Max IV

Drive Train Service and Repair

Sections:

- Max IV Bearing Replacement
- Max IV Axle Replacement (Thru-Bolt & Setscrew)
- Max IV Sprocket Replacement (Thru-Bolt & Setscrew)
- Max IV Snap Ring Front Axle Replacement
- Max IV Snap Ring Center Axle Replacement
- Max IV Snap Ring Rear Axle Replacement
- Max IV Snap Ring Front Sprocket Replacement
- Max IV Snap Ring Center Sprocket Replacement
- Max IV Snap Ring Rear Sprocket Replacement

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Axle Bearing Replacement

Tools Required:

9/16" Wrench
9/16" Socket
Torque Wrench
Grease Gun
Floor Jack

Rubber Mallet Ratchet Jack Stands 7/16" Wrench

Procedure:

/I WARNING

- **1.** Move the vehicle to a level surface.
- 2. Place the gear shift lever in REVERSE gear.
- **3.** Remove the front and rear floorboards and remove the engine cover. Disconnect the negative battery cable.
- 4. Raise the vehicle so the tires are off the ground.

Securely support the vehicle so there is no danger of it falling.

- 5. Place the vehicle in NEUTRAL gear.
- 6. Remove the tire from the axle with the bearing to be replaced.
- 7. Follow the removal procedure under the *Axle Replacement* section for the appropriate axle bearing to be replaced.
- 8. Upon removing the axle from the vehicle, determine which bearing needs to be replaced (inner chassis bearing or outer chassis bearing). Follow the appropriate section to replace the bearing:

Part I - Outer chassis Bearing Replacement Part II - Inner Chassis Bearing Replacement (Locking collar type) Part III - Inner Chassis Bearing Replacement (Turned down splined axle/non-locking collar type)

Part I - Outer Chassis Bearing Replacement

- **1.** Set the new bearing into the inner bearing flange. Make sure that the eccentric locking surface on the bearing is positioned towards the outside of the vehicle (towards the tire).
- 2. Install the nuts and lock washers which were removed during the axle removal. Do not tighten the nuts down at this time.
- **3.** Follow the steps for the installation procedure in the *Axle Replacement* section for the appropriate axle to be installed. Begin with Step 2.

Part II - Inner Chassis Bearing Replacement (Locking Collar Type)

- 1. Locate the four 3/8" bolts securing the inner bearing and flange assembly to the inner chassis rail. Remove the nuts and lock washers. Remove the outer flange and bearing.
- 2. Set the new inner bearing into the inner bearing flange. Make sure that the eccentric locking surface on the bearing is positioned towards the outside of the vehicle (towards the tire).
- **3.** Install the outer flange and the nuts and lock washers removed in step 1. Tighten these down hand tight.
- 4. Install the outer chassis bearing and flange as described in step 1 of the *Axle Replacement Installation* section. With the outer and new inner bearing loosely installed, slide the axle through both bearings. Tighten down the inner and outer bearing flange bolts to 23 ft-lbs. Once tight, the axle should slide in and out of both bearings with ease. If not, the bearings are not in line with each other. Slide the axle out of the inner bearing and tap the axle flange (where the wheel bolts to) with a rubber mallet to change the position of the outer bearing in the bearings with ease. Repeat this procedure until the bearings are aligned properly. Remove the axle and set it aside.

A CAUTION Failure to align bearings will result in vehicle damage.

- 5. Follow the installation procedure in the *Axle Replacement* section for the appropriate axle to be installed. Begin with step 2.
- ▲ CAUTION Do not over grease the inner bearing. It has been pre-lubed by the manufacturer. Too much grease will damage the bearing Be certain that the axle and bearing are aligned.

Part III - Inner Chassis Bearing Replacement

(Turned Down Splined Axle/Non-Locking Collar Type)

- 1. Locate the four 3/8" bolts securing the inner bearing and flange assembly to the inner chassis rail. Remove the nuts and lock washers. Remove the outer flange and bearing.
- 2. Set the new inner bearing into the inner bearing flange. Make sure that the set screw locking side on the bearing is positioned towards the outside of the vehicle (towards the tire). See Figure VI in the *Axle Replacement* section.
- **3.** Install the outer flange and the nuts and lock washers removed in step 1. Tighten these down hand tight.
- 4. Install the outer chassis bearing and flange as described in step 1 of the *Axle Replacement Installation* section. With the outer and new inner bearing loosely installed, slide the axle through both bearings. Tighten down the inner and outer bearing flange bolts to 23 ft-lbs. Once tight, the axle should slide in and out of both bearings with ease. If not, the bearings are not in line with each other. Slide the axle out of the inner bearing and tap the axle flange (where the wheel bolts to) with a rubber mallet to change the position of the outer bearing in the bearings with ease. Repeat this procedure until the bearings are aligned properly. Remove the axle and set it aside.

CAUTION Failure to align bearings will result in vehicle damage.

5. Follow the installation procedure in the *Axle Replacement* section for the appropriate axle to be installed. Begin with step 2.

▲ CAUTION Do not over grease the inner bearing. It has been pre-lubed by the manufacturer. Too much grease will damage the bearing Be certain that the axle and bearing are aligned.

CAUTION A CAUTION indicates special precautions that must be taken to avoid damage to the vehicle.

WARNING Failure to follow WARNING instructions <u>could result in severe injury or death</u> the vehicle operator, any passenger, or a bystander.

NOTE A note provides key information to make procedures more clear and easier.

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Axle Replacement

Tools Required:

WARNING

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	- I -				
	11/16"	Wrench	6" Extension		Steel Straight Edge
	9/16" \	Wrench	Ratchet		Pliers
	3/4" W	rench	Hammer		3/8" Hex Wrench
	3/4" Se	ocket	Drift Pin/Alignme	nt Tool	(Turned down front
	9/16" \$	Socket	5/32" Hex Wrench	ı	axles only)
	5/8" Se	ocket	Grease Gun		#271 Loctite® Thread
	locker	Torque	e Wrench	Jack S	tands
	Propar	ne Torch (Splin	ed Axle)		Floor Jack
	Standa	rd Screwdriver	Per	matex® A	nti-Seize
	Tape N	Aeasure			
	1/8" H	ex Wrench (Sp	lined Axles Only S	/N 17863 a	nd earlier)
Proce	dure:	× 1	2		,
	Note:	Read through identify which have been man	all of the instruction style axle you are ny axle design chan	ns before y replacing a iges in the j	ou begin. Be sure to and installing. There past.
	1.	Move the vehicle to a level surface.			
	2.	 Place the gear shift in REVERSE gear. Remove the floorboards and the engine cover. Disconnect the negative battery cable 			
	3.				
	4.	Raise the vehi	cle so the tires are o	off the grou	ınd.
	Secur	ely support the	e vehicle so there is	s no dange	er of it falling.

- **5.** Place the vehicle in NEUTRAL gear.
- **6.** Remove the tire from the axle to be replaced.
- 7. Proceed to Part I for front axle replacement, Part II for center axle replacement, and Part III for rear axle replacement.

Part I - Front Axle Replacement

Removal

- 1. Unbolt the disk brake caliper and mounting bracket assembly from the chassis. The bracket is attached by two 5/16" bolts, one at the front and one at the rear of the mounting bracket. Be sure to keep track of any shims removed.
- **2.** Pull the caliper and mounting bracket assembly up and slide it off the brake rotor.
- **3.** Measure the distance from the outer chassis rail to the edge of the sprocket. Write this measurement down as it will be needed later in order to realign the chain(s). (See Figure IA).

\bigwedge CAUTION Failure to align the chains will result in vehicle damage.

- 4. Loosen the set screw on the inner bearing locking collar with the hex wrench. If your vehicle has a Serial Number of 15632 or later or if the axle has been replaced in the past with a 'turned down end' splined axle, proceed to step 4a. Unlock the locking collar using a hammer and a drift pin. To unlock the collar, place the drift pin in the locking hole (not the set screw hole) and tap it with the hammer so that the collar will spin in the same direction that the axle rotates when the vehicle is moving backwards. Once loose, slide the locking collar away from the bearing.
 - **4a.** Locate the steering lever plates at the front of the chassis. If you have a Serial Number of 15632 or later, you will have access holes in these plates for the bolt threaded into the end of the front axle. If not, locate the four bolts securing the steering lever plates to the front of the chassis. Remove these four bolts as well as the two clevis pins (one at the base of each steering rod) and move the steering lever assembly out of the way in order to gain access to the bolt threaded into the end of the front axle. Remove this bolt from the end of the axle to be removed/replaced. Loosen the two set screws on the inner bearing (see Figure VI).
- 5. Using an 11/16" wrench and a 5/8" socket, remove the axle bolt from the disk and sprocket assembly. You may need to tap the bolt out of the axle with a drift pin. If you have splined axles and O-Ring chain, remove the two set screws in the sprocket hub and disk hub (S/N 17864 and later will have one large set screw). This will unlock the sprocket/disk from the axle.

Note: There are two set screws secured with Loctite® in each hub. You must apply heat (400°F for 5 minutes) to these before removal.

WARNING Use caution while applying heat to parts. Do not use heat near any fuel lines or near the battery or an explosion may occur. Do not touch any heated parts until they have cooled.

- 6. Locate the four, 3/8" nuts and lock washers which secure the outer bearing flange to the chassis. Remove these nuts and lock washers.
- 7. Remove the axle from the vehicle. The outer bearing, flange, and locking collar should remain on the axle. You may need to tap the axle out with a hammer by tapping on the back side of the wheel flange (the plate the wheel bolts to). If you have an axle with a 'turned down' end, keep track of any thick and/or thin shims and the order in which they are on the axle. This will allow proper sprocket alignment during the assembly process.

Note: If the axle will not come out, you may have to loosen the chains. Please refer to your *Operators Manual* for chain tensioning instructions and location of the chain adjusters. To loosen the chains, simply loosen idler sprocket bolts with a 3/4" wrench, 3/4" socket, and ratchet.

Note: Over time, there is a possibility of the axle becoming rusted to the inner bearing or sprocket/disk assembly. In this case, the axle must be cut with a grinding wheel or Sawzall. After the axle is cut and removed, remove the bearing or sprocket assembly from the chassis (see the *Bearing Replacement* section or *Sprocket Replacement* section of the service manual) and replace it with a new bearing or sprocket assembly if necessary.

Always wear safety glasses when cutting metal objects.

8. Once the axle is removed, place it on a table or bench and in a vise if possible. Loosen the set screw on the locking collar. Unlock the locking collar using a hammer and a drift pin. To unlock the collar, place the drift pin in the locking hole (not the set screw hole) and tap it with the hammer so that the collar will spin in the same direction that the axle rotates when the vehicle is moving backwards. Once loose, slide the locking collar away from the bearing. Remove the bearing, flange, and locking collar from the axle.

NOTE

Installation

- 1. Reinstall the outer chassis bearing and flange, which was removed with the axle assembly, to the chassis. Be sure that the eccentric locking surface on the bearing is facing towards the outside of the vehicle and that the grease fitting on the outer flange is towards the top of the vehicle. Loosely install the lock washers and nuts onto the four, 3/8" bolts. These will be tightened down later.
- 2. Place the outer locking collar on the axle (the one from the outer chassis bearing). Make sure that the recessed portion on the locking collar is facing the vehicle body. Coat the Axle Shaft with Anti-Seize.

Note: If you are installing a new splined axle in a vehicle with a Serial Number of 15631 or earlier, you must change the inner bearing prior to installing the new axle. Please refer to the *Bearing Replacement* section in order to install the appropriate inner axle bearing.

- 3. Insert the axle into the outer chassis bearing. Slide the axle through the sprocket assembly or sprocket and disk assemblies if your vehicle has splined axles. If you are installing a new splined axle in a vehicle with a Serial Number of 15632 or later, place the shims removed in step 7 of the removal procedure (always use new thin shims) on the turned down portion of the axle (see Figure VI). If you have an earlier vehicle and are replacing a splined axle with a new splined axle, place one thick shim on the turned down portion of the axle (see Figure VI). If you are reinstalling the original axle in a vehicle with a Serial Number of 15631 or earlier, place the inner bearing locking collar on the end of the axle with the recessed portion facing the bearing. Make sure that the set screw on the sprocket/disk hub will be on the same spline as the holes in the axle shaft and that the sprocket and disk hubs are oriented correctly as shown in Figure II if your vehicle has splined axles. Slide the axle into the inner bearing. If you did not loosen the chains in step 7 of the removal procedure and the sprocket assembly will not line up with the axle, loosen the chains as described in step 7.
- 4. With the axle in place, tighten down the four nuts which were installed on the outer bearing flange assembly. These should be tightened down to 23 ft-lbs.

Failure to tighten down hardware will result in vehicle damage.



5. Place the axle bolt into the sprocket and through the axle. Tighten the nut down to 30 ft-lbs. If you have splined axles, line up the sprocket/disk hub with the correct axle hole (see Figure II). Double set screw each hub in place (S/N 17864 or later or any new sprocket will have one large set screw). Be sure to put #271 Loctite® on the set screw threads.

CAUTION Failure to tighten down hardware will result in vehicle damage.

6. If you are installing a solid (not splined) or hollow axle or reinstalling an axle on a vehicle with a Serial Number of 15631 or earlier, slide the axle and sprocket assembly in or out of the vehicle until you obtain the same measurement as written down from step 3 of the removal procedure. This will give you proper chain alignment. If you are installing a new splined axle or reinstalling a splined axle on a vehicle with a Serial Number of 15632 or later, slide the axle in all of the way until the shims are seated tightly against the inner bearing. Measure for sprocket alignment and add or remove shims (thick or thin) until the same measurement as written down in step 3 of the removal procedure is obtained. Always make sure the axle is in towards the center of the vehicle all of the way when taking the measurements. This will give you proper chain alignment. All chains and sprockets must be aligned properly. If the chains are not aligned, equipment failure will result. Double check the alignment by measuring from the outer chassis rail to the outer center sprocket (see Figure IA). This should be the same as the measurement for the front sprocket that was written down in step 3.

CAUTION

Failure to align the chains will result in vehicle damage.

7. If you have installed a new splined axle or reinstalled a splined axle in a vehicle with a Serial Number of 15632 or later, proceed to step 7a. Tighten the outer chassis bearing locking collar. Use the following procedure: Turn the collar by hand in the same direction that the axle rotates when the vehicle is moving forward. Rotate the collar until it is snug on the bearing. Lock the collar using a hammer and drift pin. To lock the collar, place the drift pin in the locking hole (not the set screw hole) and tap it with a hammer (in the same direction as mentioned above) with 4 or 5 firm taps. Tighten down the set screw using a hex wrench. Repeat this procedure on the inner bearing if so equipped. Be sure that the inner locking collar set screw will sit square on a high or low point of the axle spline if your vehicle is equipped with splined axles.

- 7a. If you are installing a new splined axle or reinstalling an axle on a vehicle with a Serial Number of 15632 or later, secure the axle to the bearing using a bolt, lock washer, and flat washer as shown in Figure VI (the front axles use socket head bolts and no lock washers). Be sure to put some #271 Loctite® on the bolt and tighten it down to 30 ft-lbs. Tighten down the two inner bearing set screws. Proceed to tighten down the outer bearing locking collar as described in step 7 above. The move on to step 8.
- 8. Grease the outer and inner bearings with one or two pumps of grease with a grease gun. If an inner bearing was replaced, do not grease it at this time. New bearings have been pre-lubed by the manufacturer.

ACAUTION Too much grease in a bearing will damage the bearing seals.

- **8a.** If the steering plates were removed in step 4a, reinstall them at this time. Also, reinstall the steering rods on to the steering levers using the clevis pins which were removed.
- **9.** Now double check the alignment of the front idler sprocket (adjuster sprocket). Measure from the outer chassis rail to the center (of the width) of the front axle sprocket. With the idler sprocket bolt snug, measure from the outer chassis rail to the center of the idler sprocket (see Figure IB). Move the shims for the idler sprocket around until you have the same measurement as the outer chassis rail to the center of the front sprocket.
- **10.** Reinstall the disk brake caliper onto the brake rotor. Be sure to replace any shims that were removed. Install the hardware and tighten until the nuts are just snug. Make sure that the top of the caliper mounting bracket is centered between the inner brake pad plate and the outer caliper plate. Tighten down the nuts to 10 ft-lbs.

WARNING Failure to install the brake caliper properly can cause loss of control of the vehicle.

11. Adjust the chains as described in your owner's manual.

\triangle CAUTION Failure to properly adjust chains will result in vehicle damage.

12. Reinstall the tire on the axle. Tighten down the lug nuts to 55 ft lbs.

13. Reconnect the negative battery cable and install the floorboards and engine cover.

Part II - Center Axle Replacement

Removal

1. Measure the distance from the outer chassis rail to the edge of the outer sprocket. Write this measurement down as it will be needed later in order to realign the chain(s). (See Figure IA)

\triangle CAUTION Failure to align the chains will result in vehicle damage.

- 2. Loosen the set screw on the inner bearing locking collar with the hex wrench. If your vehicle has a Serial Number of 15632 or later or if the axle has been replaced in the past with a 'turned down end' splined axle, proceed to step 2a. Unlock the locking collar using a hammer and a drift pin. To unlock the collar, place the drift pin in the locking hole (not the set screw hole) and tap it with the hammer so that the collar will spin in the same direction that the axle rotates when the vehicle is moving backwards. Once loose, slide the locking collar away from the bearing.
 - 2a. Remove the bolt from the end of the axle to be removed/replaced. Loosen the two set screws on the inner bearing (see Figure VI).
- **3.** Using an 11/16" wrench and a 5/8" socket, remove the axle bolt from the sprocket assembly. You may need to tap the bolt out of the axle with a drift pin. If you have O-Ring chain and splined axles, remove the two set screws in the sprocket hubs (S/N 17864 and later will have one large set screw). This will unlock the center sprocket assemblies from the axle.

Note: There are two set screws secured with Loctite® in each hub. You must apply heat (400^oF for 5 minutes) to these before removal.

WARNING Use caution while applying heat to parts. Do not use heat near any fuel lines or near the battery or an explosion may occur. Do not touch any heated parts until they have cooled.

4. Locate the four, 3/8" nuts and lock washers which secure the outer bearing flange to the chassis. Remove these nuts and lock

washers.

5.	Remove the axle from the vehicle. The outer bearing, flange, and
	locking collar should remain on the axle. You may need to tap the
	axle out with a hammer by tapping on the back side of the wheel
	flange (the plate the wheel bolts to). If you have an axle with a
	'turned down' end, keep track of any thick and/or thin shims and
	the order in which they are on the axle. This will allow proper
	sprocket alignment during the assembly process.

- **Note:** If the axle will not come out, you may have to loosen the chains. Please refer to your *Operators Manual* for chain tensioning instructions and location of the chain adjusters. To loosen the chains, simply loosen idler sprocket bolts with a 3/4" wrench, 3/4" socket, and ratchet.
- **Note:** Over time, there is a possibility of the axle becoming rusted to the inner bearing or sprocket assembly. In this case, the axle must be cut with a grinding wheel or Sawzall. After the axle is cut and removed, remove the bearing or sprocket assembly from the chassis (see the *Bearing Replacement* section or *Sprocket Replacement* section of the service manual) and replace it with a new bearing or sprocket assembly if necessary.

Always wear safety glasses when cutting metal objects.

6. Once the axle is removed, place it on a table or bench and in a vise if possible. Loosen the set screw on the locking collar. Unlock the locking collar using a hammer and a drift pin. To unlock the collar, place the drift pin in the locking hole (not the set screw hole) and tap it with the hammer so that the collar will spin in the same direction that the axle rotates when the vehicle is moving backwards. Once loose, slide the locking collar away from the bearing. Remove the bearing, flange, and locking collar from the axle.

Installation

NOTE

- 1. Reinstall the outer chassis bearing and flange, which was removed with the axle assembly, to the chassis. Be sure that the eccentric locking surface on the bearing is facing towards the outside of the vehicle and that the grease fitting on the outer flange is towards the top of the vehicle. Loosely install the lock washers and nuts onto the four, 3/8" bolts. These will be tightened down later.
- 2. Place the outer locking collar on the axle (the one from the outer chassis bearing). Make sure that the recessed portion on the

locking collar is facing the vehicle body. Coat the Axle Shaft with Anti-Seize.

- **Note:** If you are installing a new splined axle in a vehicle with a Serial Number of 15631 or earlier, you must change the inner bearing prior to installing the new axle. Please refer to the *Bearing Replacement* section in order to install the appropriate inner axle bearing.
- 3. Insert the axle into the outer chassis bearing. Slide the axle through the sprocket assembly or sprocket and disk assemblies if your vehicle has splined axles. If you are installing a new splined axle in a vehicle with a Serial Number of 15632 or later, place the shims removed in step 5 of the removal procedure (always use new thin shims) on the turned down portion of the axle (see Figure VI). If you have an earlier vehicle and are replacing a splined axle with a new splined axle, place one thick shim on the turned down portion of the axle (see Figure VI). If you are reinstalling the original axle in a vehicle with a Serial Number of 15631 or earlier, place the inner bearing locking collar on the end of the axle with the recessed portion facing the bearing. Make sure that the set screw on the sprocket/disk hub will be on the same spline as the holes in the axle shaft and that the sprocket and disk hubs are oriented correctly as shown in Figure II if your vehicle has splined axles. Slide the axle into the inner bearing. If you did not loosen the chains in step 5 of the removal procedure and the sprocket assembly will not line up with the axle, loosen the chains as described in step 5.
- 4. With the axle in place, tighten down the four nuts which were installed on the outer bearing flange assembly. These should be tightened down to 23 ft-lbs.

CAUTION Failure to tighten down hardware will result in vehicle damage.

5. Place the axle bolt into the sprocket and through the axle. Tighten the nut down to 30-foot pounds. If you have splined axles, line up the sprocket hub with the correct axle hole (see Figure II). Double set screw the sprocket hub in place (S/N 17864 or later or any new sprocket will have one large set screw). Be sure to put #271 Loctite® on the set screw threads.

CAUTION Failure to tighten down hardware will result in vehicle damage.

6. If you are installing a solid (not splined) or hollow axle or reinstalling an axle on a vehicle with a Serial Number of 15631 or

earlier, slide the axle and sprocket assembly in or out of the vehicle until you obtain the same measurement as written down from step 1 of the removal procedure. This will give you proper chain alignment. If you are installing a new splined axle or reinstalling a splined axle on a vehicle with a Serial Number of 15632 or later, slide the axle in all of the way until the shims are seated tightly against the inner bearing. Measure for sprocket alignment and add or remove shims (thick or thin) until the same measurement as written down in step 1 of the removal procedure is obtained. Always make sure the axle is in towards the center of the vehicle all of the way when taking the measurements. This will give you proper chain alignment. All chains and sprockets must be aligned properly. If the chains are not aligned, equipment failure will result. Double check the alignment by measuring from the outer chassis rail to the outer center sprocket (see Figure IA). This should be the same as the measurement for the front sprocket that was written down in step 1.

CAUTION Failure to align the chains will result in vehicle damage.

- 7. If you have installed a new splined axle or reinstalled a splined axle in a vehicle with a Serial Number of 15632 or later, proceed to step 7a. Tighten the outer chassis bearing locking collar. Use the following procedure: Turn the collar by hand in the same direction that the axle rotates when the vehicle is moving forward. Rotate the collar until it is snug on the bearing. Lock the collar using a hammer and drift pin. To lock the collar, place the drift pin in the locking hole (not the set screw hole) and tap it with a hammer (in the same direction as mentioned above) with 4 or 5 firm taps. Tighten down the set screw using a hex wrench. Repeat this procedure on the inner bearing if so equipped. Be sure that the inner locking collar set screw will sit square on a high or low point of the axle spline if your vehicle is equipped with splined axles.
 - 7a. If you are installing a new splined axle or reinstalling an axle on a vehicle with a Serial Number of 15632 or later, secure the axle to the bearing using a bolt, lock washer, and flat washer as shown in Figure VI (the front axles use socket head bolts and no lock washers). Be sure to put #271 Loctite® on the bolt and tighten it down to 30 ft-lbs. Tighten down the two inner bearing set screws. Proceed to tighten down the outer bearing locking collar as described in step 7 above. The move on to step 8.
- 8. Grease the outer and inner bearings with one or two pumps of grease with a grease gun. If an inner bearing was replaced, do not

grease it at this time. New bearings have been pre-lubed by the manufacturer.

ACAUTION Too much grease in a bearing will damage the bearing seals.

- 9. Now double check the alignment of the front (between the front and center axles) and center idler (between the center and rear axles) sprockets (adjuster sprocket). Measure from the outer chassis rail to the center (of the width) of the outer center axle sprocket. With the idler sprocket bolt snug, measure from the outer chassis rail to the center of the front idler sprocket (see Figure IB). Move the shims for the idler sprocket around until you have the same measurement as the outer chassis rail to the center of the outer center axle sprocket. Repeat this procedure for the center idler sprocket. Be sure to measure to the inner center axle sprocket for aligning the center idler sprocket.
- **10.** Adjust the chains as described in your owner's manual.

CAUTION Failure to properly adjust chains will result in vehicle damage.

- **11.** Reinstall the tire on the axle. Tighten down the lug nuts to 55 ft-lbs.
- **12.** Reconnect the negative battery cable, install the floorboards and the engine cover.

Part III - Rear Axle Replacement

Removal

1. Measure the distance from the outer chassis rail to the edge of the outer rear sprocket. Write this measurement down as it will be needed later in order to realign the chain(s). (See Figure IA).

CAUTION

Failure to align the chains will result in vehicle damage.

2. Loosen the set screw on the inner bearing locking collar with the hex wrench. If your vehicle has a Serial Number of 15632 or later or if the axle has been replaced in the past with a 'turned down end' splined axle, proceed to step 2a. Unlock the locking collar using a hammer and a drift pin. To unlock the collar, place the drift pin in the locking hole (not the set screw hole) and tap it with the hammer so that the collar will spin in the same direction that the axle rotates when the vehicle is moving backwards. Once loose, slide the locking collar away from the bearing.

- **2a.** Remove the bolt from the end of the axle to be removed/replaced. Loosen the two set screws on the inner bearing (see Figure VI).
- **3.** Using an 11/16" wrench and a 5/8" socket, remove the axle bolt from the disk and sprocket assembly. You may need to tap the bolt out of the axle with a drift pin. If you have splined axles and O-Ring chain, remove the two set screws in the sprocket hubs (S/N 17864 and later will have one large set screw). This will unlock the sprockets assembly from the axle.
 - **Note:** There are two set screws secured with Loctite® in each hub. You must apply heat (400°F for 5 minutes) to these before removal.

WARNING Use caution while applying heat to parts. Do not use heat near any fuel lines or near the battery or an explosion may occur. Do not touch any heated parts until they have cooled.

- **4.** Locate the four, 3/8" nuts and lock washers which secure the outer bearing flange to the chassis. Remove these nuts and lock washers.
- 5. Remove the axle from the vehicle. The outer bearing, flange, and locking collar should remain on the axle. You may need to tap the axle out with a hammer by tapping on the back side of the wheel flange (the plate the wheel bolts to). If you have an axle with a 'turned down' end, keep track of any thick and/or thin shims and the order in which they are on the axle. This will allow proper sprocket alignment during the assembly process.
 - **Note:** If the axle will not come out, you may have to loosen the chains. Please refer to your *Operators Manual* for chain tensioning instructions and location of the chain adjusters. To loosen the long (final drive) chains, simply loosen idler sprocket bolts with a 3/4" wrench, 3/4" socket, and ratchet. To loosen the rear (short) chain, loosen the jam nut on the rear adjuster bolt (protruding through the angle on the rear of the chassis) and then loosen the adjuster nut with a 3/4" wrench. If you have lock washers and standard nuts on the two idler bracket bolts (3/8" bolts securing the rear idler assembly to the chassis) and on the idler sprocket bolt, you must loosen these also.

Note: Over time, there is a possibility of the axle becoming rusted to the inner bearing or sprocket assembly. In this case, the axle must be cut with a grinding wheel or Sawzall. After the axle is cut and removed, remove the bearing or sprocket assembly from the chassis (see the *Bearing Replacement* section or *Sprocket Replacement* Section of the service manual) and replace it with a new bearing or sprocket assembly if necessary.

Always wear safety glasses when cutting metal objects.

6. Once the axle is removed, place it on a table or bench and in a vise if possible. Loosen the set screw on the locking collar. Unlock the locking collar using a hammer and a drift pin. To unlock the collar, place the drift pin in the locking hole (not the set screw hole) and tap it with the hammer so that the collar will spin in the same direction that the axle rotates when the vehicle is moving backwards. Once loose, slide the locking collar away from the bearing. Remove the bearing, flange, and locking collar from the axle.

Installation

NOTE

- 1. Reinstall the outer chassis bearing and flange, which was removed with the axle assembly, to the chassis. Be sure that the eccentric locking surface on the bearing is facing towards the outside of the vehicle and that/the grease fitting on the outer flange is towards the top of the vehicle. Loosely install the lock washers and nuts onto the four, 3/8" bolts. These will be tightened down later.
- 2. Place the outer locking collar on the axle (the one from the outer chassis bearing). Make sure that the recessed portion on the locking collar is facing the vehicle body. Coat the Axle Shaft with Anti-Seize.
 - **Note:** If you are installing a new splined axle in a vehicle with a Serial Number of 15631 or earlier, you must change the inner bearing prior to installing the new axle. Please refer to the *Bearing Replacement* section in order to install the appropriate inner axle bearing.
- 3. Insert the axle into the outer chassis bearing. Slide the axle through the sprocket assembly or sprocket and disk assemblies if your vehicle has splined axles. If you are installing a new splined axle in a vehicle with a Serial Number of 15632 or later, place the shims removed in step 5 of the removal procedure (always use new

thin shims) on the turned down portion of the axle (see Figure VI). If you have an earlier vehicle and are replacing a splined axle with a new splined axle, place one thick shim on the turned down portion of the axle (see Figure VI). If you are reinstalling the original axle in a vehicle with a Serial Number of 15631 or earlier, place the inner bearing locking collar on the end of the axle with the recessed portion facing the bearing. Make sure that the set screw on the sprocket/disk hub will be on the same spline as the holes in the axle shaft and that the sprocket and disk hubs are oriented correctly as shown in Figure II if you did not loosen the chains in step 5 of the removal procedure and the sprocket assembly will not line up with the axle, loosen the chains as described in step 5.

4. With the axle in place, tighten down the four nuts which were installed on the outer bearing flange assembly. These should be tightened down to 23 ft-lbs.

CAUTION Failure to tighten down hardware will result in vehicle damage.

5. Place the axle bolt into the sprocket and through the axle. Tighten the nut down to 30-foot pounds. If you have splined axles, line up the sprocket hub with the correct axle hole (see Figure II). Double set screw the sprocket hub in place (S/N 17864 or later or any new sprocket will have one large set screw). Be sure to put #271 Loctite® on the set screw threads.

CAUTION

Failure to tighten down hardware will result in vehicle damage.

6. If you are installing a solid (not splined) or hollow axle or reinstalling an axle on a vehicle with a Serial Number of 15631 or earlier, slide the axle and sprocket assembly in or out of the vehicle until you obtain the same measurement as written down from step 1 of the removal procedure. This will give you proper chain alignment. If you are installing a new splined axle or reinstalling a splined axle on a vehicle with a Serial Number of 15632 or later, slide the axle in all of the way until the shims are seated tightly against the inner bearing. Measure for sprocket alignment and add or remove shims (thick or thin) until the same measurement as written down in step 1 of the removal procedure is obtained. Always make sure the axle is in towards the center of the vehicle all of the way when taking the measurements. This will give you proper chain alignment. All chains and sprockets must be aligned properly. If the chains are not aligned, equipment failure will result.

7. Double check the alignment by measuring from the outer chassis rail to the inner center sprocket (see Figure IA). This should be the same as the measurement for the outer rear sprocket that was written down in step 1. Also, double check the alignment of the 34 tooth (large) rear sprocket to the transmission sprocket. Loosen the chain for these two sprockets (as described in step 5 of the removal procedure) and remove the chain. Be sure to keep track of the orientation of the master link. You may have to pry the master link plate off with a standard screwdriver. Lay a steel straight edge along the outside of the transmission sprocket and the outside edge of the large (34 tooth) rear sprocket (see Figure III). If you have a non-splined solid axle or a hollow axle, tap the axle in or out until the sprockets are in line. If you have a Serial Number of 15632 or later and splined axles or if you are replacing a splined axle with a new 'turned down end' axle, add or remove thick or thin shims in order to gain proper alignment. Repeat this process with the straight edge on the inside edge of both sprockets (see Figure IV).

> **Note:** If there is a gap on one side of the 34-tooth sprocket while the other side is flush with the straight edge, move the axle so there is a smaller gap on between both sides of the 34-tooth sprocket and the straight edge. Sprocket thickness may vary due to machining tolerances.

Failure to align the chains will result in vehicle damage.

/ CAUTION

- 8. Once the alignment of the 34-tooth rear sprocket and the transmission sprocket has been verified, measure from the outer chassis rail to the outer rear sprocket (see Figure 1A). If this is the same as the measurement written down in step 1 of the removal procedure, proceed to step 9. If not, use this new measurement to align the center axle inner sprocket with the rear axle outer sprocket and then align the center axle outer sprocket with the front axle sprocket. Refer to the center and front axle replacement sections in order to properly align these axles.
- **9.** If you have installed a new splined axle or reinstalled a splined axle in a vehicle with a Serial Number of 15632 or later, proceed to step 9a. Tighten the outer chassis bearing locking collar. Use the following procedure: Turn the collar by hand in the same direction that the axle rotates when the vehicle is moving forward. Rotate the collar until it is snug on the bearing. Lock the collar using a hammer and drift pin. To lock the collar, place the drift pin in the locking hole (not the set screw hole) and tap it with a hammer (in the same direction as mentioned above) with 4 or 5 firm taps.

Tighten down the set screw using a hex wrench. Repeat this procedure on the inner bearing if so equipped. Be sure that the inner locking collar set screw will sit square on a high or low point of the axle spline if your vehicle is equipped with splined axles.

- 9a. If you are installing a new splined axle or reinstalling an axle on a vehicle with a Serial Number of 15632 or later, secure the axle to the bearing using a bolt, lock washer, and flat washer as shown in Figure VI (the front axles use socket head bolts and no lock washers). Be sure to put #271 Loctite® on the bolt and tighten it down to 30 ft-lbs. Tighten down the two inner bearing set screws. Proceed to tighten down the outer bearing locking collar as described in step 9 above. The move on to step 10.
- **10.** Grease the outer and inner bearings with one or two pumps of grease with a grease gun. If an inner bearing was replaced, do not grease it at this time. New bearings have been pre-lubed by the manufacturer.

CAUTION Too much grease in a bearing will damage the bearing seals.

- 11. Now double check the alignment of the center (between the center and rear axles) and rear idler (on the short/primary chain) sprockets (adjuster sprocket). Measure from the outer chassis rail to the center (of the width) of the outer rear axle sprocket. With the idler sprocket bolt snug, measure from the outer chassis rail to the center of the center idler sprocket (see Figure IB). Move the shims for the idler sprocket around until you have the same measurement as the outer chassis rail to the center of the outer center axle sprocket. Now, snug all the hardware on the rear adjuster assembly. Using a straight edge, align both sides of the rear idler sprocket with the transmission output sprocket (see Figure V). There should be a small gap (1/32" to 1/16") between the idler sprocket and the straight edge on both sides. Move the idler shims to obtain proper alignment.
- 12. Reinstall the rear (short) primary chain. You may have to use a pair of pliers to get the master link plate on the master link pins. Adjust the chains as described in your owner's manual. Be sure to tighten down all the hardware that was loosened on the rear idler assembly after adjusting the chains.

CAUTION Failure to properly adjust chains will result in vehicle damage.

13. Reinstall the tire on the axle. Tighten down the lug nuts to

55 ft-lbs.

14. Reconnect the negative battery cable and install the floorboards and engine cover.

CAUTION A CAUTION indicates special precautions that must be taken to avoid damage to the vehicle.

WARNING Failure to follow WARNING instructions <u>could result in severe injury or death</u> the vehicle operator, any passenger, or a bystander.

NOTE A note provides key information to make procedures more clear and easier.





FIGURE II









MAX IV

MAX IV Sprocket.doc 1/14/05

Sprocket Replacement

For Non-Snap Ring Style Sprockets

Tools Required:

5/8" Socket (hollow or solid/non-splined axles only) 11/16" Wrench (hollow or solid/non-splined axles only) 7/16" Wrench 1/8" and 3/16" Hex Wrench (splined axles only) Ratchet Torque Wrench Floor Jack Jack Stands

Procedure:

- **1.** Move the vehicle to a level surface.
- 2. Place the gear shift lever in REVERSE gear.
- **3.** Remove the front and rear floorboards and remove the engine cover. Disconnect the negative battery cable.
- 4. Raise the vehicle so the tires are off the ground.

WARNING

Securely support the vehicle so there is no danger of it falling.

- 5. Place the vehicle in NEUTRAL gear.
- 6. Remove the tire from the axle with the sprocket to be replaced.
- 7. Follow the removal procedure under the *Axle Replacement* section for the appropriate sprocket to be replaced.
- 8. Please follow the appropriate section for sprocket replacement.
 Part I Front sprocket replacement.
 Part II Center sprocket replacement.
 Part III Rear sprocket replacement.

Part I - Front Sprocket Replacement

- 1. Once the axle has been removed (see the *Axle Replacement section* for the front axle), unwrap the front drive chain from the sprocket assembly and lift the sprocket out of the vehicle.
- 2. Inspect the chain as well as the parking/auxiliary brake system for wear. It is common for a loose or worn-out chain to cause sprocket failure. Replace any worn items if necessary.

CAUTION Failure to replace worn parts will result in damage to the vehicle.

3. Wrap the chain around the new sprocket assembly. Proceed to the front axle installation section of the *Axle Replacement* section of the manual.

Part II - Center Sprocket Replacement

- 1. Once the axle has been removed (see the *Axle Replacement* section for the center axle), unwrap the chain(s) from the sprocket assembly(s) and lift the center sprocket assembly(s) out of the vehicle.
- 2. Inspect the chain(s) for wear. It is common for a loose or worn-out chain to cause sprocket failure. Replace any worn items if necessary.

CAUTION Failure to replace worn parts will result in damage to the vehicle.

3. Wrap the chain(s) around the new sprocket assembly(s). Proceed to the center axle installation section of the *Axle Replacement* section of the manual.

Part III - Rear Sprocket Replacement

- 1. Once the axle has been removed (see the *Axle Replacement* section for the rear axle), unwrap the rear drive chain(s) from the sprocket assembly(s) and lift the sprocket(s) out of the vehicle.
- 2. Inspect the rear chain(s) for wear. It is common for a loose or worn-out chain to cause sprocket failure. Replace any worn items if necessary.

CAUTION Failure to replace worn parts will result in damage to the vehicle.

3. Wrap the chain(s) around the new sprocket assembly(s). Proceed to the rear axle installation section of the *Axle Replacement* section of the manual.

CAUTION A CAUTION indicates special precautions that must be taken to avoid damage to the vehicle.

WARNING Failure to follow WARNING instructions <u>could result in severe injury or death</u> the vehicle operator, any passenger, or a bystander.

NOTE A note provides key information to make procedures more clear and easier.

Max IV Front Axle Replacement For models after Serial Number 19417 and all Snap-Ring style axle replacements.

03/16/06

Max IV Snap Ring Front Axle replacement.doc

Tools required:

9/16" Wrench	6" Extension	¹ / ₂ " socket
3/4" Wrench	Ratchet	Hammer
3/4" Socket	Drift Pin	9/16" Socket
Hex Wrench Set	Grease Gun	Tape Measure
Torque Wrench	Floor Jack	Jack Stands
Standard Screwdriver	Permatex [®] Anti-Seize	¹ / ₂ " Wrench
Rubber Mallet	#271 Loctite [®] Thread locker	
Heavy Duty Snap Ring Pliers	(Recreatives P/N 45011 with	tips P/N 45012)

Procedure

Read through all instructions before you begin.

- **1.** Move the vehicle to a level surface.
- 2. Place the vehicle in reverse gear.
- **3.** Remove the floorboards and engine cover. Disconnect the negative battery cable.
- 4. Raise the vehicle so the tires are off the ground.

A WARNING

Securely support the vehicle so there is no danger of it falling.

- 5. Place the vehicle in NEUTRAL gear.
- 6. Remove the tire from the axle to be replaced.

Front Axle Replacement

Removal

1. Measure the distance from the outer chassis rail to the edge of the front sprocket. Write this measurement down as it will be needed later in order to realign the chain(s). (See Figure IA).

A CAUTION:

Failure to align the chains will result in vehicle damage.

- 2. Loosen the front chain adjuster assembly for the front chain.
- 3. Remove the front chain (122 link) from the front sprocket and center sprocket.
- 4. Locate the front and rear brake caliper mounting bolts on the brake caliper mounting bracket. These bolts secure the brake caliper assembly to the chassis. Using a ¹/₂" wrench and socket, remove both bolts. Keep track of the washers/shims. Lift the caliper assembly off of the brake rotor and rest it in front of the front chassis rail.
- 5. Locate the access hole in the steering lever plate to access the axle end bolt. Using a 3/8" hex wrench, remove the bolt from the end of the axle. Loosen the two set screws on the inner bearing (see Figure V).
- 6. Locate the four, 3/8" nuts and lock washers on the outside of the body, which secure the outer bearing flange to the chassis.Remove these nuts and lock washers. Slide the axle out until the sprocket is in contact with the frame.
- 7. Locate the inner sprocket assembly snap ring (next to the inner most edge of the sprocket/disk assembly). Using the <u>proper</u> snap ring pliers, loosen the snap ring and begin to walk it towards the end of the axle. As the inner snap ring is walked off the axle end, remove the bearing shims (thick and/or thin) on the end of the axle and set them aside. Keep track of these shims and the order in which they are on the axle. This will help in proper alignment during the assembly process.



Failure to use the proper snap ring pliers can result in serious injury.

- 8. Remove the axle from the vehicle. The outer bearing, flange, locking collar, outer sprocket snap ring, and any sprocket shims should remain on the axle. Keep track of the sprocket shim(s) and their order on the axle. You may need to tap the axle out with a hammer by tapping on the back side of the wheel flange (the plate the wheel bolts to). The sprocket assembly will remain in the vehicle.
 - **Note:** Over time, there is a possibility of the axle becoming rusted to the inner bearing or sprocket assembly. In this case, the axle must be cut with a grinding wheel. After the axle is cut and removed, remove the bearing or sprocket assembly from the chassis (see the *Bearing Replacement* section or *Sprocket Replacement* Section of the service manual) and replace it with a new bearing or sprocket assembly if necessary.

Always wear safety glasses when cutting metal objects.

9. Once the axle is removed, place it on a table or bench and in a vise if possible. Remove the sprocket shim(s) and the outer sprocket snap ring using the proper snap ring pliers. Keep track of sprocket shim(s) as it will be used later during the installation. Loosen the set screw on the locking collar on the outer bearing. Unlock the locking collar using a hammer and a drift pin. To unlock the collar, place the drift pin in the locking hole (not the set screw hole) and tap it with the hammer so that the collar will spin in the same direction that the axle rotates when the vehicle is moving backwards. Once loose, slide the locking collar away from the bearing. Remove the bearing, flange, and locking collar from the axle.

Installation

- 1. Refer to the *Front Sprocket Snap-Ring Style Replacement Instructions* for sprocket inspection and sprocket shimming before proceeding to the next step.
- 2. Inspect the paper flange gasket located between the outer steel bearing flanges. Replace if necessary. Reinstall the outer chassis bearing and flange, which was removed with the axle assembly, to the chassis. Be sure that the eccentric locking surface on the bearing is facing towards the outside of the vehicle and that the grease fitting on the outer flange is towards the top of the vehicle. Loosely install the lock washers and nuts onto the four, 3/8" bolts. These will be tightened down later.

- 3. Place the outer locking collar on the axle (the one from the outer chassis bearing). Make sure that the recessed portion on the locking collar is facing the vehicle body. Coat the axle shaft with Anti-Seize.
- 4. Insert the axle into the outer chassis bearing. Install the outer sprocket snap ring and sprocket shim(s) onto the end of the axle. Do not place the snap ring into the outer groove yet. Slide the axle through the sprocket assembly. Carefully slide the snap ring, appropriate sprocket shim(s), and sprocket assembly along the axle shaft until the snap ring locks securely into the outer snap ring groove. Slide on the inner snap ring only part way. Place the inner bearing shims, removed in step 7 of the removal procedure, on the turned down portion of the axle (see Figure V). Slide the axle into the inner bearing. Proceed to slide the inner snap ring along the axle shaft until it locks into the inner snap ring groove.
- 5. With the axle in place, tighten down the four nuts, which were installed on the outer bearing flange assembly. These should be tightened down to 30 ft-lbs.

CAUTION:

Failure to tighten down hardware will result in vehicle damage.

- 6. Slide the axle in all of the way until the bearing shims are seated tightly against the inner bearing.
- Double check the alignment by measuring from the outer chassis rail to the sprocket (see Figure IA). This should be the same as the measurement for the sprocket that was written down in step 1. Add or remove thick or thin shims in order to gain proper alignment.

CAUTION: Failure to align the chains will result in vehicle damage.

8. Secure the axle to the bearing using the axle end bolt and flat washer as shown in Figure V. Be sure to put #271 Loctite® on the bolt and tighten it down to 30 ft-lbs. Tighten down the two inner bearing set screws. Proceed to tighten down the outer bearing locking collar. Turn the collar by hand in the same direction that the axle rotates when the vehicle is moving forward. Rotate the collar while applying pressure in towards the bearing until the collar is snug on the bearing. Lock the collar down using a drift pin and hammer. To lock it, place the drift pin into the collar locking hole (not the set screw hole) and tap the collar with 4 or 5 firm taps to rotating it and tighten it. Tighten down the set screw with a hex wrench.

9. Grease the outer and inner bearings with one or two pumps of grease with a grease gun. Grease the sprocket assembly with 3 or 4 pumps of grease with a grease gun.

🛕 CAUTION:

Too much grease in a bearing will damage the bearing seals.

- 10. Now double check the alignment of the front idler sprocket (adjuster sprocket). Measure from the outer chassis rail to the center (of the width) of the axle sprocket. With the idler sprocket bolt snug, measure from the outer chassis rail to the center of the center idler sprocket (see Figure IB). Move the shims for the idler sprocket around until you have the same measurement as the outer chassis rail to the center of the axle sprocket.
- 11. Reinstall the chain. Adjust the chain as described in your Operators Manual. Be sure to tighten down all the hardware that was loosened.

A CAUTION:

Failure to properly adjust chains will result in vehicle damage.

12. Slide (drop) the brake caliper assembly onto the brake disk. Place the bolt into the correct locations along with the washers/shims removed in step 4 of the removal process. Tighten the bolts down until just snug. There should be a small gap between both sides of the caliper mounting bracket and the inner brake pad and caliper arm plate. This will ensure that pads are not tight against the brake rotor. Tighten down the brake caliper mounting bracket hardware.

WARNING Failure to tighten hardware can result in loss of control of vehicle.

- 12. Reinstall the tire on the axle. Tighten down the lug nuts to 55 ftlbs.
- 13. Reconnect the negative battery cable and install the floorboards and engine cover.

The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

CAUTION: A CAUTION indicates special precautions that must be taken to avoid damage to the vehicle.

Failure to follow WARNING instructions <u>could result in severe injury</u> or <u>death</u> to the vehicle operator, any passenger, or a bystander.







Max IV Center Axle Replacement For models after Serial Number 19417 and all Snap-Ring style axle replacements.

03/16/06

Max IV Snap Ring Center Axle replacement.doc

Tools required:

9/16" Wrench	6" Extension	
3/4" Wrench	Ratchet	Hammer
3/4" Socket	Drift Pin	9/16" Socket
Hex Wrench Set	Grease Gun	Tape Measure
Torque Wrench	Floor Jack	Jack Stands
Standard Screwdriver	Permatex [®] Anti-Seize	
Rubber Mallet	#271 Loctite [®] Thread locker	
Heavy Duty Snap Ring Pliers	(Recreatives P/N 45011 with	tips P/N 45012)

Procedure

Read through all instructions before you begin.

- **1.** Move the vehicle to a level surface.
- 2. Place the vehicle in reverse gear.
- **3.** Remove the floorboards and engine cover. Disconnect the negative battery cable.
- 4. Raise the vehicle so the tires are off the ground.

A WARNING

$^{m U}$ Securely support the vehicle so there is no danger of it falling.

- 5. Place the vehicle in NEUTRAL gear.
- 6. Remove the tire from the axle to be replaced.

Center Axle Replacement

Removal

1. Measure the distance from the outer chassis rail to the edge of the outer center sprocket. Write this measurement down as it will be needed later in order to realign the chain(s). (See Figure IA).



Failure to align the chains will result in vehicle damage.

- 2. Loosen the front and center chain adjuster assemblies for the front and center chains.
- **3.** Remove the front chain (122 link) and the center chain (116 ink) from the center sprocket assembly.
- **4.** Locate the axle end bolt. Using a 9/16" wrench or socket, remove the bolt, lock washer, and flat washer from the end of the axle. Loosen the two set screws on the inner bearing (see Figure V).
- 5. Locate the four, 3/8" nuts and lock washers on the outside of the body, which secure the outer bearing flange to the chassis.Remove these nuts and lock washers. Slide the axle out until the sprocket is in contact with the frame.
- 6. Locate the inner sprocket assembly snap ring (next to the inner most edge of the sprocket assembly). Using the <u>proper</u> snap ring pliers, loosen the snap ring and begin to walk it towards the end of the axle. As the inner snap ring is walked off the axle end, remove the bearing shims (thick and/or thin) on the end of the axle and set them aside. Keep track of these shims and the order in which they are on the axle. This will help in proper alignment during the assembly process.

🔥 WARNING

Failure to use the proper snap ring pliers can result in serious injury.

7. Remove the axle from the vehicle. The outer bearing, flange, locking collar, outer sprocket snap ring, and any sprocket shims should remain on the axle. Keep track of the sprocket shim(s) and their order on the axle. You may need to tap the axle out with a hammer by tapping on the back side of the wheel flange (the plate the wheel bolts to). The sprocket assembly will remain in the vehicle.

Note: Over time, there is a possibility of the axle becoming rusted to the inner bearing or sprocket assembly. In this case, the axle must be cut with a grinding wheel. After the axle is cut and removed, remove the bearing or sprocket assembly from the chassis (see the *Bearing Replacement* section or *Sprocket Replacement* Section of the service manual) and replace it with a new bearing or sprocket assembly if necessary.

Always wear safety glasses when cutting metal objects.

8. Once the axle is removed, place it on a table or bench and in a vise if possible. Remove the sprocket shim(s) and the outer sprocket snap ring using the proper snap ring pliers. Keep track of sprocket shim(s) as it will be used later during the installation. Loosen the set screw on the locking collar on the outer bearing. Unlock the locking collar using a hammer and a drift pin. To unlock the collar, place the drift pin in the locking hole (not the set screw hole) and tap it with the hammer so that the collar will spin in the same direction that the axle rotates when the vehicle is moving backwards. Once loose, slide the locking collar away from the bearing. Remove the bearing, flange, and locking collar from the axle.

Installation

- 1. Refer to the *Center Sprocket Snap-Ring Style Replacement Instructions* for sprocket inspection and sprocket shimming before proceeding to the next step.
- 2. Inspect the paper flange gasket located between the outer steel bearing flanges. Replace if necessary. Reinstall the outer chassis bearing and flange, which was removed with the axle assembly, to the chassis. Be sure that the eccentric locking surface on the bearing is facing towards the outside of the vehicle and that the grease fitting on the outer flange is towards the top of the vehicle. Loosely install the lock washers and nuts onto the four, 3/8" bolts. These will be tightened down later.
- **3.** Place the outer locking collar on the axle (the one from the outer chassis bearing). Make sure that the recessed portion on the locking collar is facing the vehicle body. Coat the axle shaft with Anti-Seize.
- **4.** Insert the axle into the outer chassis bearing. Install the outer sprocket snap ring and sprocket shim(s) onto the end of the axle. Do not place the snap ring into the outer groove yet. Slide the axle

through the sprocket assembly. Carefully slide the snap ring, appropriate sprocket shim(s), and sprocket assembly along the axle shaft until the snap ring locks securely into the outer snap ring groove. Slide on the inner snap ring only part way. Place the inner bearing shims, removed in step 7 of the removal procedure, on the turned down portion of the axle (see Figure V). Slide the axle into the inner bearing. Proceed to slide the inner snap ring along the axle shaft until it locks into the inner snap ring groove.

5. With the axle in place, tighten down the four nuts, which were installed on the outer bearing flange assembly. These should be tightened down to 30 ft-lbs.

CAUTION:

Failure to tighten down hardware will result in vehicle damage.

- 6. Slide the axle in all of the way until the bearing shims are seated tightly against the inner bearing.
- 7. Double check the alignment by measuring from the outer chassis rail to the sprocket (see Figure IA). This should be the same as the measurement for the sprocket that was written down in step 1. Add or remove thick or thin shims in order to gain proper alignment.

CAUTION: Failure to align the chains will result in vehicle damage.

- 8. Secure the axle to the bearing using the axle end bolt and flat washer as shown in Figure V. Be sure to put #271 Loctite® on the bolt and tighten it down to 30 ft-lbs. Tighten down the two inner bearing set screws. Proceed to tighten down the outer bearing locking collar. Turn the collar by hand in the same direction that the axle rotates when the vehicle is moving forward. Rotate the collar while applying pressure in towards the bearing until the collar is snug on the bearing. Lock the collar down using a drift pin and hammer. To lock it, place the drift pin into the collar locking hole (not the set screw hole) and tap the collar with 4 or 5 firm taps to rotating it and tighten it. Tighten down the set screw with a hex wrench.
- **9.** Grease the outer and inner bearings with one or two pumps of grease with a grease gun. Grease the sprocket assembly with 3 or 4 pumps of grease with a grease gun.



Too much grease in a bearing will damage the bearing seals.

- 10. Now double-check the alignment of the front and center idler sprockets (adjuster sprockets). Measure from the outer chassis rail to the center (of the width) of the appropriate axle sprocket. With the idler sprocket bolt snug, measure from the outer chassis rail to the center of the idler sprocket (see Figure IB). Move the shims for the idler sprocket around until you have the same measurement as the outer chassis rail to the center of the axle sprocket.
- Reinstall the chain. Adjust the chain as described in your 11. Operators Manual. Be sure to tighten down all the hardware that was loosened.

CAUTION:

Failure to properly adjust chains will result in vehicle damage.

- 12. Reinstall the tire on the axle. Tighten down the lug nuts to 55 ftlbs.
- 13. Reconnect the negative battery cable and install the floorboards and engine cover.

The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

CAUTION:

A CAUTION indicates special precautions that must be taken to avoid damage to the vehicle.

WARNING Failure to follow WARNING instructions could result in severe injury or death to the vehicle operator, any passenger, or a bystander.





Max IV Rear Axle Replacement For models after Serial Number 19089 and all rear splined axle replacements.

10/8/03

Max IV Snap Ring Rear Axle replacement.doc

Tools required:

9/16" Wrench	6" Extension	Steel Straight Edge
3/4" Wrench	Ratchet	Hammer
3/4" Socket	Drift Pin	9/16" Socket
Hex Wrench Set	Grease Gun	Tape Measure
Torque Wrench	Floor Jack	Jack Stands
Standard Screwdriver	Permatex [®] Anti-Seize	
Rubber Mallet	#271 Loctite [®] Thread locker	
Heavy Duty Snap Ring Pliers	(Recreatives P/N 45011 with	tips P/N 45012)

Procedure

Read through all instructions before you begin.

- **1.** Move the vehicle to a level surface.
- 2. Place the vehicle in reverse gear.
- **3.** Remove the floorboards and engine cover. Disconnect the negative battery cable.
- 4. Raise the vehicle so the tires are off the ground.

A WARNING

$^{m U}$ Securely support the vehicle so there is no danger of it falling.

- 5. Place the vehicle in NEUTRAL gear.
- 6. Remove the tire from the axle to be replaced.

Rear Axle Replacement

Removal

1. Measure the distance from the outer chassis rail to the edge of the outer rear sprocket. Write this measurement down as it will be needed later in order to realign the chain(s). (See Figure IA).



- 2. Loosen the rear chain adjuster assembly for the axle to be replaced. Loosen the jam nut on the rear adjuster bolt (protruding through the angle at the rear of the chassis) and then remove the adjuster nut. Tap or slide the adjuster bolt towards the front of the vehicle through the hole in the rear of the chassis. Then rotate the adjuster assembly up and out of the way.
- **3.** Remove the rear chain (52 link) from the transmission and rear sprocket. Remove the center chain (116 link) from the rear sprocket and center sprocket. Remove the bolt from the end of the axle to be removed/replaced. Loosen the two set screws on the inner bearing (see Figure V).
- 4. Locate the four, 3/8" nuts and lock washers, which secure the outer bearing flange to the chassis. Remove these nuts and lock washers. Slide the axle out until the sprocket is in contact with the frame. Remove the bearing shims (thick and/or thin) on the end of the axle and set them aside. Keep track of these shims and the order in which they are on the axle. This will help in proper alignment during the assembly process.
- 5. Locate the inner sprocket snap ring (next to the inner most edge of the sprocket assembly). Using the <u>proper</u> snap ring pliers, loosen the snap ring and remove it from the axle.



Failure to use the proper snap ring pliers can result in serious injury.

6. Remove the axle from the vehicle. The outer bearing, flange, locking collar, outer sprocket snap ring, and any sprocket shims should remain on the axle. Keep track of the sprocket shim(s) and their order on the axle. You may need to tap the axle out with a hammer by tapping on the back side of the wheel flange (the plate the wheel bolts to). The sprocket assembly will remain in the vehicle.

Note: Over time, there is a possibility of the axle becoming rusted to the inner bearing or sprocket assembly. In this case, the axle must be cut with a grinding wheel. After the axle is cut and removed, remove the bearing or sprocket assembly from the chassis (see the *Bearing Replacement* section or *Sprocket Replacement* Section of the service manual) and replace it with a new bearing or sprocket assembly if necessary.

Always wear safety glasses when cutting metal objects.

7. Once the axle is removed, place it on a table or bench and in a vise if possible. Remove the sprocket shim(s) and the outer sprocket snap ring using the proper snap ring pliers. Keep track of sprocket shim(s) as it will be used later during the installation. Loosen the set screw on the locking collar on the outer bearing. Unlock the locking collar using a hammer and a drift pin. To unlock the collar, place the drift pin in the locking hole (not the set screw hole) and tap it with the hammer so that the collar will spin in the same direction that the axle rotates when the vehicle is moving backwards. Once loose, slide the locking collar away from the bearing. Remove the bearing, flange, and locking collar from the axle.

Installation

- 1. Inspect the paper flange gasket located between the outer steel bearing flanges. Replace if necessary. Reinstall the outer chassis bearing and flange, which was removed with the axle assembly, to the chassis. Be sure that the eccentric locking surface on the bearing is facing towards the outside of the vehicle and that the grease fitting on the outer flange is towards the top of the vehicle. Loosely install the lock washers and nuts onto the four, 3/8" bolts. These will be tightened down later.
- 2. Place the outer locking collar on the axle (the one from the outer chassis bearing). Make sure that the recessed portion on the locking collar is facing the vehicle body. Coat the axle shaft with Anti-Seize.
- **3.** Insert the axle into the outer chassis bearing. Install the outer sprocket snap ring and sprocket shim(s) onto the end of the axle. Do not place the snap ring into the outer groove yet. Slide the axle through the sprocket assembly. Carefully slide the snap ring, appropriate sprocket shim(s), and sprocket assembly along the axle

shaft until the snap ring locks securely into the outer snap ring groove. With the sprocket shim(s) and sprocket assembly seated against the outer snap ring, install the inner snap ring, being sure that it locks securely into the inner snap ring groove. Place the shims removed in step 5 of the removal procedure (always use new thin shims) on the turned down portion of the axle (see Figure V). Slide the axle into the inner bearing.

4. With the axle in place, tighten down the four nuts, which were installed on the outer bearing flange assembly. These should be tightened down to 30 ft-lbs.

CAUTION: Failure to tighten down hardware will result in vehicle damage.

- 5. Slide the axle in all of the way until the bearing shims are seated tightly against the inner bearing.
- 6. Double check the alignment by measuring from the outer chassis rail to the inner center sprocket (see Figure IA). This should be the same as the measurement for the outer rear sprocket that was written down in step 1. Also, double check the alignment of the 34 tooth (large) rear sprocket to the transmission sprocket. Lay a steel straight edge along the outside of the transmission sprocket and the outside edge of the large (34 tooth) rear sprocket (see Figure III). Add or remove thick or thin shims in order to gain proper alignment. Repeat this process with the straight edge on the inside edge of both sprockets (see Figure II).
 - **Note:** If there is a gap on one side of the 34-tooth sprocket while the other side is flush with the straight edge, move the axle so there is a smaller gap on between both sides of the 34tooth sprocket and the straight edge. Sprocket thickness may vary due to machining tolerances.

CAUTION: Failure to align the chains will result in vehicle damage.

7. Once the alignment of the 34-tooth rear sprocket and the transmission sprocket has been verified, measure from the outer chassis rail to the outer rear sprocket (see Figure 1A). If this is the same as the measurement written down in step 1 of the removal procedure, proceed to step 9. If not, use this new measurement and the same number of shims to align the center axle inner sprocket with the rear axle outer sprocket and then align the center axle outer sprocket with the front axle sprocket. Refer to the center and

front axle replacement sections in order to properly align these axles.

- 8. Secure the axle to the bearing using the bolt, lock washer, and flat washer as shown in Figure VI. Be sure to put #271 Loctite® on the bolt and tighten it down to 30 ft-lbs. Tighten down the two inner bearing set screws. Proceed to tighten down the outer bearing locking collar. Turn the collar by hand in the same direction that the axle rotates when the vehicle is moving forward. Rotate the collar while applying pressure in towards the bearing until the collar is snug on the bearing. Lock the collar down using a drift pin and hammer. To lock it, place the drift pin into the collar locking hole (not the set screw hole) and tap the collar with 4 or 5 firm taps to rotating it and tighten it. Tighten down the set screw with a hex wrench.
- **9.** Grease the outer and inner bearings with one or two pumps of grease with a grease gun. Grease the sprocket assembly with 3 or 4 pumps of grease with a grease gun.

A CAUTION: Too m

Too much grease in a bearing will damage the bearing seals.

- **10.** Reinstall the rear chain adjuster assembly to the rear of the chassis.
- 11. Now double check the alignment of the center (between the center rear axles) and rear idler (on the short/primary chain) and sprockets (adjuster sprocket). Measure from the outer chassis rail to the center (of the width) of the outer rear axle sprocket. With the idler sprocket bolt snug, measure from the outer chassis rail to the center of the center idler sprocket (see Figure IB). Move the shims for the idler sprocket around until you have the same measurement as the outer chassis rail to the center of the outer center axle sprocket. Now, snug all the hardware on the rear adjuster assembly. Using a straight edge, align both sides of the rear idler sprocket with the transmission output sprocket (see Figure IV). There should be a small gap (1/32" to 1/16") between the idler sprocket and the straight edge on both sides. Move the idler shims to obtain proper alignment.
- **12.** Reinstall the chains. Adjust the chains as described in your owner's manual. Be sure to tighten down all the hardware that was loosened on the rear idle assembly after adjusting the chains.



Failure to properly adjust chains will result in vehicle damage.

- **13.** Reinstall the tire on the axle. Tighten down the lug nuts to 55 ft-lbs.
- **14.** Reconnect the negative battery cable and install the floorboards and engine cover.

The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

CAUTION: A CAUTION indicates special precautions that must be taken to avoid damage to the vehicle.

Failure to follow WARNING instructions <u>could result in severe injury</u> or <u>death</u> to the vehicle operator, any passenger, or a bystander.











Max IV

Front Sprocket Assembly Replacement For models after Serial Number 19417 and all Snap-Ring style front sprocket replacements.

03/16/06

Max IV Snap Ring Front Sprocket replacement.doc

Follow the *Front Axle Replacement* instructions and remove the front axle and sprocket from the vehicle.

Front Sprocket Replacement

- **1.** Once the axle has been removed, lift the sprocket assembly out of the vehicle.
- 2. Inspect the chain and sprocket for wear. It is common for a loose or worn-out chain to cause sprocket failure. Replace any worn items if necessary. Also, inspect the brake rotor and brake pads.

CAUTION:

Failure to replace worn parts will result in damage to the vehicle.

- **3.** On the bench, install the snap ring into the outer snap ring groove of the axle and slide on the sprocket shim(s), which were removed from the axle. Slide the new sprocket assembly onto the axle so the sprocket hub sits tight against the sprocket shim(s) and outer snap ring. Install the inner snap ring. Using a feeler gauge, determine the amount of gap between the inner snap ring and the sprocket hub. There should be no more than 0.030" and no less than 0.010". Add or remove sprocket shims to obtain the proper gap.
- **4.** Remove the snap rings and sprocket assembly from the axle. Proceed to the installation section of the *Front Sprocket Replacement* instructions.

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CAUTION:

A CAUTION indicates special precautions that must be taken to avoid damage to the vehicle.

WARNING Failure to follow WARNING instructions <u>could result in severe injury</u> or death to the vehicle operator, any passenger, or a bystander.

Max IV

Center Sprocket Assembly Replacement For models after Serial Number 19417 and all Snap-Ring style center sprocket replacements.

03/16/06

Max IV Snap Ring Center Sprocket replacement.doc

Follow the *Center Axle Replacement* instructions and remove the center axle and sprocket from the vehicle.

Center Sprocket Replacement

- **1.** Once the axle has been removed, lift the sprocket assembly out of the vehicle.
- 2. Inspect the chains and sprockets for wear. It is common for a loose or worn-out chain to cause sprocket failure. Replace any worn items if necessary.



Failure to replace worn parts will result in damage to the vehicle.

- **3.** On the bench, install the snap ring into the outer snap ring groove of the axle and slide on the sprocket shim(s), which were removed from the axle. Slide the new sprocket assembly onto the axle so the sprocket hub sits tight against the sprocket shim(s) and outer snap ring. Install the inner snap ring. Using a feeler gauge, determine the amount of gap between the inner snap ring and the sprocket hub. There should be no more than 0.030" and no less than 0.010". Add or remove sprocket shims to obtain the proper gap.
- **4.** Remove the snap rings and sprocket assembly from the axle. Proceed to the installation section of the *Center Sprocket Replacement* instructions.

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CAUTION:

A CAUTION indicates special precautions that must be taken to avoid damage to the vehicle.

WARNING Failure to follow WARNING instructions <u>could result in severe injury</u> or death to the vehicle operator, any passenger, or a bystander.

Max IV Rear Sprocket Replacement For models after Serial Number 19089 and all rear splined sprocket replacements.

10/10/03

Max IV Snap Ring Rear Sprocket replacement.doc

Follow the *Axle Replacement* instructions and remove the rear axle and sprocket from the vehicle.

Rear Sprocket Replacement

- **1.** Once the axle has been removed, lift the sprocket assembly out of the vehicle.
- 2. Inspect all the chains for wear. It is common for a loose or wornout chain to cause sprocket failure. Replace any worn items if necessary.

A CAUTION:

Failure to replace worn parts will result in damage to the vehicle.

- **3.** On the bench, install the snap ring into the outer snap ring groove of the axle and slide on the sprocket shim(s), which were removed from the axle. Slide the new sprocket assembly onto the axle so the sprocket hub sits tight against the sprocket shim(s) and outer snap ring. Install the inner snap ring. Using a feeler gauge, determine the amount of gap between the inner snap ring and the sprocket hub. There should be no more than 0.030" and no less than 0.010". Add or remove sprocket shims to obtain the proper gap.
- **4.** Remove the snap rings and sprocket assembly from the axle. Proceed to the installation section of the *Rear Sprocket Replacement* instructions.

The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



CAUTION: A CAUTION indicates special precautions that must be taken to avoid damage to the vehicle.

Failure to follow WARNING instructions <u>could result in severe injury</u> or <u>death</u> to the vehicle operator, any passenger, or a bystander.