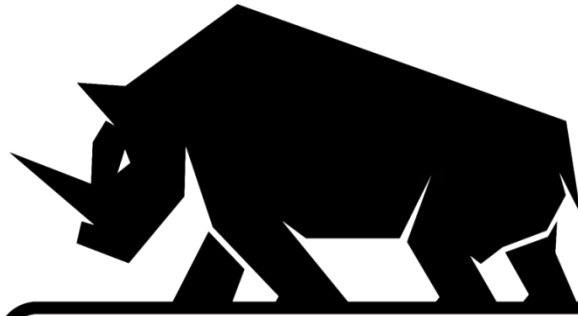


**TRE Air Locker**



***TRE* 4X4**

**AIR LOCKER**  
LOCKING DIFFERENTIAL

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**TRE AIR LOCKER**  
**Installation Manual**

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**TR136**

**NISSAN H233B, 31 SPL**

# CONTENTS

<b>Introduction</b>	<b>3</b>
<b>Installation Preparation</b>	<b>4</b>
<b>A) Tool-Kit Recommendations</b>	<b>4</b>
A-1 Tools	4
A-2 Supplies	4
<b>B) Remove the Original Differential</b>	<b>5</b>
B-1 Support Vehicle by a hoist	5
B-2 Differential Fluid Drain	5
B-3 Removing the axles and Differential	5
B-4 Marking the Bearing Caps	5
B-5 Checking the Current Backlash Amount	6
B-6 Removing the Differential Carrier	7
B-7 Check the thrust block	7
<b>C) Air locker installation</b>	<b>8</b>
C-1 Mounting the Ring Gear	8
C-2 Installing the carrier bearings	9
C-3 Drilling and Tapping the Bulkhead Port	11
C-3-1 Drilling and Tapping For 5mm Air Line	11
C-3-2 Drilling and Tapping For 4mm Oil Return Line	13
C-4 Final Air Locker Assembly	14
C-5 Final Checking the Backlash	15
C-6 Installing the Seal Housing	16
C-7 Setting Up the Bulkhead Fitting	18
C-8 Profiling the Seal Housing Tube	20
C-8-1 Low-pinion Differentials	20
C-8-2 High-pinion Differentials	22
C-9 Bench Testing the Air Locker	23
C-10 Reinstalling the Differential and Axles	24
<b>D) Air System Installation</b>	<b>25</b>
D-1 Mounting the Solenoid	25
D-2 Connection to Air Compressor	26
D-3 Running and Securing the 5mm Air Line and Oil Return Line	27
D-4 Connection to the Bulkhead Fitting (5mm Oil return Line)	28
D-5 Connection to the Bulkhead Fitting (4mm Oil return Line)	29
D-6 Mounting the Actuator Switch(es)	30
<b>E) Mounting &amp; Connecting the Electrical System</b>	<b>31</b>
E-1 Mounting the Actuator Switch(es)	31
E-2 Wiring the Actuator System	31
<b>F) Testing &amp; Final Assembly</b>	<b>33</b>
F-1 Leak Testing	33
F-2 Testing the Air Locker Actuation	33
F-3 Re-Sealing & Filling the Differential	34
F-4 Post-Installation Check List	34
<b>Attention</b>	<b>36</b>
<b>Parts List</b>	<b>38</b>

# Introduction

TRE Air Locker designed for traction assistance. It's a driver-controlled differential when additional traction is required. Driver turn on the control button Locking in both axle deliver equal traction to wheels to providing 100% traction.

TRE Air Locker tested by various Pro 4x4 Races.

Available Terrain: snow, sand, muddy, rocky, etc.

## Common use of TRE Air Locker

When you need more traction, turn on the air compressor first before get close to extraordinary terrain, then turn on the Air Locker switch. (ATTENTION: Turn on the rear Air Locker first, we don't suggest you use front Air Locker alone) After passing, press the switch again and the Air Locker will return to normal mode.

Do not turn on the Air Locker when the wheel is Idling, it will break the locking device.

When you turn off TRE Air Locker, the Air Locker is same as Differential, don't worry about any control problem .

**Note: Place a (X) mark inside each of the (O) symbols as you complete each step. It is very important NOT to miss any of the steps!**

# Installation Preparation

## A) 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 our vehicle service manual for additional recommendations.

### A-1. Tools

- Standard automotive sizes (metric and/or imperial) of sockets, wrenches, Allan keys, and drills.
- A dial indicator or other suitable measuring tool for checking ring & pinion backlash.
- An adjuster-nut pliers
- A razor knife to cut the nylon tubing.
- A torque wrench (See vehicle service manual for required torque range.).
- A lubricant drain reservoir.
- An 11.2mm [7/16"] drill and 1/4" NPT tap for bulkhead fitting installation.
- An 8.5mm drill and 1/8" NPT tap for bulkhead fitting installation.
- An automotive bearing puller or a differential carrier bearing puller.
- A bearing press or arbor press.
- A soft hammer (e.g. copper/rawhide/nylon etc.)

### A-2. Supplies

- Thread lubricant/sealant compound for pressure fittings. (e.g. LOCTITE #567 Teflon paste)
- Thread locking compound (e.g., LOCTITE #272)
- Retaining compound (e.g. LOCTITE #609)
- A gasket sealant or replacement gasket for your third member.
- A sufficient volume of differential oil to completely refill your housing (see the TRE Air Locker Operating and Service Manual for recommended lubricants)
- A soap and water mixture to test for air leaks.

## **B) Remove the Original Differential.**

### **B-1. Support Vehicle by a hoist**

### **B-2. Differential Fluid Drain**

This is a good time to check for metal particles in your oil and in the bottom of the housing which may indicate a worn bearing or differential component.

### **B-3. Removing the axles and Differential**

- Remove the axles according to your vehicle's service manual.
- Disconnect the drive shaft from the flange of the differential.
- Remove the third member from the differential housing. Refer to your vehicle's service manual.

#### **IMPORTANT:**

**TRE strongly recommends that you have your axle assembly inspected for concentricity and straightness before installing your Air Locker.**

### **B-4. Marking the Bearing Caps**

- Using a small 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.1.)
- Mark the right hand cap in a similar way.

**HINT : Many installers choose to make one punch mark on the left hand side of the left hand bearing cap and a similar 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**



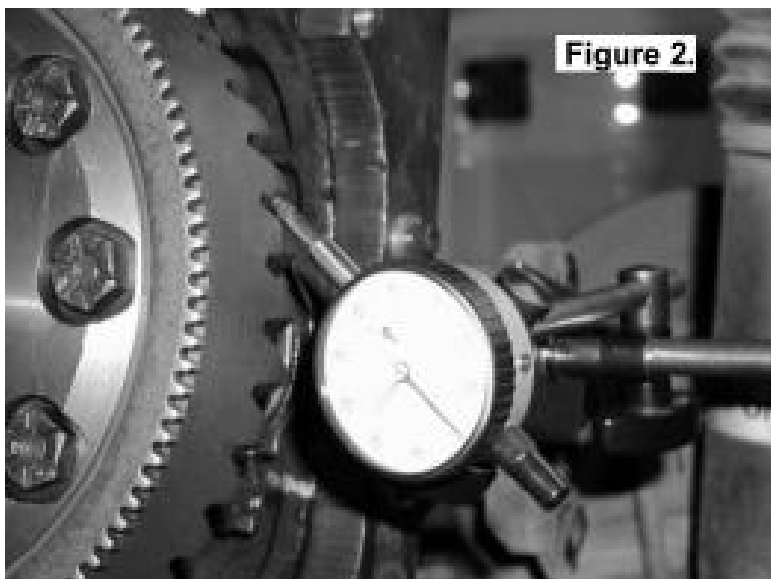
## B-5. Checking the Current Backlash Amount

### **IMPORTANT:**

This step is a precautionary measure recommended by TRE due to the fact that some aftermarket ring and pinion sets have been manufactured to run with different backlash settings than those specified by your vehicle manufacturer. Although TRE must recommend you set backlash according to your service manual guidelines, we also advise that you compare the backlash measurements taken here to there commended 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 TRE installer for more information.

- Set a depth indicator on one of the ring gear teeth as in Figure2.



- While supporting the pinion gear by holding the drive 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.

### **B-6. Removing the Differential Carrier**

- Remove the adjuster nut locking tabs.
- Remove the bearing caps from the third member.
- Remove the adjuster nuts.
- Carefully remove the differential carrier from the third member.

**HINT : Check the condition of the bearings for wear and replace if necessary.**

### **B-7. Check the Thrust Block**

As this Air Locker has been designed to cover a range of Nissan applications, some installations may require a floating thrust block (supplied) to be inserted into the diff center. If you are unsure whether this applies to you, look down the splines of the OE diff you have removed from the vehicle to see if a thrust block used to maintain axle end float is present.

- Remove the flange cap and splined side gear from the Air Locker.
- Insert the thrust block into the center of the diff.
- Replace the splined side gear and flange cap.

**HINT : You can use a thick grease to help to hold the thrust block in place during installation.**

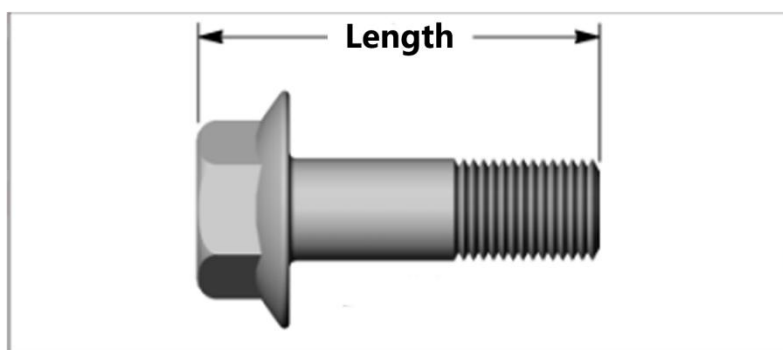
## C) Air locker installation

### C-1. Mounting the Ring Gear

#### IMPORTANT:

There are two different bolts for Nissan differential. Measure the length of the bolts you removed. If it's 31.5mm [1.24 " ] bolts(Nissan part # 3810212S00). If it's longer than 31.5mm [1.24 " ], then you will need to use the spacers under the bolt heads to prevent the threads from bottoming out, or acquire suitable bolts from Nissan.

#### DO NOT MODIFY RING GEAR BOLTS!



- Remove the bolts that hold the ring gear in place.
- Using a plastic or copper hammer, tap in a circle around the ring gear to separate it from the differential carrier
- 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 of the ring gear and the Air Locker flange.

**NOTE : Rubbing the ring gear mounting face with a flat oil stone before installation will remove any high spots around the threads.**

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



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

- Dry the ring gear with compressed air (if wet), paying particular attention to the threaded holes.
- Apply a thin film of high-pressure grease to the ring gear shoulder of the Air Locker to prevent seizing
- Install the ring gear onto the Air Locker by aligning the holes in the flange with the tapped holes in the ring gear, then gently tapping it around in a circle with a plastic or copper hammer.

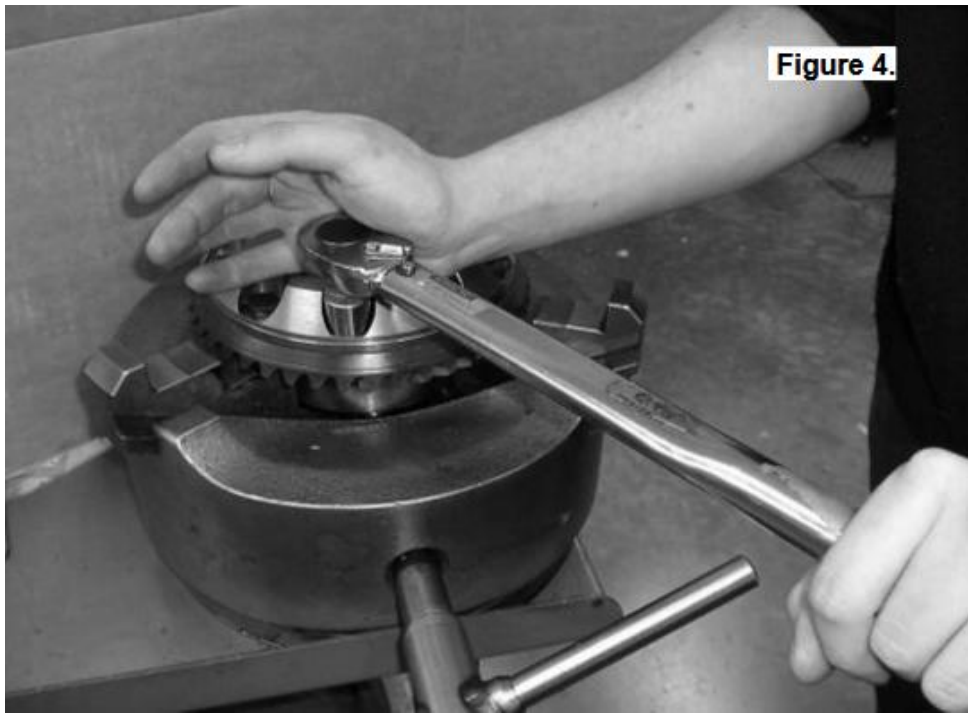
**NOTE : Avoid using the bolts to pull down the ring gear as this puts excess strain on the bolts and the differential flange.**

- Apply a thread locking compound to the thread of each ring gear bolt before inserting it.

**NOTE : Do not apply threading compound directly into the threaded hole as this could prevent the bolt from reaching its full depth.**

**NOTE : On some models, the crown wheel bolts cannot be reused and should therefore be replaced. Refer to your vehicle manufacturer's service manual for details.**

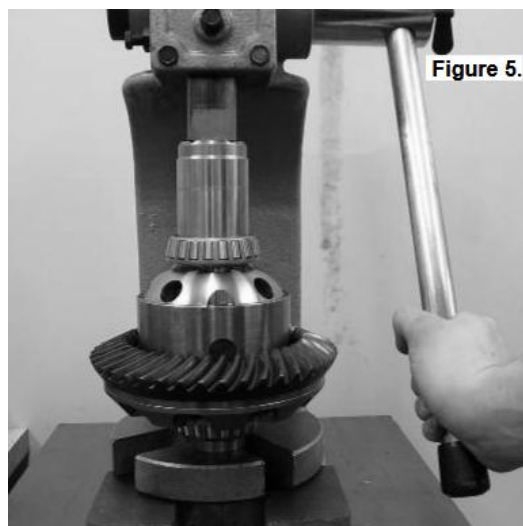
- Tighten the ring gear bolts in a star pattern with a torque wrench according to your vehicle manufacturer's specified torque.



## C-2. Installing the Carrier Bearings

**NOTE :** The Air Locker has been designed to employ higherrated 50mm carrier bearings, instead of the 45mmcarrier bearings used on the OE Nissan diff center. Due to this it is not possible to re-use the original bearings, please use the 50mm bearings equipped in Air Locker box :

- Apply a thin film of high pressure grease to the bearing journals of the Air Locker, then press the bearing cones onto the bearing journals as shown in Figure5.



**Note : Never re-use any bearings which are damaged or worn.**

### **C-3. Drilling and Tapping the Bulkhead Port**

An air line port must be drilled and tapped through the differential housing to mount the bulkhead fitting into. For low-pinion differentials follow instruction “①” . For high-pinion differentials follow instruction “②” .

#### **C-3-1. Drilling and Tapping the Bulkhead Port For 5mm Air Line**

##### **①. Low-Pinion Differentials**

- Mark a spot on the right hand side (opposite the ring gear) toward the top of the differential housing that is in an area well clear of the differential, the ring gear, and any other obstructions that could snag the seal housing tube. (Fig.6.)

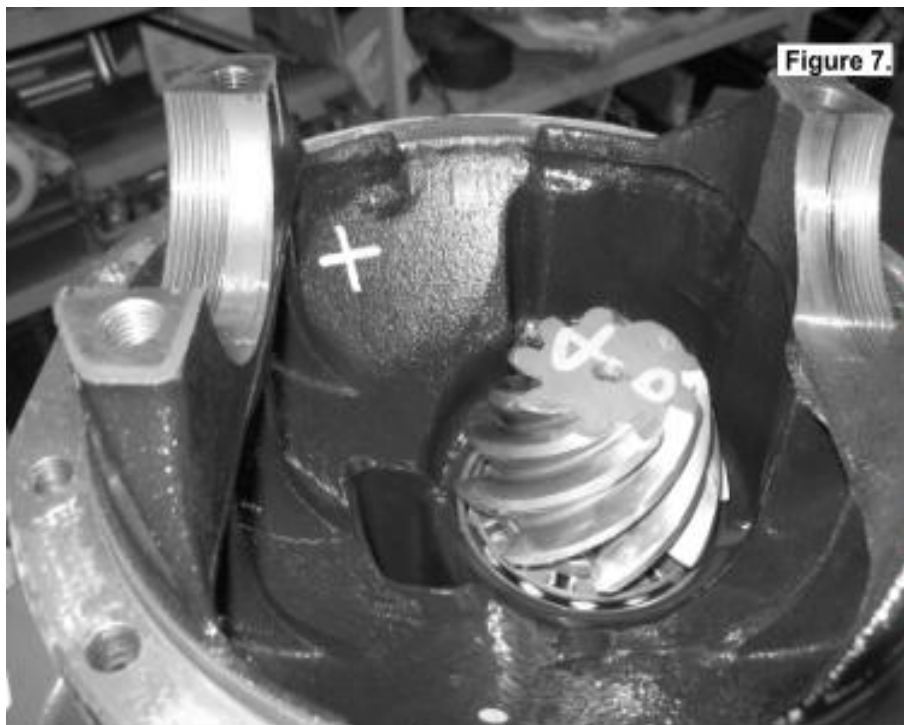


- Cover the drive pinion area with a rag to protect it from metal filings.

- Secure the Differential housing to a work bench.
- Drill an 11.2mm [7/16] diameter hole through the Tube square to the outside surface.
- Tap the hole from the outside using ¼”NPT thread tap.
- Remove any sharp edges that may chip off from around the hole and fall into the tube.
- Thoroughly clean the differential housing to remove any filings from drilling.

## ②. High-Pinion Differentials

- Mark a spot on the inside of the differential housing on the ring gear side in the position shown.(Fig.7.) Ensure that the hole will be clear of the rib on the outside.



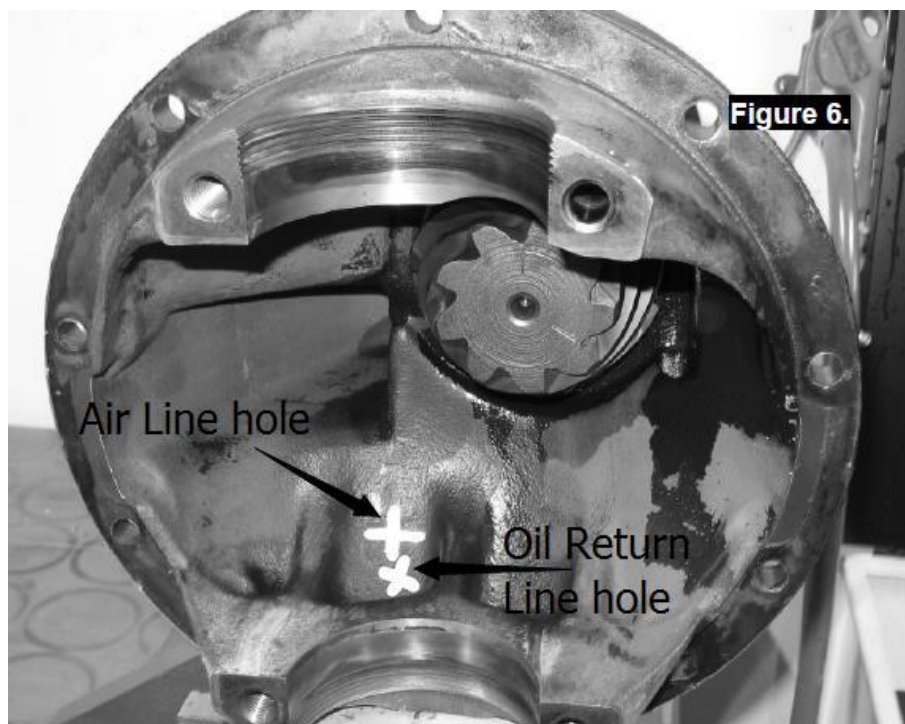
- Cover the drive pinion area with a rag to protect it from metal filings.
- Secure the differential housing to the work bench.
- Drill an 11.2mm [7/16” ] diameter hole through the differential housing square to the inside surface.
- Tap the hole from the outside using ¼” NPT thread tap.
- Remove any sharp edges that may chip off from around the hole and fall into the housing.
- Thoroughly clean the differential housing to remove any filings from drilling.

## C-3-2. Drilling and Tapping the Bulkhead Port For 4mm Oil Return Line

An Oil return line port must be drilled and tapped through the differential housing to mount the bulkhead fitting into Oil return line is designed for protect your air compressor from the differential oil when disengage the air locker, and eliminate the differential loss.(this hole aim to send the differential oil back)

### ①. Low-Pinion Differentials

- Mark a spot on the right hand side (opposite the ring gear) toward the top of the differential housing that is in an area well clear of the differential, the ring gear, and any other obstructions that could snag the seal housing tube. This location should be beside the air line hole.

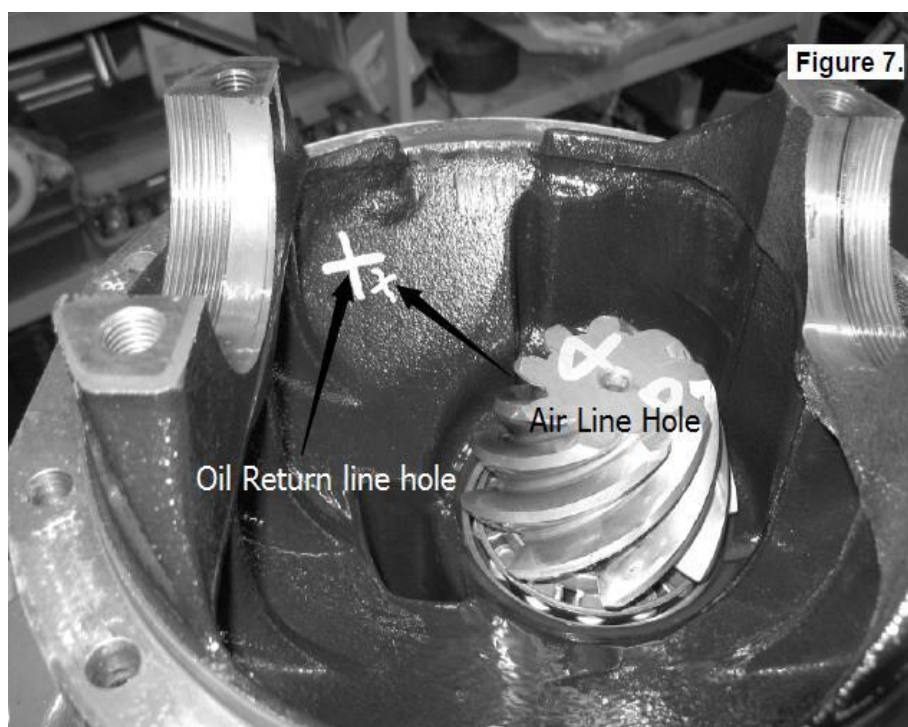


- Cover the drive pinion area with a rag to protect it from metal filings.
- Secure the Differential housing to a work bench.
- Drill an 8.6-8.7mm diameter hole(use a 8.5mm drill) through the housing square to the outside surface.

- Tap the hole from the outside using ½” NPT thread tap.
- Remove any sharp edges that may chip off from around the hole and fall into the tube.
- Thoroughly clean the differential housing to remove any filings from drilling.

## ②. High-Pinion Differentials

- Mark a spot on the right hand side (opposite the ring gear) toward the top of the differential housing that is in an area well clear of the differential, the ring gear, and any other obstructions that could snag the seal housing tube. This location should be beside the air line hole.



- Cover the drive pinion area with a rag to protect it from metal filings.
- Secure the Differential housing to a work bench.
- Drill an 8.6-8.7mm diameter hole(use a 8.5mm drill) through the housing square to the outside

### C-4. Final Air Locker Assembly

- Clean all parts of the differential assembly making sure it is free from any contaminants (e.g., dirt, water, metal fillings, etc.)
- Holding the bearing cups in position, place the Air Locker into the differential housing and

install the bearing caps.

**NOTE : Be sure to check that the bearing caps are on the correct sides of the third member and are correctly aligned**

Insert the bearing cap bolts and hand tighten.

**NOTE : Before attempting to install the adjuster nuts, make sure the threads on the inside of the bearing caps and differential housing are perfectly aligned. If they are not, the threads could be stripped**

Insert and lightly hand tighten the adjuster nut supplied with the Air Locker kit into the ring gear side bearing cap

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

Reverse the adjuster nut (counterclockwise)  $\frac{1}{4}$  turn

Insert the original adjuster nut on the opposite side of the differential and tighten with the appropriate adjuster nut wrench.

Insert the bearing cap bolts and hand tighten.

**NOTE : You should now feel some backlash between the ring and pinion gears. If not, there might be a clearance problem which is binding the carrier. Re-check the clearance.**

### **C-5. Final Checking the Backlash**

Set a depth indicator on one of the ring gear teeth (Fig.8.).

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

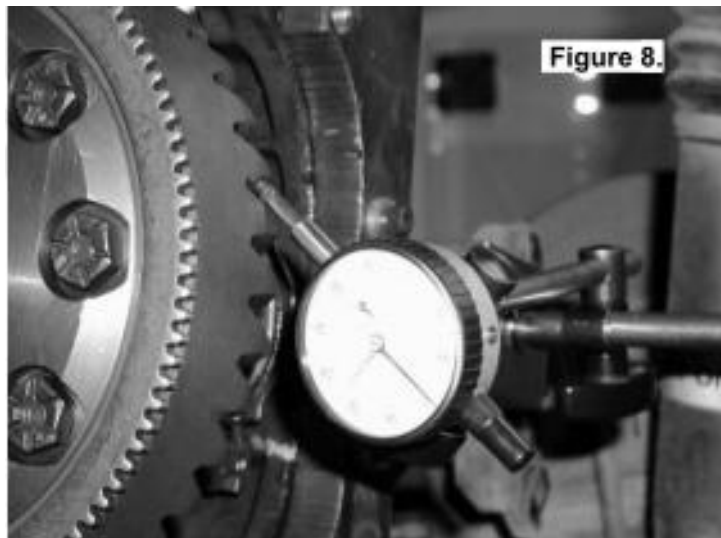
highest value minus the lowest value). This value is referred to as the ring and pinion backlash.

- Rotate the differential center 90° and measure again for accuracy.
- 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 center, 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.
- Tighten the bearing cap bolts with a torque wrench to the torque specified in your vehicle manufacturer's service manual.



### **C-6. Installing the Seal Housing**

- Make sure the grooves and airway of the seal housing are clean and free from any contaminants



(e.g. water, dirt, metal filings, etc.).

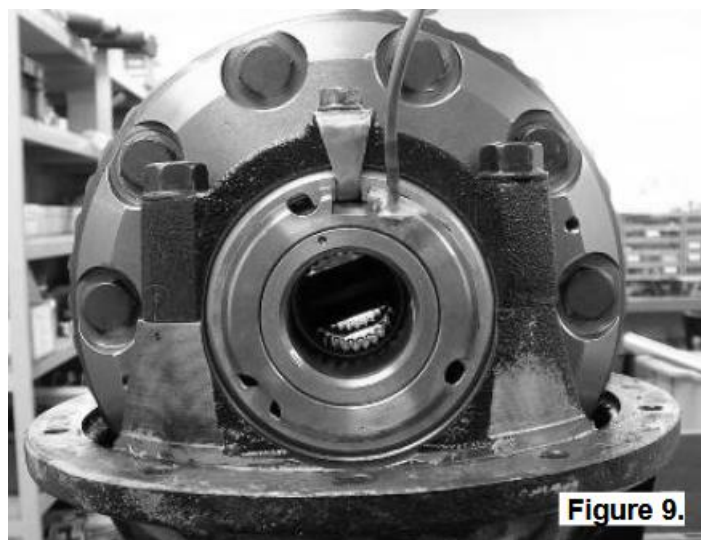
- Inspect the seal housing O-rings (supplied) for dirt, damage or other conditions which might cause leaks.
- Generously lubricate the O-rings with oil prior to assembly, then insert them into the grooves of the seal housing

**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 until it sits flat against the adjuster nut.

**NOTE : A twisting motion (i.e., a slight rotation while pressing the seal housing on) will allow the O-rings to engage gently and prevent them from twisting. Twisted O-rings will result in pre-mature O-ring wear and oil contamination in the air system due to the helical shape formed by the O-ring mould line.**

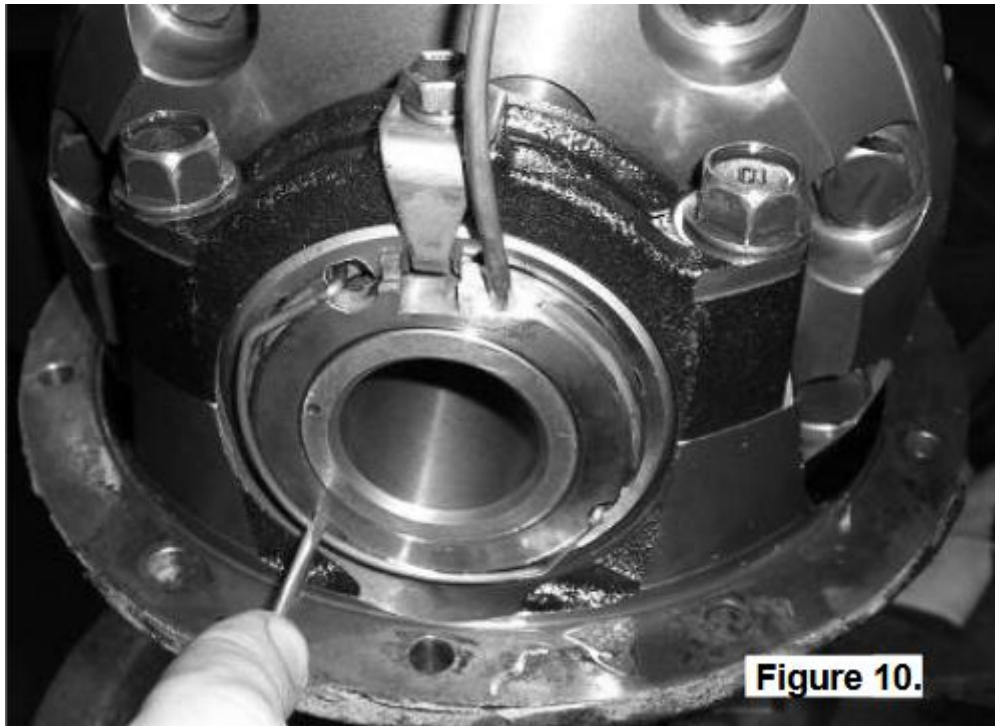
- Rotate the seal housing until the square cutout lines up with the locking tab position at the center of the bearing cap, and then assemble the locking tab. (Fig.9.) Ensure adequate clearance between tab and cutout.



**Figure 9.**

- Install the spring clip by first hooking both ends of the clip into the small aligned cutouts of the seal housing and the adjuster nut, and then snapping the clip into the groove of the seal

housing using a screw driver. (Fig.10.)



- Check that the seal housing is now secured from rotating and that it is still sitting flat against the adjuster nut.

### **C-7. Setting up the Bulkhead Fitting**

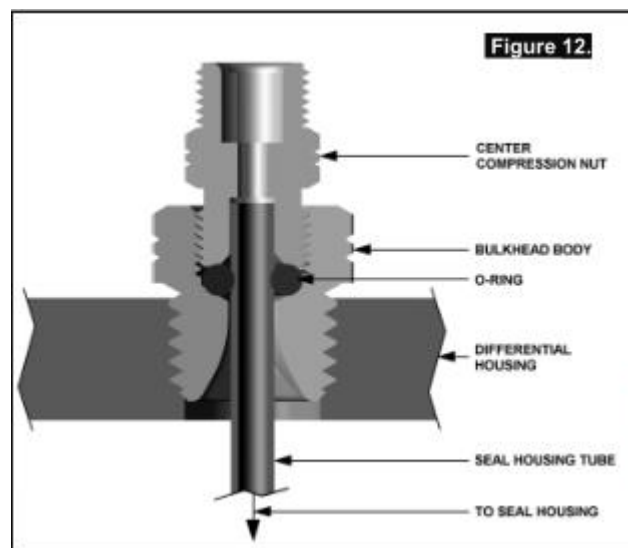
- Apply thread sealant to the threads of the bulkhead body.
- Screw the bulkhead body into the tapped hole, and tighten.
- Wipe the area clean of any excess thread sealant (inside and outside of the housing).
- Without using sharp, jagged tools such as pliers (your hands are the best tool for this job), bend the seal housing tube on the outside of the housing to approximate the finished profile. This will allow the tube to be trimmed to a length that would allow it to protrude from the bulkhead fitting. (See Fig.11.) .

### **IMPORTANT:**

**The seal housing must still be able to freely float after the tube is connected to the bulkhead fitting. Therefore, it is critical to ensure that the tube is not under any tension. To avoid this always leave the tube long enough so that a hook shape can be formed between the seal housing and the bulkhead.**



- From the inside of the housing, insert the trimmed tube into the bulkhead.
- From the outside of the housing, assemble the small O-ring over the top of the short length of seal housing tube protruding through the bulkhead fitting (Fig.12.).
- 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.13.), and screw it into the bulkhead body, and lightly tighten.



**Note :** Be sure to insert the correct end of the center compression nut into the bulkhead body. The thread has been partially relieved on the bulkhead side of the center compression nut to visually identify its orientation. (Fig.12.)

**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.**

## **C-8. Profiling the Seal Housing Tube**

### **C-8-1 A Low-pinion Differentials**

- With the seal housing tube now firmly secured into the bulkhead fitting, bend the tube so that it closely follows the profile of the differential. (Figs.13.,14., & 15.)
- Check that the contour of the tube will not interfere with the bearing caps, the Air Locker, the ring gear or the axle housing. Ensure at least 8mm (5/16" ) clearance between the seal housing tube and the Air Locker.





Figure 14.



Figure 15.

### **IMPORTANT:**

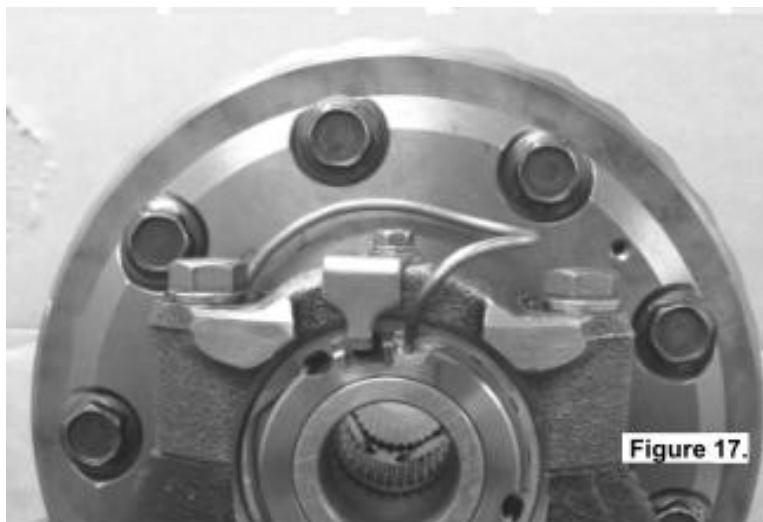
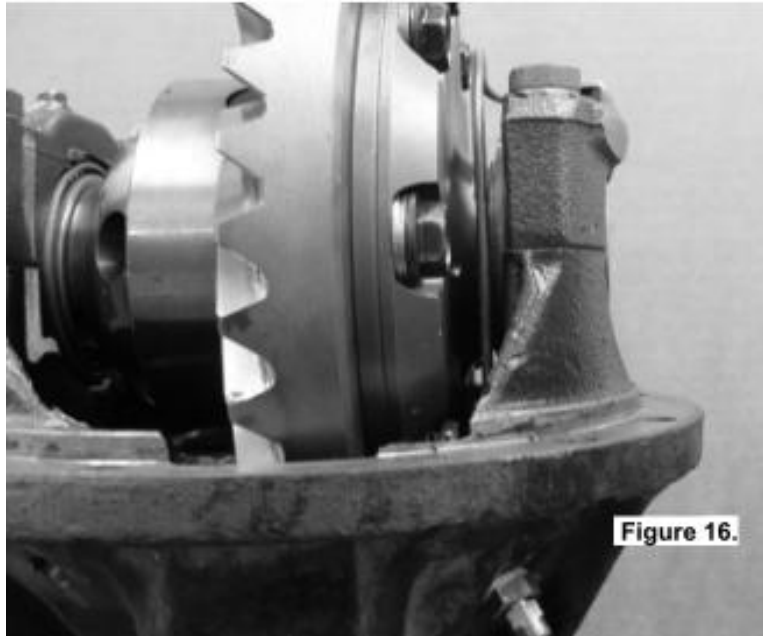
In order for the seal housing to float and self center on the bearing journal, the seal housing tube must not be pulling against the seal housing. To check this, rotate the drive flange back and forth while observing the seal housing movement. The seal housing should rotate slightly against the spring clip, but it should not appear to pull away from the face of the adjuster nut.

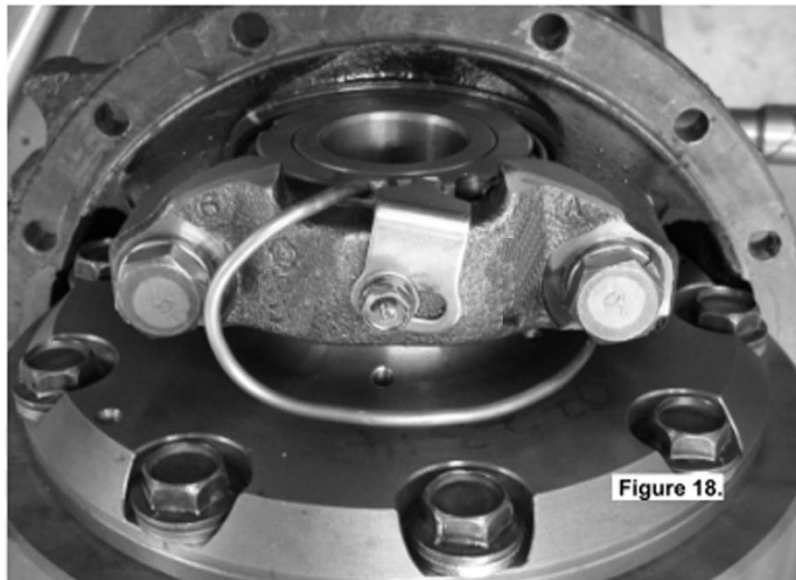
## IMPORTANT:

Check that the tail of the adjuster nut locking tab does not push on the seal housing. Bend it up away from the seal housing with a screw driver if necessary.

### C-8-2 B High-pinion Differentials

- With the seal housing tube now firmly secured into the bulkhead fitting, bend the tube so that it closely follows the profile of the differential. (Figs.16., 17., & 18.)
- Check that the contour of the tube will not interfere with the bearing caps, the Air Locker or the ring gear.





### **IMPORTANT:**

In order for the seal housing to float and self center on the bearing journal, the seal housing tube must not be pulling against the seal housing. To check this, rotate the drive flange back and forth while observing the seal housing movement. The seal housing should rotate slightly against the spring clip, but it should not appear to pull away from the face of the adjuster nut.

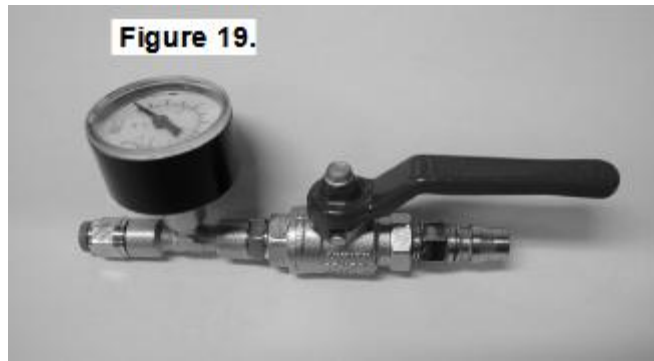
### **IMPORTANT:**

Check that the tail of the adjuster nut locking tab does not push on the seal housing. Bend it up away from the seal housing with a screw driver if necessary.

## **C-9. Bench Testing the Air Locker**

- To test the Air Locker; when 620kPa [90 PSI] shop air is applied to the seal housing tube, the Air Locker should engage.
- Check all fittings and the seal housing for air leaks.
- Rotate the differential carrier by turning the pinion flange whilst applying air pressure.

**NOTE :** An accurate way to test for air leaks is to fit a shut-off valve to an air pressure gauge. Once 620 KPA [90 PSI] is reached close the valve, disconnect the air hose, and watch to see if there is any drop in pressure. If so, this will indicate an air leak.(Fig.19.)



- If a leak is found to be present, spray a soap and water mixture onto the bulkhead air fitting. Bubbles should appear at any leak points.

**NOTE : Do not spray this soapy mixture inside the differential.**

- Check that leaky fittings have been adequately tightened.
- Disassemble, clean threads, and reapply thread sealant if leaking persists.
- If a leak is found at the seal housing, carefully remove the seal housing assembly and examine the O-rings. Be very careful with the O-rings and check for defects, damage, wear, or presence of foreign material in the O-ring grooves. Replace if necessary.

## **C-10. Reinstalling the Differential and Axles**

- Replace the paper gasket on the axle housing flange
- Reinstall the third member to the differential housing according to your vehicle service manual.
- Reinstall the drive shaft.
- Replace the axle seals if necessary and fit to the axles.
- Insert both axles fully into the housing, engaging splines, and then gently tap them inward.

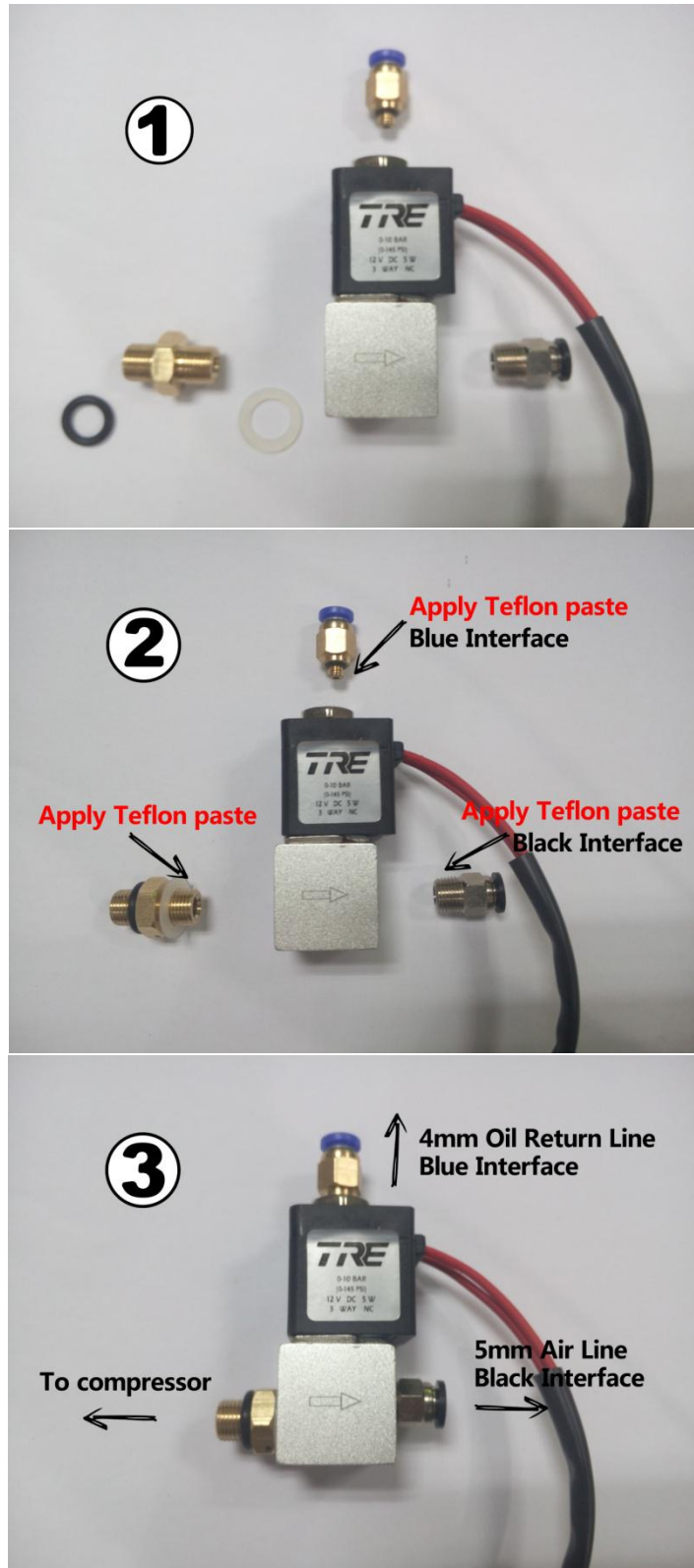
**NOTE : Be careful not to damage the axle shaft oil seals when installing the axle. Support the axle's entire weight where possible.**

- Torque down the axle bolts to manufacturer's specifications



## D) Air System

### D-1. Mounting the Solenoid



## D-2. Connection to Air Compressor

- 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 (opposite arrow side) onto the nipple and tighten.  
The solenoid should be rotated into a position that does not obstruct any other ports on the compressor tank.

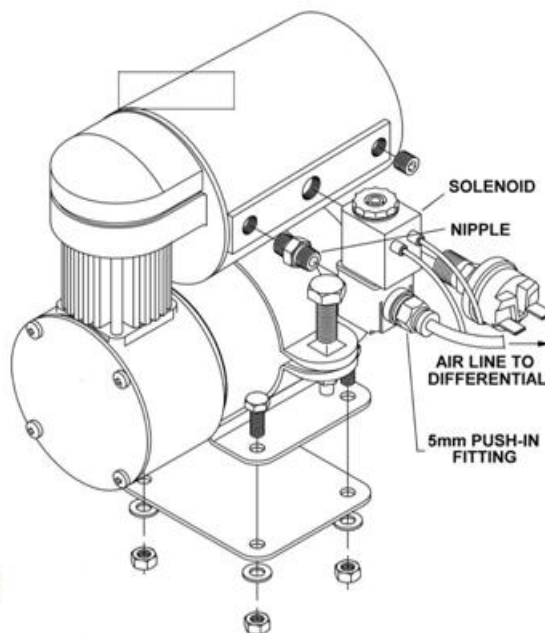
**NOTE : The solenoid exhausts compressed air through the center of the black retaining cap when the Air Locker is disengaged. Make sure this orifice cannot be obstructed (the TRE equipped 4mm Oil return line should mount into the solenoid black retaining cap hole)**

- Apply Teflon paste to the threads of the 5mm push-in fitting and assemble it into the solenoid outlet port (arrow side) and tighten.

**Note : Do not screw the plastic black part of the solenoid when mounting the solenoid.**

**Figure 19.**

**TRE**  
**Air Compress**



## IMPORTANT:

TRE 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 TRE distributor.

### D-3. Running and Securing the 5mm Air Line and 4mm Oil Return Line

The path taken by the air line from your air 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.
- 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, trim the line to length with a sharp knife.

**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**

- 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.

#### **D-4. Connection to the Bulkhead Fitting(5mm Air Line)**

- 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. 21.)
- Insert the outer compression nut over the air line.
- Push the air line onto the barb on the center compression nut, ensuring that it is pushed all the way to the end.



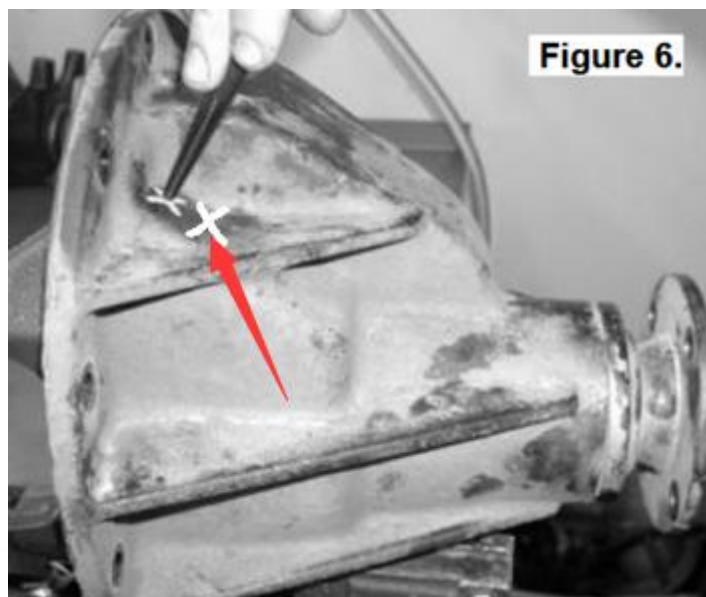
**HINT : If the tube is too difficult to push on, place the end of the air line into a cup of boiled water to soften the tubing.**

- 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

#### **D-5. Connection to the Bulkhead Fitting (4mm Oil return Line)**



- Screw the blue interface bulkhead fitting on the mark of differential case and tighten.
- Trim the air line to length using a sharp knife.

**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.**

- Connect the 4mm air line to the blue interface bulkhead fitting from solenoid.
- Secure any loose sections of tube with a cable tie.

## **D-6. 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:

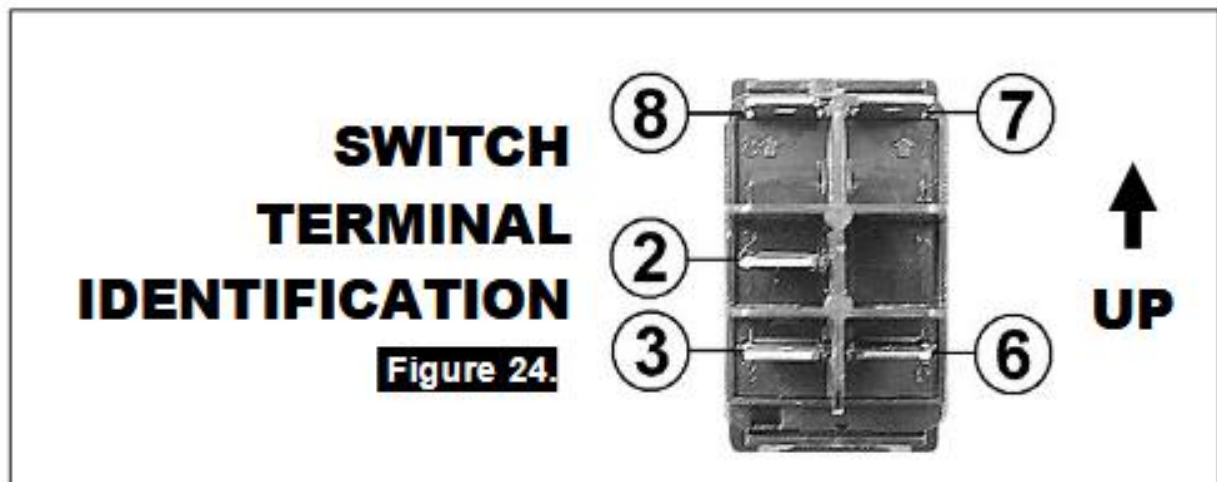
- Switch (es) MUST be mounted and should never be allowed to simply dangle from the wiring loom during vehicle use.
- Switch(es) should be within easy reach of the driver. Ideally, any Air Locker switch should be able to be operated without physical effort or distraction to the driver.
- Switch(es) should 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).

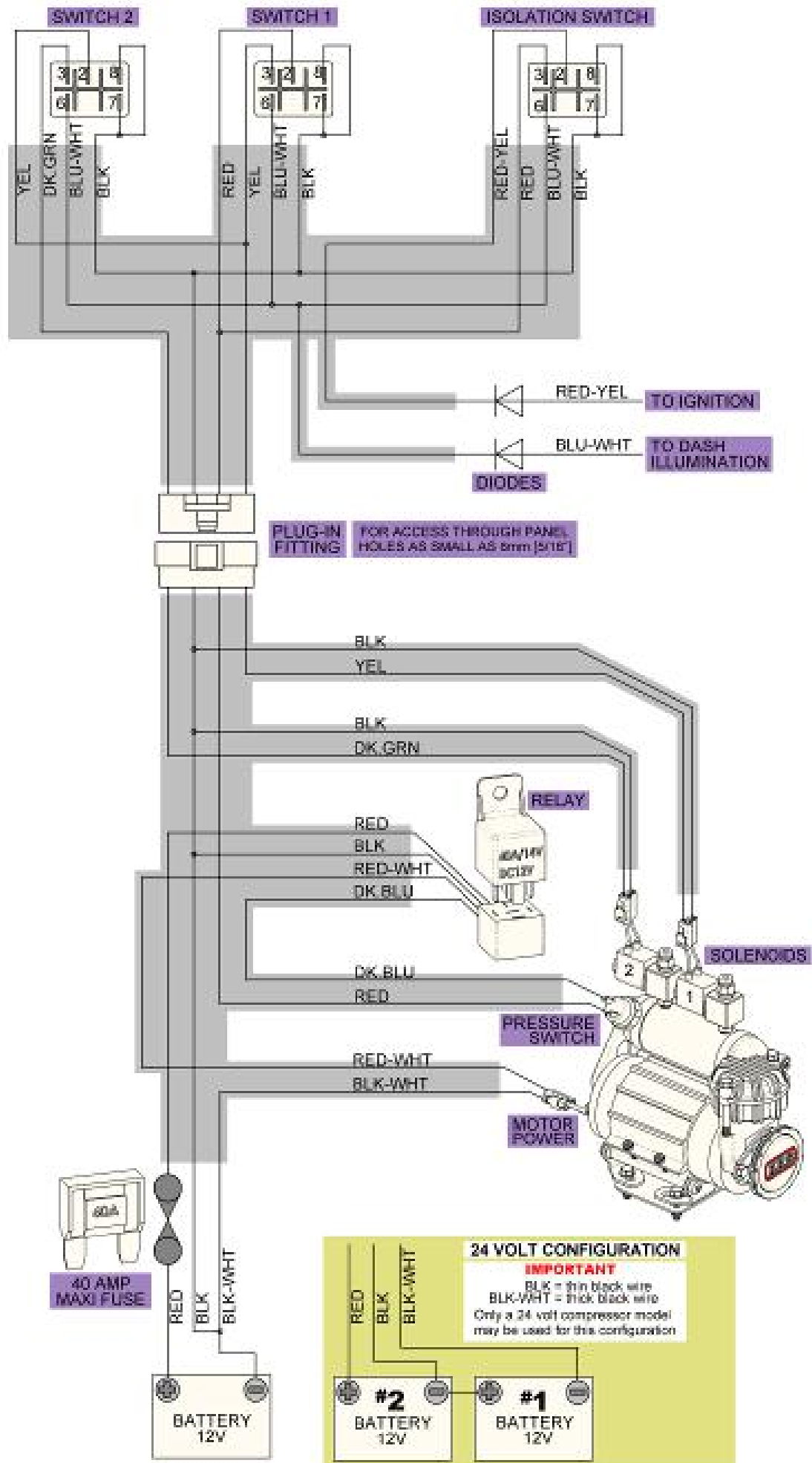
## E) Mounting & Connecting the Electrical System

### E-1. Wiring the Actuator System

### E-2. Connection to an Air Compressor

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







## F) Testing & Final Assembly

### F-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 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 rapid period. Air system recharging within that time period would indicate that a leak is present in the system.
- 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.

### F-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.
- 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

### **F-3. Re-Sealing & Filling the Differential**

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

- Replace the differential cover using gasket sealant or a new standard 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.

### **F-4. Post-Installation Check List**

Now that the Air Locker installation has been completed, TRE 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 TRE 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 TRE Air Locker Operating & Service Manual.

# ATTENTION

For the safety of vehicles and occupants, there are several points that must be understood and complied with:

- 1、 When driving at high speed on high traction pavement (IE: dry pavement, cement pavement, asphalt pavement, gravel pavement, etc.)The differential locking device has great damage to the transmission components and may cause an accident. The locking device can only be turned on when the road surface with high traction is required.
- 2、 Turn on the differential lock will affect the steering. User should cost time to understand how the differential will affect the steering. Otherwise, if you don't understand it, you can not use it rashly, which may put you and the occupants at risk.
- 3、 The switch should be installed in the proper range of the driver, but must ensure that the switch will not be accidentally touched by the driver, the occupant or the object loosened in the car, accidental turn on, or turn off will cause the vehicle out of control.
- 4、 When in use, the independent switch can avoid the unnecessary work of the air pump. To avoid accidental turn on the differential locker , the differential locker switch should be turned off when not in use. Do not use a independent air pump switch to simultaneously control the locking device. The air pump switch must be used separately.
- 5、 Although the stable and quality of the TRE differential lock is very strong, the locking device should not be turn on when the wheel is idling. Otherwise, the impact force generated when the two wheels are suddenly forced to rotate at the same speed may cause the half shaft be damaged , locking part worn. When turning on the locking device, make sure that the vehicle in a stopped state , is not activated or decelerated. Do not turn on the locking device when turning, do not turn on the locking device while braking.

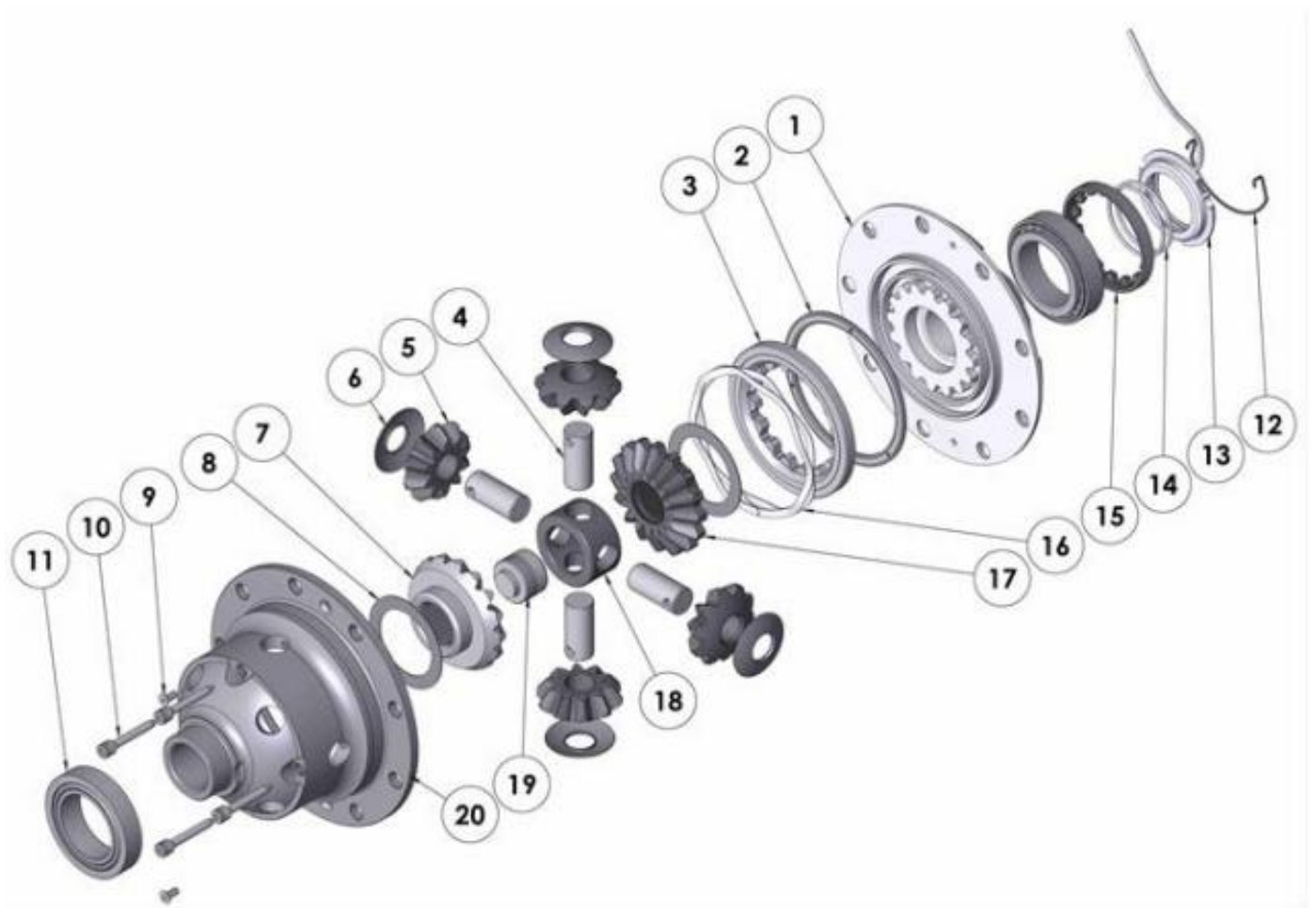
- 6、 In order to reduce the damage to the vehicle transmission system and reduce the risk of vehicle control, the speed should be reduced when turning on the locking device, slowly and skillfully off-road driving to achieve the best years of vehicle use
  
- 7、 Do not make sharp turns after locking the differential . Especially when the front and rear locks are locked at the same time, keep the straight line as much as possible. Otherwise, it is easy to twist the half shaft or Differential.
  
- 8、 If the locking device is not used frequently, it will produce oil film. Please test it .

# PART LIST

**Air Locker model: TR 136**

**NISSAN H233B, 31 SPL**

## 1. Exploded Assembly diagram



## 2. Component List

<b>MODEL No. : TR136</b>			
<b>ITEM #</b>	<b>QTY</b>	<b>DESCRIPTION</b>	<b>NOTES #</b>
01	1	FLANGE CAP ASSEMBLY	
02	1	BONDED SEAL	
03	1	CLUTCH GEAR	
04	4	SHORT CROSS SHAFT	
05	4	PINION GEAR	
06	4	PINION THRUST WASHER	
07	1	SIDE GEAR	
08	2	SIDE GEAR THRUST WASHER	
09	2	COUNTERSUNK SCREW	
10	4	RETAINING PIN	
11	-	TAPERED ROLLER BEARING	NOT SUPPLIED
12	1	SEAL HOUSING RETAINING CLIP	
13	2	SEAL HOUSING ASSEMBLY	
14	2	SEAL HOUSING O-RINGS	
15	1	ADJUSTER NUT	
16	12	RETURN SPRINGS	
17	1	SPLINED SIDE GEAR	
18	1	SPIDER BLOCK	
19	1	THRUST BLOCK	
20	1	DIFFERENTIAL CASE	
*	1	RING GEAR BOLT SPACER	
*	1	BULKHEAD KIT, O-RING TYPE, 3.5-5mm	
*	1	5mm PUSH-IN FITTING (RI 5 1/8" )	
*	1	NIPPLE, 1/8" BSP, MALE TO MALE	
*	1	NYLON AIR LINE (5mm Dia X 6m long)	
*	1	SOLENOID VALVE	
*	1	ON/OFF SWITCH	
*	1	SWITCH COVER 'REAR'	
*	10	CABLE TIE	
*	1	WARNING LABEL	
*	1	RHINO STICKER	
*	1	TRE 4X4 BROCHURE	
*	1	WARRANTY CARD	
*	1	INSTALLATION MANUAL	