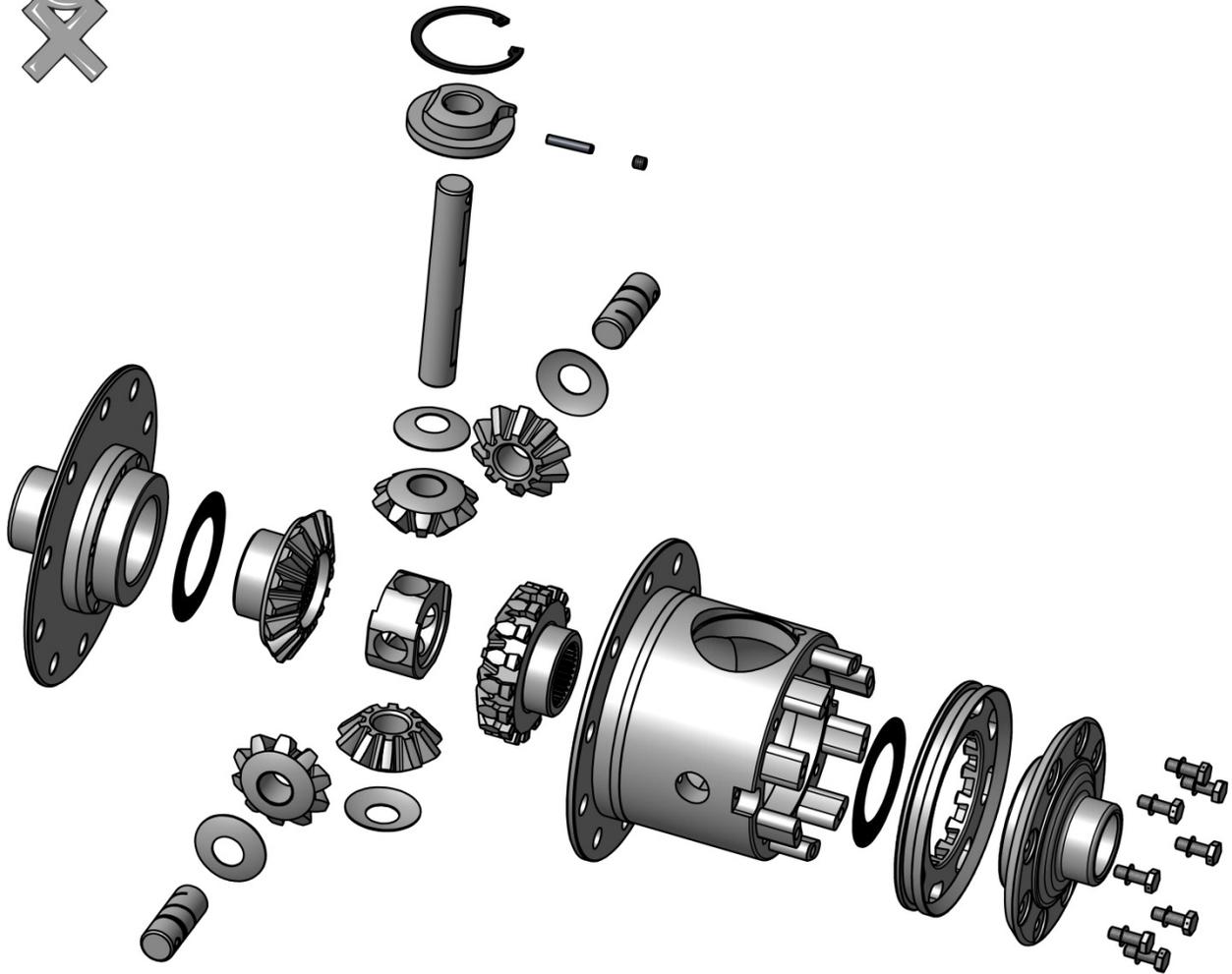




OX LOCKER

INSTALL, USER, & TECH MANUAL



**MADE IN
USA**

OX OFF ROAD

Products built for the competitor

440 South Pinellas Av.
Tarpon Springs FL 34689
(727)-230-7803
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OX LOCKER INSTALL, USER, & TECH MANUAL

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This manual is to be used in conjunction with you vehicle manufactures service manual, and is written as set of carrier replacement instructions. If installing locker in a different housing or a different ring and pinion set is used, gear setup and bearing preload should be done per manufactures instructions.

TIP: Go to www.OX-USA.com and visit the instructions and support section to see installation and adjustment videos. The videos can be very helpful in understanding the different shifter adjustments and installations

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Prepare for Differential Carrier Removal

1. **Lift Vehicle**

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.

2. **Drain Differential Fluid**

If a drain plug exists, remove it and completely drain all differential oil from the housing. If no drain plug exists then the oil can be drained by loosening cover bolts and gently prying the cover away at the bottom until oil runs out. Once drained, completely remove the differential cover plate.

3. **Remove Axle Shafts**

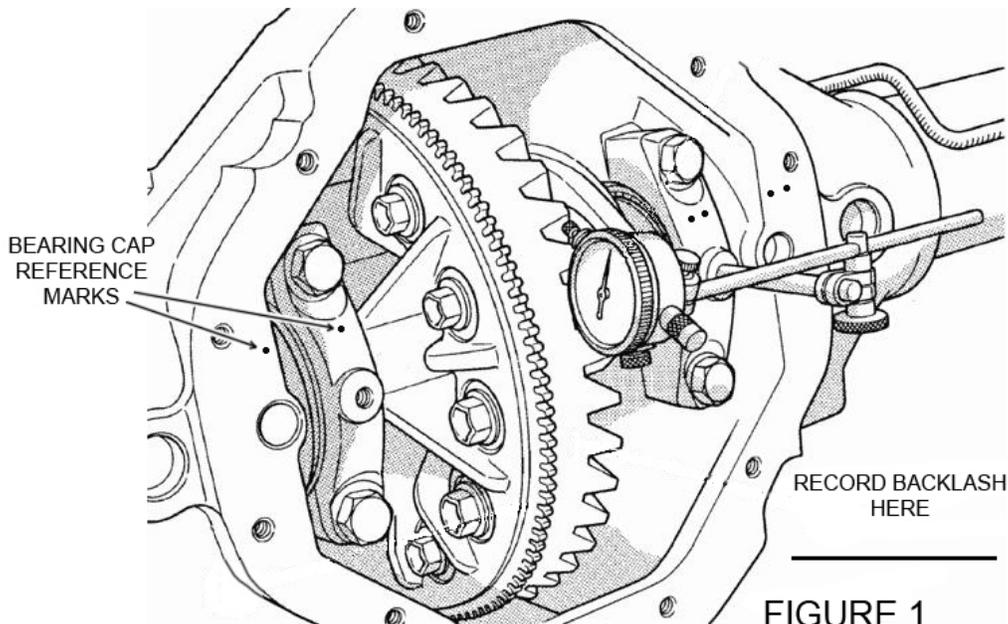
Due to the large variety of applications available for the OX locker, it would not be possible to cover all methods of axle removal. We recommend removal of the wheels, and axle shafts according to your vehicle manufacture's service manual.

4. **Mark Bearing Caps**

Mark the bearing caps in a way that will enable you ensure you reinstall them in the same location and orientation. They **MUST** be reinstalled in the same position. Look closely they may already be marked (note punch marks on figure 1 below).

5. **Check Current Backlash**

You can skip this step, if installing new ring and pinion. Check current back lash and record below before removal, we will use this for reassembly.



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Remove Carrier

NOTE: On some applications, a housing spreader will be necessary for carrier removal and installation.

6. Remove Carrier from Housing

Remove both carrier bearing caps. Use a housing spreader tool to spread the housing if necessary.

WARNING: Do **NOT** spread housing more than .020" or use on aluminum housings.

Carefully remove the carrier by pulling it from the housing, ensuring to keep track of the locations of the bearing races and any loose shims. You will need to know the location of these shims if you are not replacing the ring and pinion.

If you used a housing spreader, be sure to release any pressure the tool is exerting once the carrier has been removed.

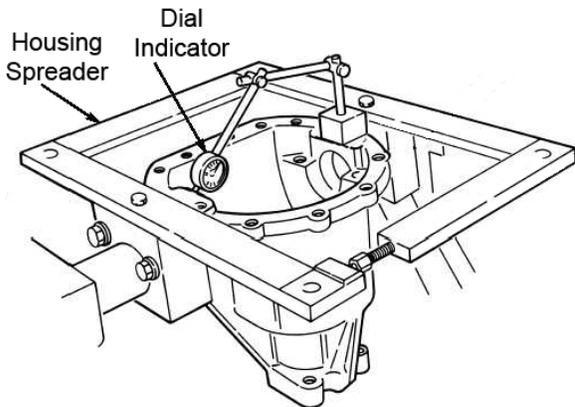


FIGURE 2

7. Measure and Record Dimensions

Identify shim locations **A** or **B** for your carrier per figure 3 and record dimensions for your style using all the previously removed shims in their positions as noted in step 6. This step should be done accurately (within .001") to ensure a proper installation with correct bearing preload and gear backlash.

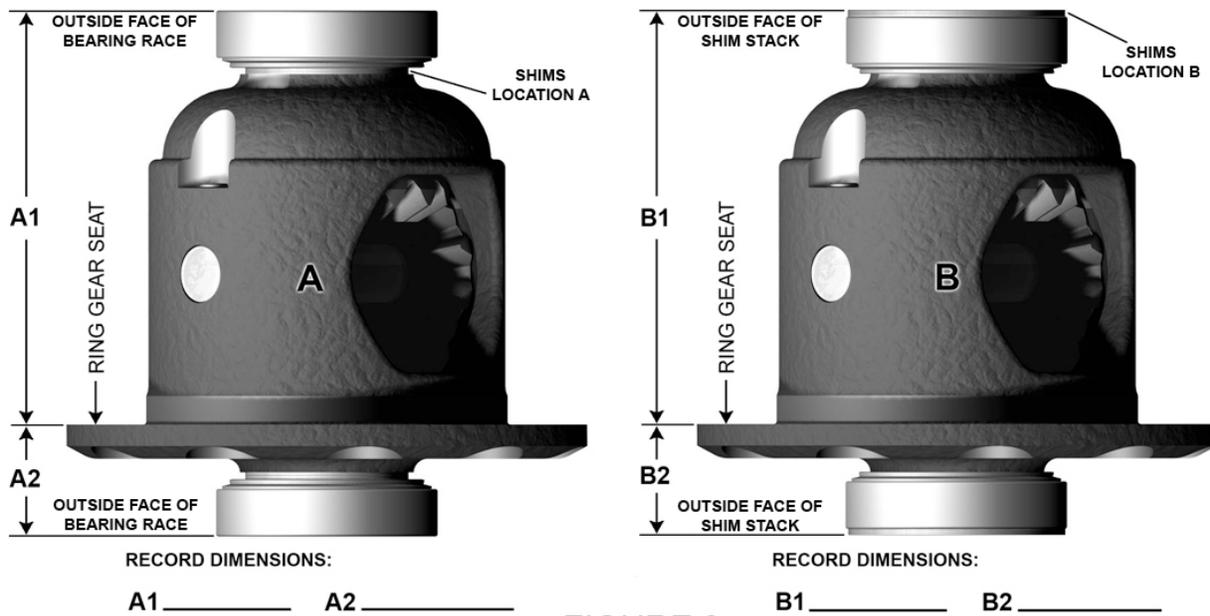


FIGURE 3

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Prepare OXLocker for Installation

8. Prepare for Bearing Install

If you are installing your OX locker with shims in location “B” (from figure 3) you can now go to step 9. If using location “A”, it is now time to determine the proper shim stack thickness. Using dimensions recorded in step 7, compute the amount of shims necessary to obtain dimensions A1 & A2 on the OX locker. Place shim stacks on the appropriate bearing journal before pressing on bearing. This step should be done accurately (within .0015” per side and .002” total)

NOTE: *In some cases it may be necessary to change shim locations as seen in figure 3, from “A” to “B”, (usually in axle diameter upgrade situations). If this is the case, simply install shims as seen in location “B” using dimensions from “A”.*

9. Press on Bearings

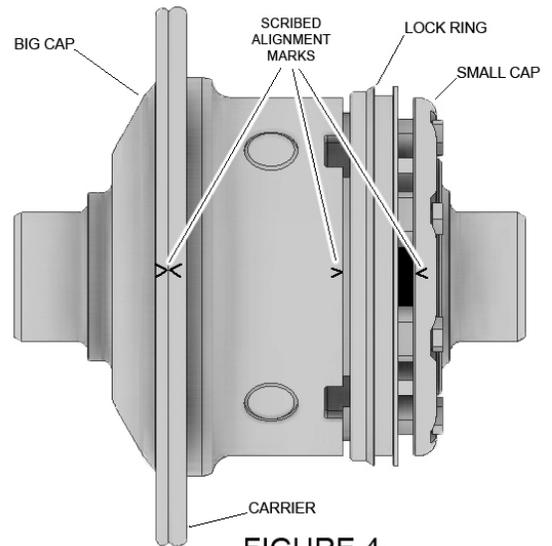
Apply a thin layer of gear oil to the inside of the carrier bearings to help with the installation. Now, using press, install carrier bearing onto the bearing journal of your OX locker making sure that you are aligned squarely. Press bearing until seated to the base of the bearing journal or shim stack. Repeat for other side bearing journal.

NOTE: *Most OX lockers come pre-assembled, however in some cases (Dana 35's and 60's) the ring gear does not fit over the locking ring, and final assembly will be required after the ring gear is installed.*

10. Install Ring Gear

In some cases due to the variance in OEM and aftermarket ring gear bolt sizes you may need to ream the big cap of the OX locker to accommodate larger ring gear bolts. In most cases they are already double drilled for your convenience. Should reaming become necessary the big cap may need to be rotated to align bolt holes, keep alignment marks as close as possible. Do NOT attempt to drill carrier.

Remove ring gear (and tone ring if applicable) from original differential carrier and transfer to OX locker. It may be necessary to remove the small cap and locking ring from the OX locker, be sure to note orientation for reassembly. Ensure the scribed alignment marks are aligned, and if double drilled the correct diameter bolt holes are used and install ring gear using thread lock, and torque per manufacturer's specifications.



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11. Final Assembly of OX Locker

If you did not need to remove the small cap and lock ring in step 9, and tabs are locked, your OX locker was final assembled from factory and you are ready to proceed to step (12).

Find hardware package that came with locker. Install 4 springs in the 4 spring pockets in the carrier. Next place the locking ring and small cap back on locker as they were before removal.

Ensure threads are clean and install grade 8 bolts and locking tabs in position using red **Loctite 263**. Tabs have a slight bend that should be turned up to make it easier to bend into locking position.

Torque bolts to 15 ft lbs for 1/4" and 26 ft lbs for 5/16" bolts. Once all bolts are torqued, bend the locking tab that best lines up with the flat on the bolt head tight to the bolt head.

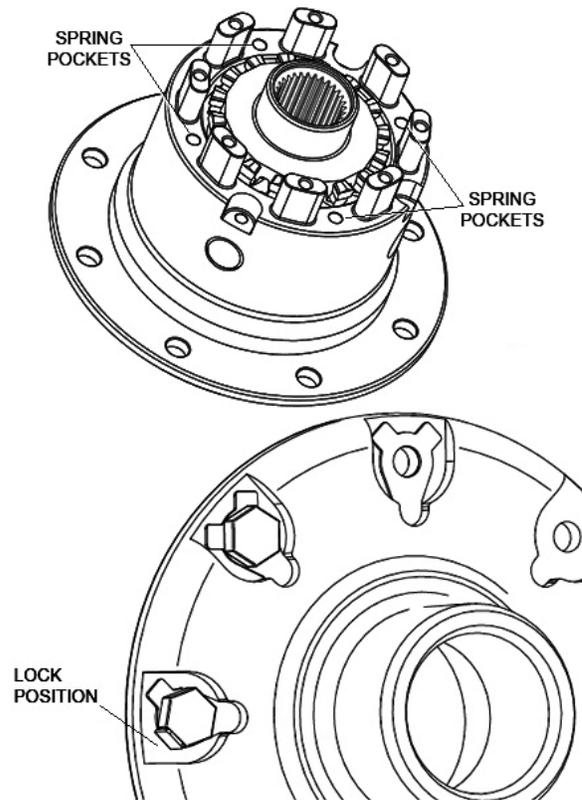


FIGURE 5

OX Locker Carrier Installation

12. Clean Housing

Clean housing cover gasket surface to ensure a good seal on installation. Then clean out housing and make sure axle tube drains are clear and clean.

13. Prepare for installation

If using shim location "B", from figure 3, it is now time to determine the proper shim stack thickness. Using dimensions recorded in step 7, compute the amount of shims necessary to obtain dimensions B1 & B2 on the OX locker. Create both shim stacks and place with bearing races. This step should be done accurately (within .0015" per side and .002" total).

Using a spreader tool, if necessary, spread the housing as seen in figure 2.

WARNING: Do **NOT** spread housing more than .020" or use on aluminum housings.

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14. Install OX Locker into Housing

Place locker into housing using correct shim stacks and bearing races on both sides and making sure they are seated. Install bearing caps in same position and orientation as removed and torque to manufactures specification. If housing spreader was used remove before torquing bearing caps.

15. Check Fit and Clearance

Clearance issues are rare, but they do happen. Now is the best time to check that there are no problems so they can be taken care of before installation is complete.

With OX locker in position, push and wedge locking ring in lock position, (locking gear alignment may be necessary) rotate carrier and make sure there is no interference with housing, and make sure there is .020" clearance between lock ring and pinion gear. Next, remove wedge from locking gear and test fit cover and fork assembly to ensure there are no clearance issues.

NOTE: *If necessary view appendix A for clearance solutions.*

16. Check Backlash and Preload

Using the figures recorded in step 5 and figure 1, check to ensure backlash has been replicated, and that both backlash and bearing preload are within manufacturer's specification.

NOTE: *If backlash requires adjustment, it will typically change about 0.007" for each 0.010" that the carrier is moved. To decrease the backlash, move the carrier closer to the pinion. This is not exact for all ring & pinion sets, but it is a good general guideline.*

17. Install Axle Shafts

For floating axles, as shown in figure 6, install axles per manufactures instructions, and proceed to step 19.

For C-clip retained axles it will be necessary to partially disassemble the OX locker to gain access for C-clip removal and installation. Proceed to step 18 for procedure.

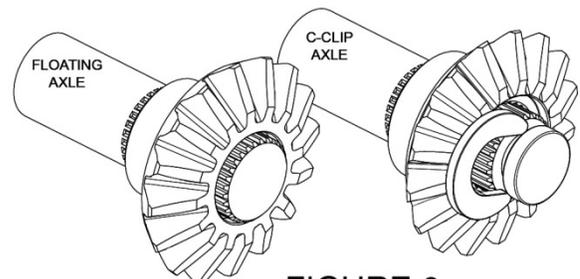


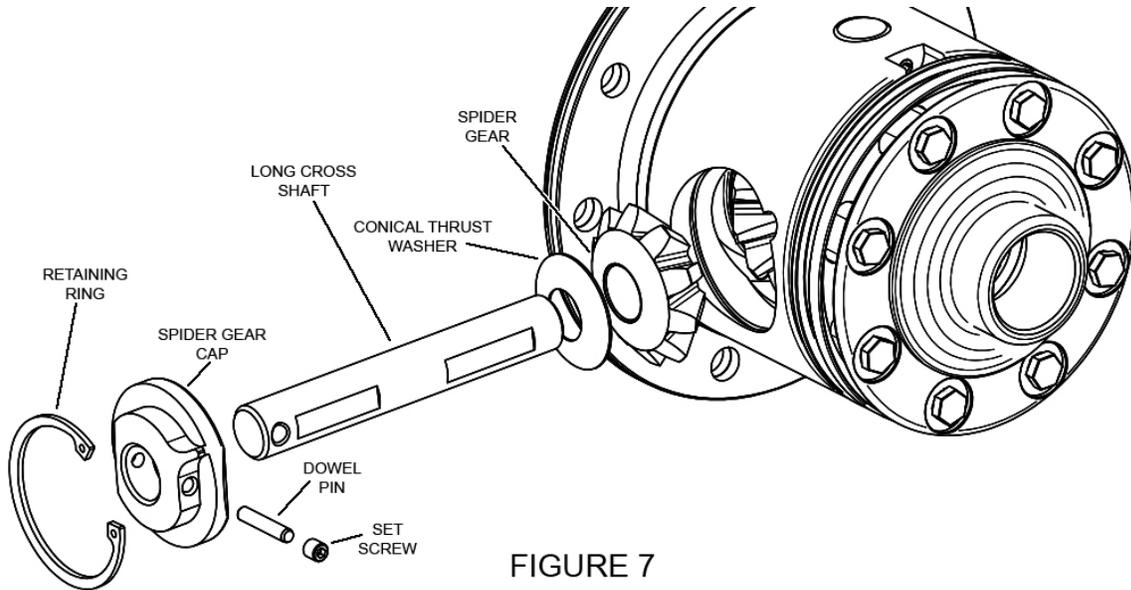
FIGURE 6

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18. Axle C-Clip Installation

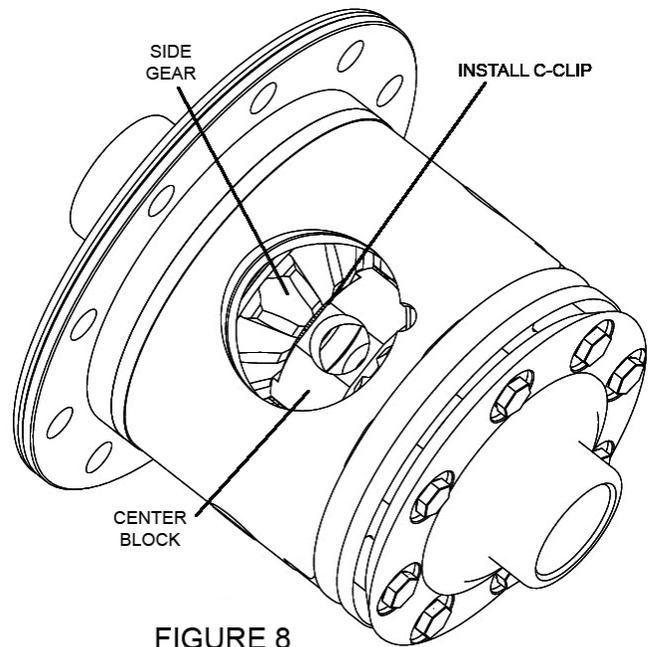
Referencing figure 7, remove retaining ring, spider gear cap, long cross shaft, conical thrust washer, and spider gear, to access C-clip groove on axle shaft.

WARNING: Failure or damage could result. Be aware, removing cross shaft may allow conical thrust washer on opposite side to slide out of position. Make sure it is in position when reinstalling cross shaft.



Place axle shafts in position so C-clip groove is aligned between center block and side gear. Install C-clips on axle shafts thru window as shown in figure 8. Pull axles outboard to seat C-clip into side gears.

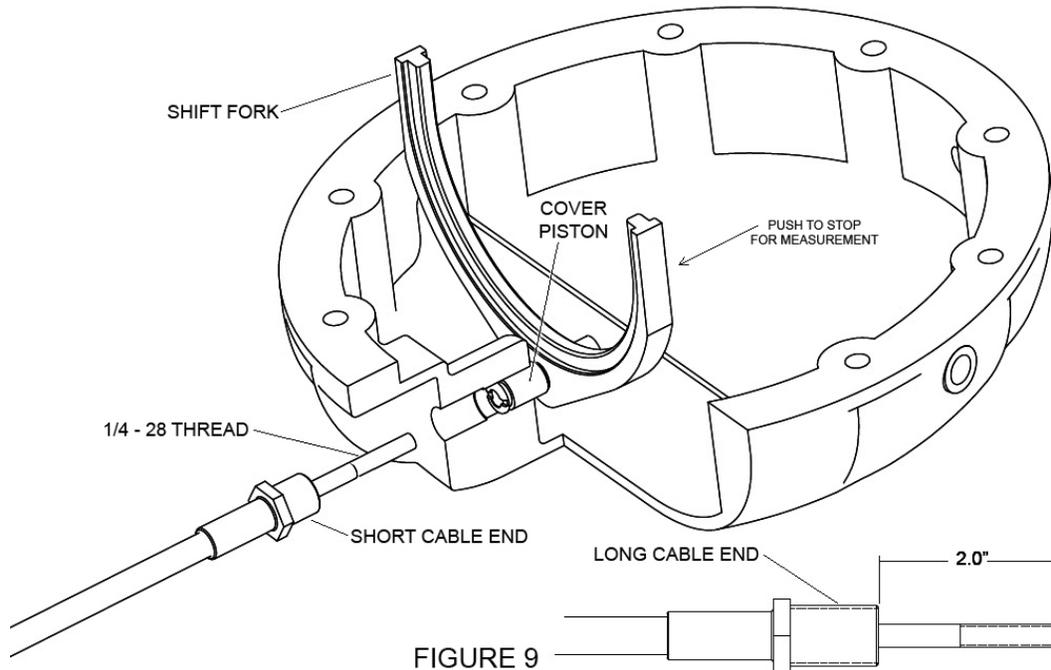
Reinstall spider gear, conical thrust washer, long cross shaft, spider gear cap, and retaining ring. **Make sure conical thrust washer on opposite side is in position upon installation of cross shaft.** Finish installation of axles per manufactures service manual.



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19. Cable into Cover Installation

If you are using the air shifting system, skip this step and move on to step 20. Place the short cable end of the cable into position and screw the core cable ($\frac{1}{4}$ -28 thread) into the cover piston about 17 turns. Next screw short cable end into cover and tighten. Now push the fork towards cable until it hits cover and stops. With fork in position check and set measurement as seen in figure 9 to 2.0" by rotating cable core until proper measurement is obtained (TIP: this will be easier with the cable laid out straight).

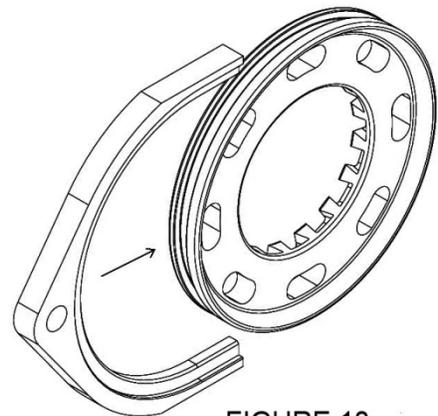


20. Cover Installation

After making a final check for security of all hardware, ensure housing and gasket surface is clean. Apply an oil resistant silicone gasket maker on housing cover mounting surface and place cover in position making sure the shifting fork engages into the lock ring properly. Install and tighten bolts then clean off any excess sealer. Rotate pinion yoke and check for free rotation.

21. Service with Oil

Service with oil per manufactures service manual, (if axle assembly has been rotated causing the fill level plug to be lower than it should be adjust oil level as necessary).



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Manual Shifter Installation

NOTE: *Poor cable routing and shifter adjustment are the leading causes for an inoperative locker.*

22. Route Cable

Before routing the cable, look at chassis and plan a good path to follow. Keep cable away from heat sources and moving parts as much as possible. Secure cable to chassis making sure to allow for full suspension travel.

- Tips:**
- Use the shortest cable necessary to mount shifter in desired location.
 - Avoid sharp and multiple bends whenever possible.
 - Make sure suspension flex will not force cable into an undesirable position.
 - Avoid securing cable to moving parts whenever possible.
 - If high temp areas are unavoidable, use a header wrap to shield cable from heat.
 - A 7/8" hole is necessary for the cable end to fit thru (in many cases a body floor drain can be used).

23. Mount Shifter to Cable

With cable in position use a medium strength Loctite and screw the spring piston onto cable core until the 5/8" measurement is obtained as seen in figure 11. With shifter in unlock position, loosen the swivel fitting lock screws and screw swivel fitting onto the cable end until there is no slop in shifter handle (It will be easier to tell when all slop is removed if you temporarily remove the shifter knob and trigger cup). Tighten swivel fitting lock screws. And loosely snug jamb nut against swivel fitting.

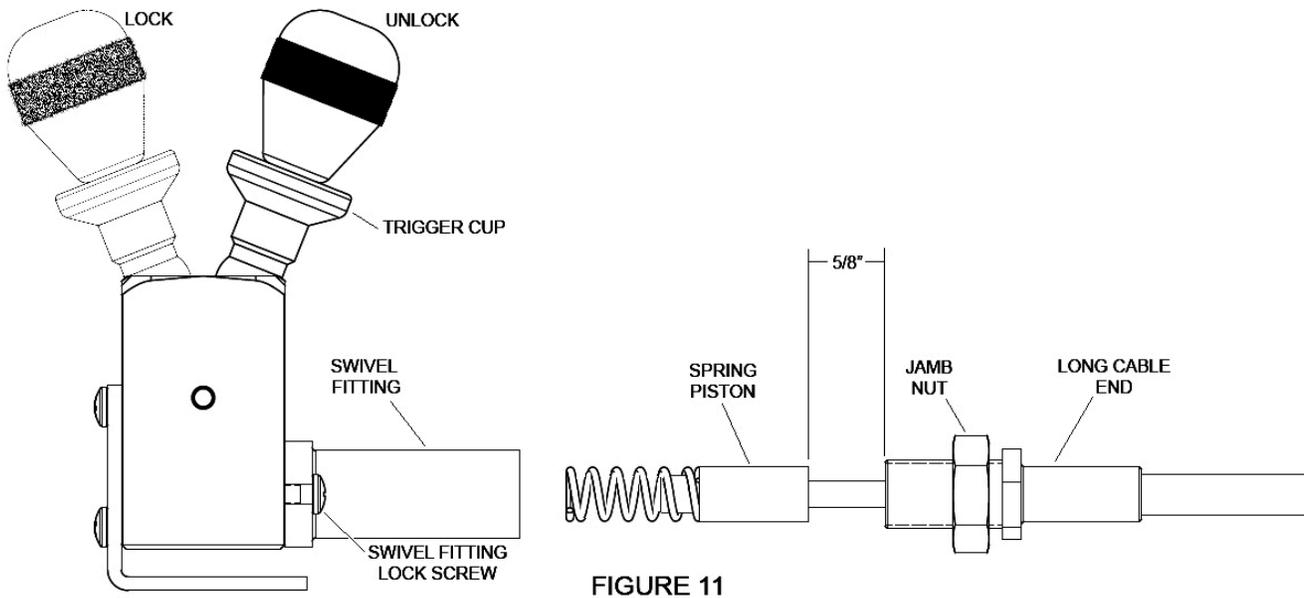


FIGURE 11

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24. Mount Shifter Assembly

NOTE: *The shifter bracket to shifter mount screws are in a square pattern allowing it to be attached in multiple positions for versatility in vehicle mounting.*

Using mounting holes in shifter bracket, securely attach shifter to vehicle. Recheck shifter adjustment and tighten jamb nut to swivel fitting. Proceed to Operational Test Procedure.

Operational Test Procedure

25. Operational Check

NOTE: *Some vehicles use a disconnect on the front axles. The disconnect must be engage (or not disconnected) for this procedure. Additionally any locking hubs should be locked.*

Chock tires so vehicle cannot roll, and place vehicle in neutral. On the appropriate axle, lift only one wheel off the ground enough to rotate by hand. With the ⓪X locker shifter in the unlock position make sure the lifted tire/wheel can be rotated. Now select the shifter to the lock position and slowly attempt to rotate the wheel again. The wheel should lock and become unable to rotate (some back and forth movement should be possible but wheel should not rotate). Unlock shifter and check for free rotation again.

If unable to engage to lock recheck shifter adjustment and see troubleshooting section.

Operation and Use

The ⓪X locker is designed for off road use. Driving on high traction surfaces such as dry pavement, concrete, etc. with your ⓪X Locker engaged is very harsh on drive train components, makes steering difficult and could result in damage to your vehicle. Lock your ⓪X locker only when necessary to overcome limited traction.

Having your ⓪X Locker(s) engaged **will affect your steering** even if you only have one in the rear axle. Make sure you take the time to get to know the effects of driving with a locked differential before you attempt any use which may put you or your vehicle at risk.

The ⓪X locker can be engaged or disengaged at any speed as long as you are not experiencing wheel spin.

Although it is not necessary, the manual shifter is designed to lock in position if desired. To lock in position simply screw the shift knob down until the trigger cup locks handle in position.

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Service Guide

Lubricant Specifications

OX lockers are designed to operate in those lubricants recommended by the vehicle/axle manufacturer. No special lubricant is needed. For very cold weather applications, use the lightest oil the axle manufacturer will allow to overcome possible sluggish operation.

Service Schedule

Oil changes should be done by axle manufactures recommendations at minimum. If harshly used or used in sand, water or mud oil changes should be done more often.

Operational Check

Operate the OX Locker at least every 60 days to ensure it is in good working condition and to exercise cable and moving components.

Infield Service

OX lockers are designed to give you years of trouble free use, however, harsh terrain can sometimes find a way of taking its toll; often when you least expect it! Just as you carry spare tires, fuses, etc., you should also consider carrying a Drive Away Lock, (part no. OX-DAL-001). The Drive Away Lock is a manual locking device that can be quickly installed, should your shifting system become trail damaged. The Drive Away Lock can also be easily removed/unlocked when finished off road for street driving.

Trouble shooting

Locker Will Not Engage or Disengage

Engagement problems that arise from a previously operational locker are rarely internal. The most common issues are a sticking or stiff cable and or poorly adjusted shifter. The shifting cable should be inspected for melted or chaffed spots and replaced if found to be stiff. If cable is found to be at fault, make sure to correct any routing issues upon replacement.

Check shifter adjustment per step 23.

If locker will not disengage you can usually get it to disengage by partially disassembling the shifter and pulling on cable core (make sure differential gears have no torque load, the locker will not disengage with a differential axle torque applied).

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If locker will not engage, the cable is found to move freely, and the shifter is properly adjusted the internal shifting mechanism should be checked. To check for proper internal shifting operation, first remove cable from cover. Using something that will not damage the threads or piston bore, push on cover piston (refer to figure 9) and perform operational check per step 25. Piston will only move about 5/16" and should take about 25 pounds of force to go into lock. You may need a second person to help rotate tire while you are pushing on piston. If locker will not engage remove differential cover and inspect for defects.

Shifter Loses Adjustment

The shifter should not fall out of adjustment; additionally the cables do not stretch causing the cable to lose adjustment.

Check the crimped on cable ends at the differential and the shifter and make sure the cable sheath is not pulling out of the crimp.

Check for excessive slack in the cable and make sure the cable is secured to vehicle and is only able to flex or move for suspension travel, also look for bends that may be too sharp, try to maintain no less than a 6" radius.

Check that the shifter has no slop, it should have tension as soon as you start to shift into the lock position and make sure spring piston shown in figure 11 is not rotating out of position, Loctite piston with a medium Loctite if necessary.

Locker Slow to Engage or Disengage

This is most likely caused by a stiff cable. You will generally find with a stiff cable the locker has more trouble disengaging than engaging. If this is the case inspect cable for damage. The most common cause of a stiff cable is burn or melted spot from the exhaust system or high heat source. If locker will not disengage you can usually get it to disengage by partially disassembling the shifter and pulling on cable core (make sure differential gears have no torque load, the locker will not disengage with a differential axle torque applied).

If you cannot find any issues with the cable you may want to disconnect the cable at both ends to properly check for freedom of movement. It should move with ease maybe a few pounds of force at the most. You may need to simulate the bends in the cable as installed to ensure a good check.

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Appendix: A

Clearance Issues

Pinion Face Clearance

Some aftermarket pinion gears and on rare occasion factory gears extend too far into the differential. There should be a minimum of .020 of an inch between the pinion gear and any part of the OX locker carrier. Figure 12 shows the preferred method for correcting clearance issues with the pinion face. This will not harm the gear set.

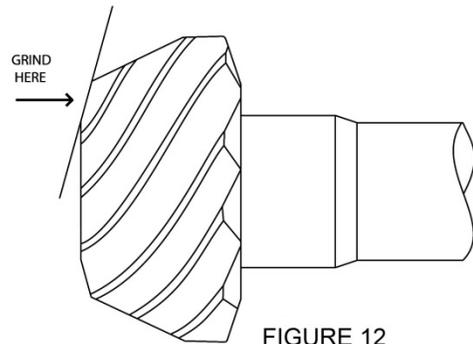


FIGURE 12

Housing Clearance

Figure 13 shows the most likely area of OX locker carrier to housing, or shifting fork to housing clearance issue. As a general rule ensure there is .050" clearance between the carrier and housing, or shifting fork and housing.

Watch for carrier bolt head to housing clearance. The Chrysler 8.25 carrier is very close to housing, some dressing on the housing may be necessary. You should not have to take off enough to affect the integrity of the housing.

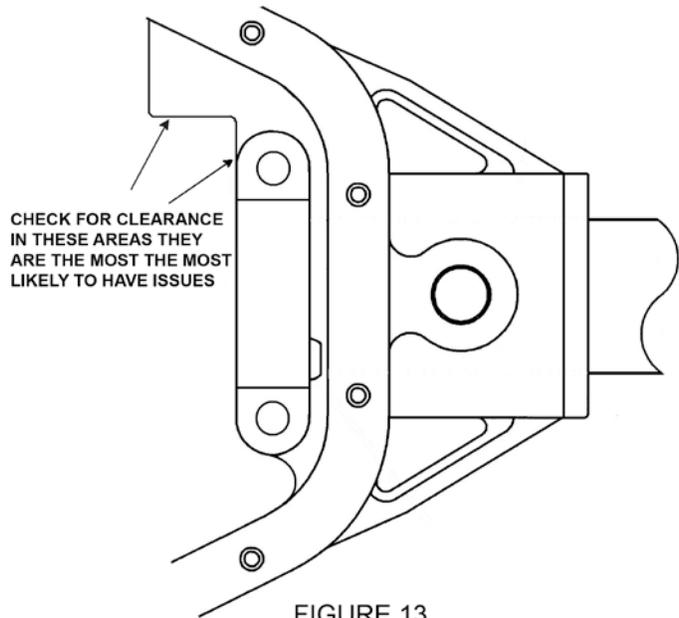


FIGURE 13

WARNING: After any grinding, thoroughly clean housing to remove any powdered metal before reinstall of locker.

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Appendix: B

Bearing Chart

APPLICATION	BEARING	RACE
AMC 20	LM603049	LM603012
Chrysler 8.25, 27 & 29 Spline	LM603049	LM603012
Dana 30, 27 Spline (Standard)	LM501349	LM501314
Dana 30, 30 Spline (Upgrade)	LM102949	LM102911
Dana 35, 27 Spline (Standard)	LM501349	LM501314
Dana 35, 30 Spline (Upgrade)	LM102949	LM102911
Dana 44, 30 spline (Standard)	25590	25523
Dana 44, 33 & 35 Spline (Upgrade)*	LM104949	LM104912 or LM104911A
Dana 44 JK Rubicon	JLM704649	JLM704610
Dana 60, 30 & 35 spline	387A	382S
GM 10 bolt, 28 & 30 Spline (Late 3.063")	LM603049	LM603012
GM 10 bolt, 28 & 30 Spline (Early 2.891")	LM102949	LM102911
Ford 8.8, 28 & 31 Spline	LM603049	LM603012

*the LM104911A is closer to stock size and will require less shim.

Cable Length Guide

This is just a guide and is tailored to standard cable installs with the shifter mounted in the center console area. Cable lengths will vary upon lift kits, long arm kits, and custom shifter location. Custom lengths can be determined by using a fuel line or even garden hose to reference to a cable length. Cables are measured from end to end of outer sheath including threads (does not include the cable core). For best results use the correct length cable for your shifter location, excess cable is not optimal.

VEHICLE MODEL	LENGTH (UP TO 4" LIFT)	LENGTH (UP TO 8" LIFT)
Jeep Front Installs (TJ, YJ, JK)	78" Cable (46001-78)	84" Cable (46001-84)
Jeep Rear Installs (TJ, YJ, JK)	70" Cable (46001-70)	78" Cable (46001-78)
Cherokee Front Install (XJ)	84" Cable (46001-84)	90" Cable (46001-90)
Cherokee Rear Install (XJ)	87" Cable (46001-87)	90" Cable (46001-90)
Wagoneer Front Install (XJ)	84" Cable (46001-84)	90" Cable (46001-90)
Ford Bronco up to 1977	84" Cable (46001-84)	87" Cable (46001-87)
Ford Bronco 1978 & UP	87" Cable (46001-87)	90" Cable (46001-90)
Jeep Unlimited (4D) Rear Install (JK)**	90" Cable (46001-90)	96" Cable (46001-96)
Electric Shift Front or Rear	36" Cable (46001-36)	48" Cable (46001-48)

**shifter mounted on floor between driver door and seat

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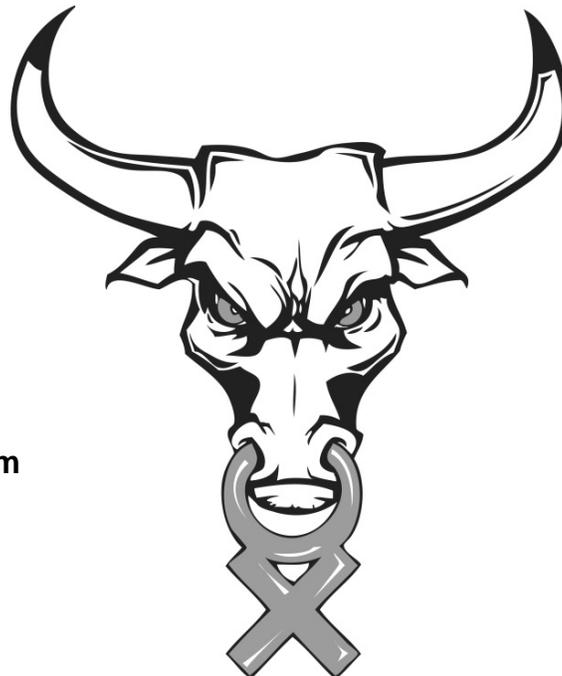
OX Locker™ Limited Warranty

ONE YEAR limited warranty on manufacturer defects:

- This warranty covers only parts originally supplied by OX-USA if they are shown to have a manufacturer's defect. All parts must be returned to OX-USA and if upon inspection by OX-USA, they were installed correctly in their intended application and were not mistreated they will be repaired or replaced.
- This warranty does not cover vehicles with modified high-horsepower engines (modified beyond the original manufacturer's recommendation).
- OX-USA recommends professional installation by a qualified mechanic. Purchaser/user assumes all risks and liabilities in connection therewith.
- Installation and use of these parts constitutes acceptance of all the above stipulations. If the purchaser/user does not agree to these terms, the OX Locker should not be installed and returned to the supplier.
- TO REDEEM your coverage you must return the defective part(s) along with your claim #. Claim # can only be obtained by calling (727)-230-7803 or e-mailing support@OX-USA.com

OX Locker™ - US Pat. 6,432,020

Any modifications to the carrier must be performed by a qualified machine shop. Not doing so could result in bodily injury & will result in voiding the warranty. OX-USA assumes no liability for damages or injury incurred as a result of misuse or modification.



Tech Support:
(727)-230-7803
support@ox-usa.com