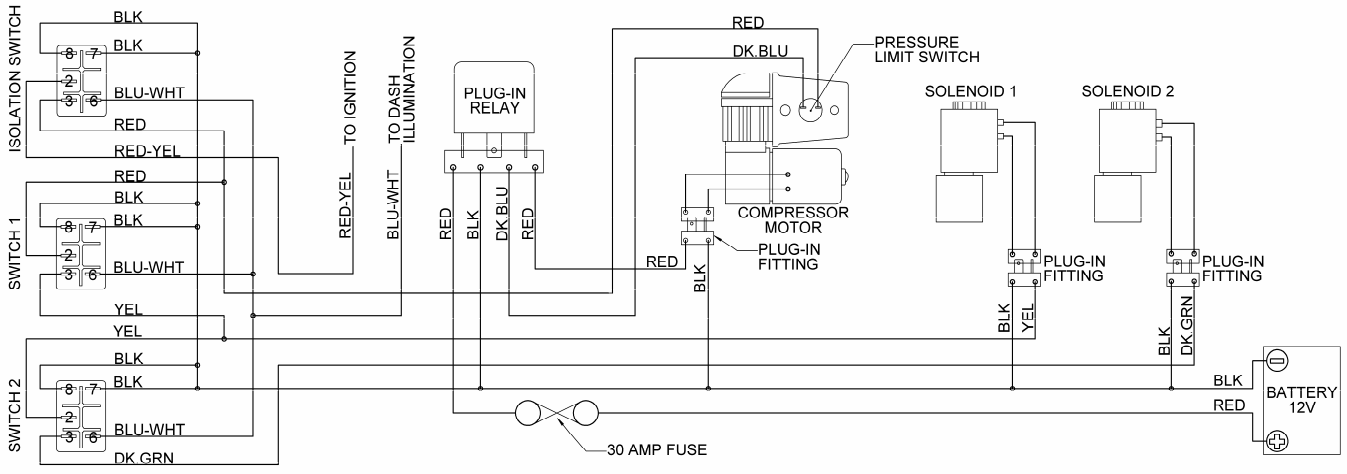


Figure 24.

NOTE : **ARB wiring loom #180405 shown. Consult your compressor installation guide for the diagram to suit your compressor model.**

SWITCH TERMINAL IDENTIFICATION

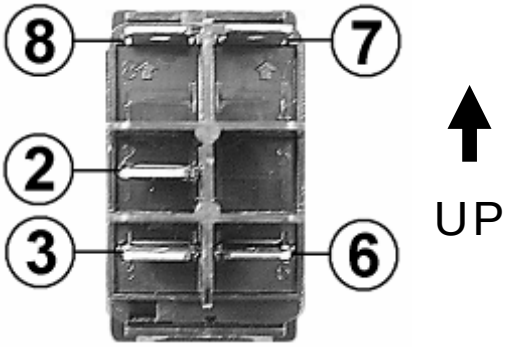


Figure 25.

5.2.2 Connection to an Alternate Air Source

When connecting the actuation switch to an alternate air source, the switch(es) should be wired according to figures 26. and 27., depending on whether one or two *Air Lockers* will be installed in the vehicle.

5.2.2.1 Single Air Locker System

☐ If only one *Air Locker* is to be installed in the system, the switch and solenoid should be wired according to figure 26. regardless of whether the *Air Locker* has been installed in the front or rear axle of the vehicle.

☐ Attach the appropriate switch cover (i.e., 'FRONT' or 'REAR') to the switch.

NOTE : **Refer to Figure 25. for the correct switch terminal identification and switch orientation.**

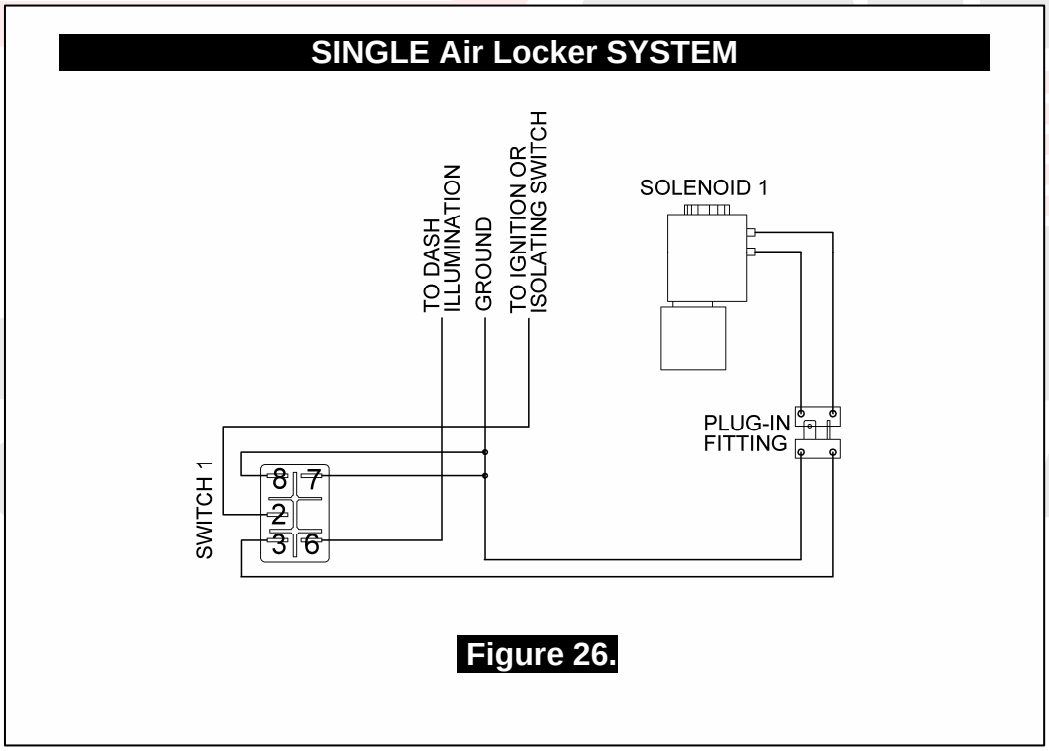


Figure 26.

5.2.2.2 Dual Air Locker System

☐ If two *Air Locker*s are to be installed in the system, ARB recommends that the switches and solenoids be wired according to figure 27. For safety reasons, this configuration allows SOLENOID 2 to be actuated only if SOLENOID 1 is already on.

☐ Attach the “REAR AIR LOCKER” switch cover to SWITCH 1, and the “FRONT AIR LOCKER” switch cover to SWITCH 2.

NOTE : **Refer to Figure 25. for the correct switch terminal identification and switch orientation.**

☐ Configure SOLENOID 1 as the air line leading to the rear axle *Air Locker*, and SOLENOID 2 as the air line leading to the front axle *Air Locker*.

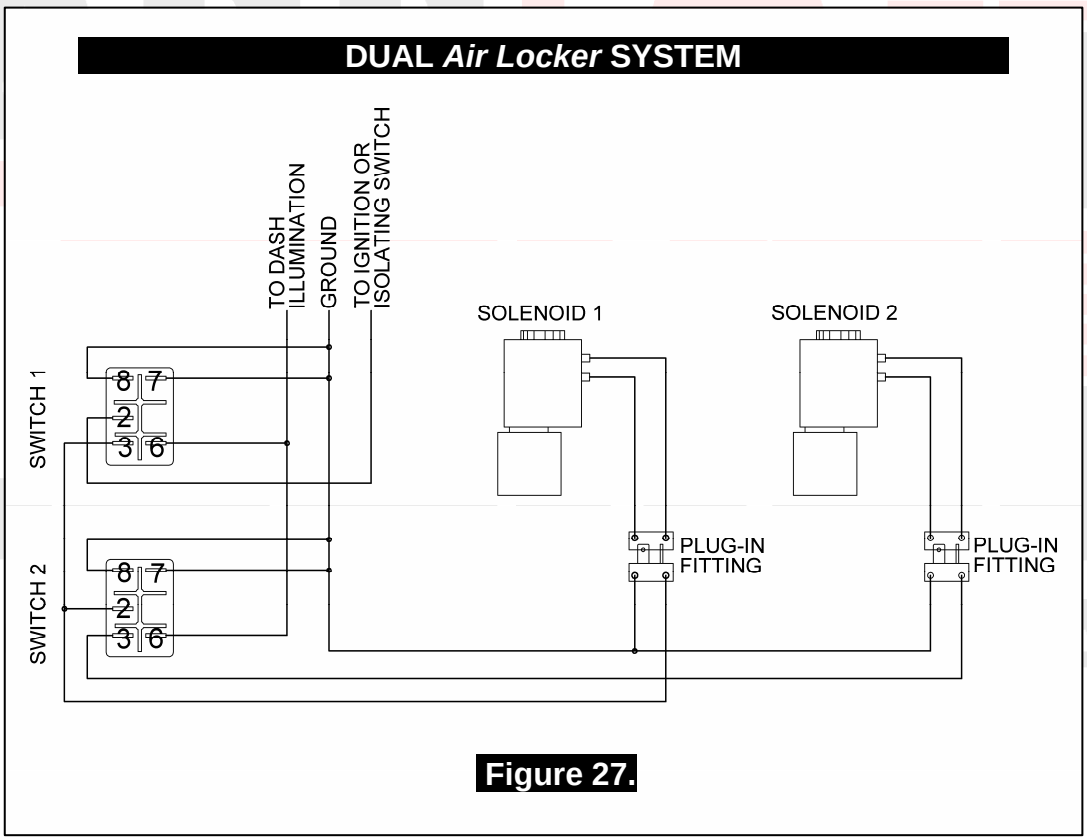


Figure 27.

6 Testing & Final Assembly

6.1 Leak Testing

☐ With the vehicle parked and the engine off, turn the compressor on and wait until the air system is fully charged.

NOTE : **With the *Air Locker(s)* disengaged, the air source (i.e., compressor) should not have to recharge over time. Intermittent recharging without *Air Locker* use usually indicates a leak at the solenoid fittings or at the compressor tank O-ring seal.**

☐ Actuate the *Air Locker*(s).

☐ The compressor should not come on again for a period of at least 15min. Air system recharging within that time period would indicate that a leak is present in the system.

NOTE : **If an alternate air source (e.g., an air cylinder or a belt driven air pump) is used instead of a compressor, the air system will have to be leak tested with a pressure gauge and a shut-off valve in series before the solenoid input.**

☐ If a leak is found to be present, spray a soap and water mixture onto all air fittings in the system while the compressor is fully charged. Bubbles should appear at any leak points.

☐ Check that leaky fittings have been adequately tightened.

☐ Disassemble, clean threads, and reapply thread sealant if leaking persists.

6.2 Testing the Air Locker Actuation

To test that your air system, electrical system, and your *Air Locker* differential is functioning correctly:

- ☐ Support the vehicle such that the wheels are free to rotate (e.g., on axle stands, a chassis hoist, etc.)
- ☐ Leave the parking brake off, the transmission in neutral, and the *Air Locker* switch 'OFF'.
- ☐ Turn the ignition to the 'ON' position (leaving the motor off). The large illuminating symbol on the *Air Locker* switch cover should be 'OFF'.
- ☐ Turn the compressor (or alternate air source) on to charge the air supply up to its maximum pressure.
- ☐ While supporting the drive shaft flange, rotate one wheel by hand.
- ☐ The wheel should rotate freely and the opposite wheel should be turning in the opposite direction without any resistance or mechanical noise from within the differential.
- ☐ Turn the *Air Locker* switch to the 'ON' position. The illuminated symbol on the switch cover should light up.
- ☐ Rotate the same wheel again.
- ☐ Both wheels should rotate together.
- ☐ Turn the switch off again.
- ☐ Rotate the same wheel.
- ☐ The wheels should again rotate in opposite directions.

6.3 Re-Sealing & Filling the Differential

NOTE : **Consult the *ARB Air Locker Operating & Service Manual* for recommendations on differential lubricant specifications.**

- ☐ B On the "*Live Axle*" replace the differential cover using gasket sealant or a new differential cover gasket for your make of vehicle.
- ☐ Refill the differential until level with the filler hole.
- ☐ Rotate the differential center 2 full turns.
- ☐ Check the oil level and add oil if necessary.
- ☐ Replace filler plug (apply thread sealant to filler plug before inserting if it is a threaded type plug).
- ☐ Wipe differential housing clean of any oil or grease which may collect dirt or other abrasive particles.

6 Testing & Final Assembly

6.4 Post-Installation Check List

Now that the *Air Locker* installation has been completed, ARB recommends that you take the time to complete the following check list just to insure that you haven't missed any of the vital steps.

- ☐ The air system has been leak tested.
- ☐ Thread locking compound was used on the ring gear bolts.
- ☐ All torque settings comply with the vehicle manufacturer's specs and were set with an accurate torque wrench.
- ☐ Differential fluid complies with ARB recommendations and has been filled to the correct level.
- ☐ All air lines and wiring have been securely cable tied to resist snagging.
- ☐ Switch(es) have been securely mounted within operator reach, yet well away from danger of accidental engagement.
- ☐ Switch(es) function properly and illuminate to indicate that *Air Locker*(s) are engaged.
- ☐ All operators who are to use the *Air Locker* have read, and fully understand the *ARB Air Locker Operating & Service Manual*.
- ☐ The *Air Locker* Warning Sticker has been located within close proximity of the actuator switch(es).

INSTALLATION PERFORMED BY: _____

DATE OF INSTALLATION: _____

ODOMETER READING: _____

ARB AIR LOCKER SERIAL No: _____

Cutout Template For Positioning Bulkhead Port

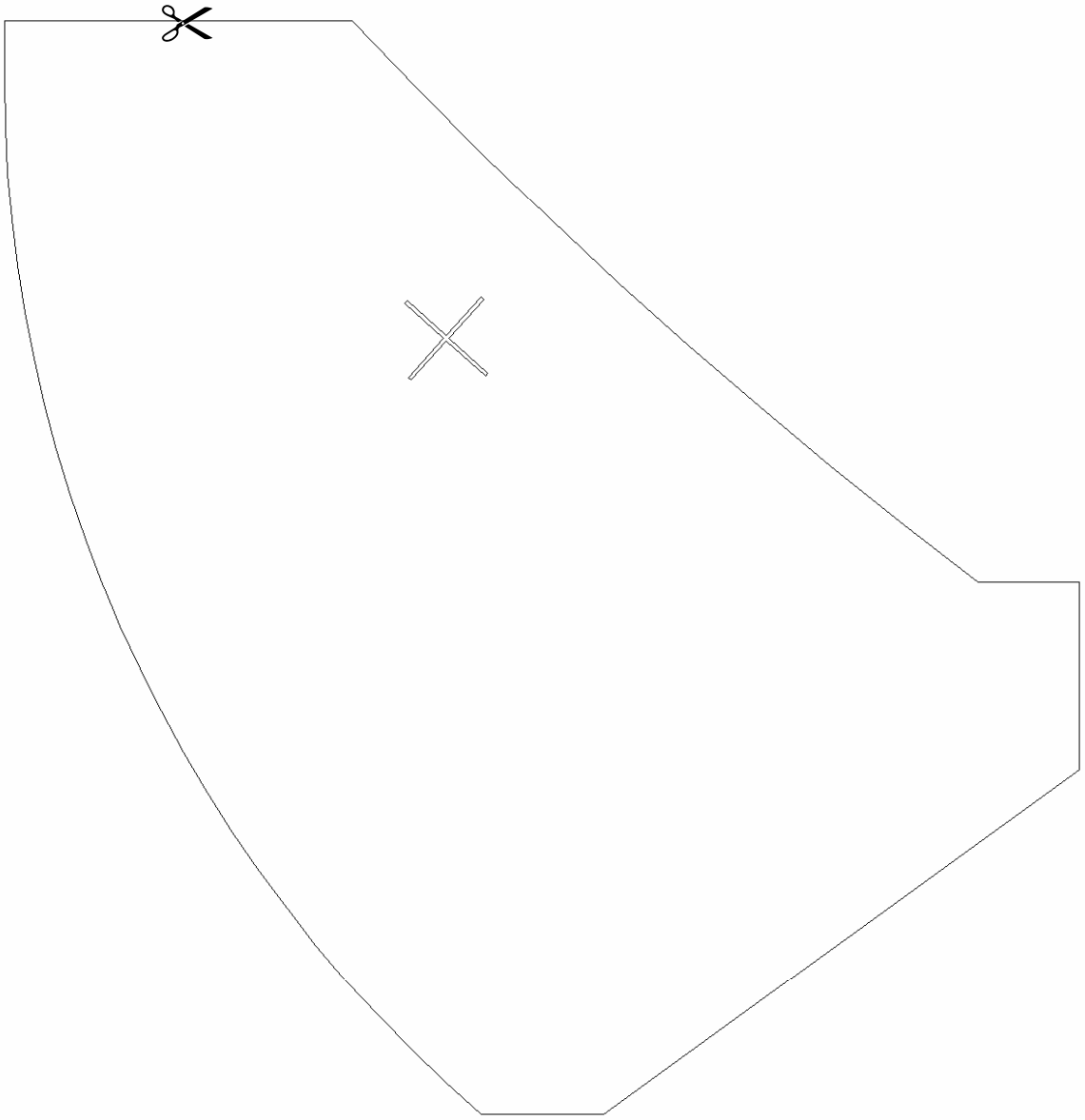
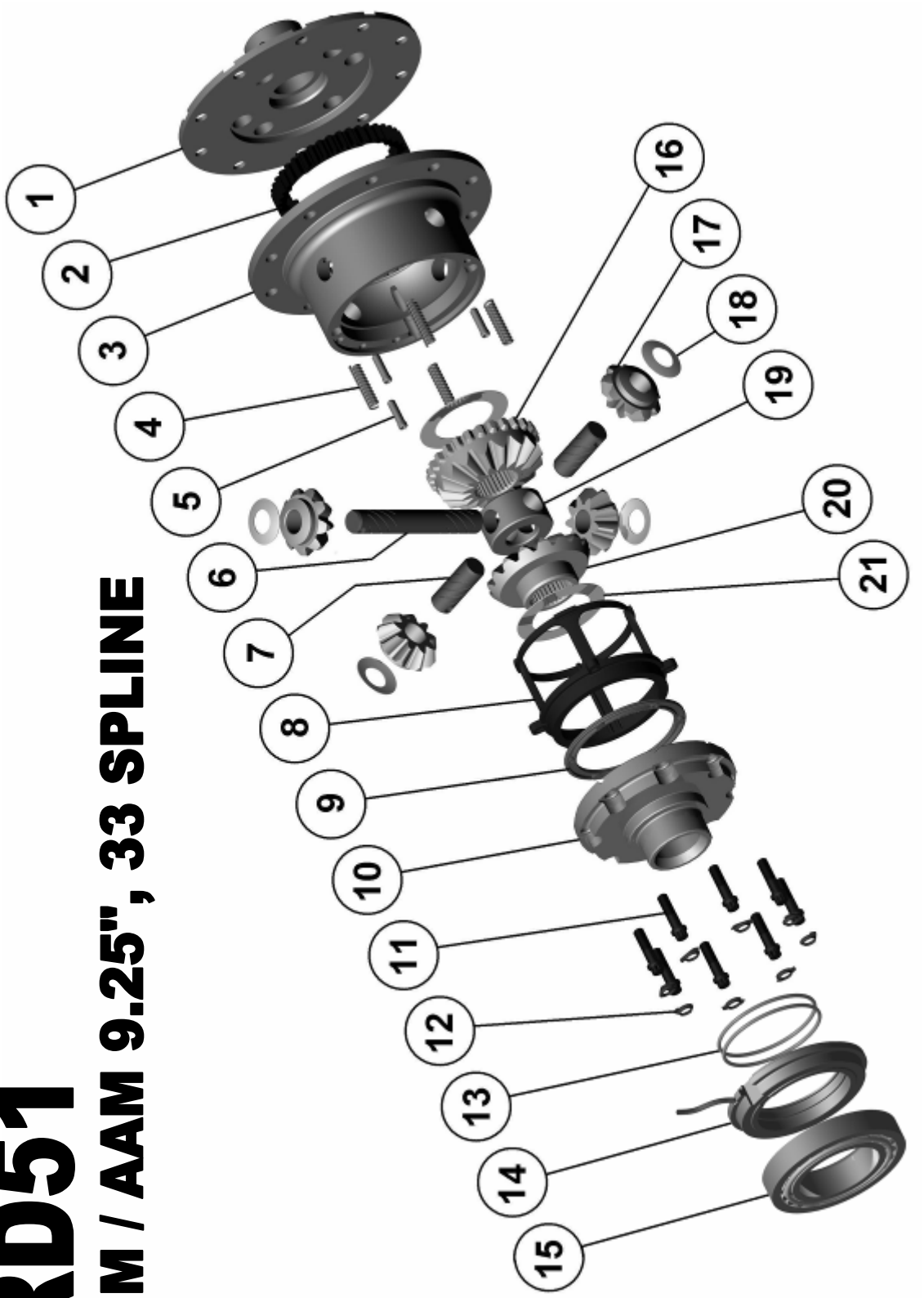


Figure 28.

7 Parts List

7.1 Exploded Assembly Diagram

(See itemized parts list overleaf)



RD51
GM / AAM 9.25", 33 SPLINE

Figure 29.

7 Parts List

7.2 Itemized Parts List

(See exploded diagram figure 29.)

AIR LOCKER MODEL No. : RD51			
ITEM #	QTY	DESCRIPTION	PART #
01	1	FLANGE CAP	022401
02	1	CLUTCH GEAR	050202
03	1	DIFFERENTIAL CASE	012301
04	4	RETURN SPRING	150101
05	3	CROSS SHAFT RETAINING PIN	120303
06	1	LONG CROSS SHAFT	060205
07	2	SHORT CROSS SHAFT	060402
08	1	PISTON	040202
09	1	BONDED SEAL	160705
10	1	CYLINDER CAP	031101
11	8	CYLINDER CAP RETAINING BOLT	200205
12	8	LOCKING TAB (8mm)	150401
13	2	SEAL HOUSING O-RING	160239
14	1	SEAL HOUSING	080903
15	1	TAPERED ROLLER BEARING	NOT SUPPLIED
16	1	SPLINED SIDE GEAR	728A081**
17	4	PINION GEAR	728A081**
18	4	PINION THRUST WASHER	151102
19	1	SPIDER BLOCK	070201
20	1	SIDE GEAR	728A081**
21	2	SIDE GEAR THRUST WASHER	151006
*	1	SEAL HOUSING BRACKET (LIVE AXLE)	220203
*	1	SEAL HOUSING BRACKET (IFS)	220204
*	2	WASHER	4581072
*	1	SOCKET HEAD CAP SCREW (M6 x 16mm)	200208
*	1	BULKHEAD KIT,O-RING TYPE,3.5-5mm	170111
*	1	PUSH-IN FITTING (5mm to 1/8”BSPP)	170201
*	1	AIR LINE (5mm DIA X 6m LONG)	170301
*	1	NIPPLE (1/8” to 1/8” BSPT)	170501
*	1	SOLENOID VALVE (12V)	180103
*	1	SWITCH	180209
*	1	SWITCH COVER (FRONT)	180210
*	10	CABLE TIE	180301
*	1	WARNING LABEL	210101
*	1	BUMPER STICKER	210102
*	1	OPERATING & SERVICE MANUAL	210200
*	1	INSTALLATION GUIDE	210251

* *Not illustrated in exploded view.*

** *Available only as complete 6 gear set*