STEERING PRODUCTS™

AXLE · PRO · EQUIPMENT

APE

A NEW EVOLUTION IN AXLE ENHANCEMENT

Instruction Manual

STEMCO®

Making the Roadways Safer®

SAFETY INFORMATION

READ ALL SAFETY WARNINGS AND INSTRUCTIONS

The first step in using the Axle Pro Equipment is SAFETY FIRST SAFETY ALWAYS. Please take a moment to make sure these safety precautions are in place. These components are heavy! For your protection wear safety shoes, safety glasses and use proper lifting techniques.

SAFETY PROCEDURES	
	SAFETY GLASSES
	SAFETY SHOES
	CHIPS CAN CUT
	WHEN LIFTING: 1. Bring the load as close as possible before lifting 2. Lift with legs – not back 3. Keep head up, back straight & bend at the hips 4. Keep the load close to the body 5. Look where you're going 6. Shift feet to turn, don't twist your body
	ALWAYS ATTACH SAFETY CHAIN TO SECURE UNIT IN PLACE

WARNING

Failure to follow the instructions when using the Axle Pro Equipment could create a risk of personal injury to the servicing technician and/or component damage, which may jeopardize the safety of the vehicle and that of the operator. Do not install sleeve and/or any other axle parts in an axle that has been improperly drilled or reamed. Components of the Axle Pro Equipment are intended for use with the Axle Pro Equipment only, failure to use for intended purpose and/or in the proper manner may result in injury.

⚠	**IMPORTANT**	For your protection, use Standard Shop Safety Procedures during this process.

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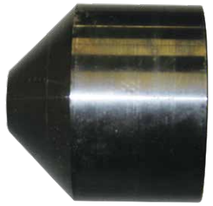
PART LIST/PHOTO GLOSSARY

UPPER PLATE

LOWER PLATE

6 ½" THREADED MOUNTING ROD WITH WELDED NUT



MANDREL

MANDRELS WITH 12" THREADED ROD WITH NUTS

UPPER PLATE WITH FOUR 6 ½" THREADED MOUNTING RODS AND ONE 6 ½" LEVELING THREADED ROD WITH EXTRA NUT

TiN COATED CUTTER

REAMER WITH ARBOR UNASSEMBLED

REAMER MOUNTED TO ARBOR

	IMPORTANT	For your protection, use Standard Shop Safety Procedures during this process.

STEP 1:

REMOVE & INSPECT COMPONENTS – ATTACH MANDRELS

1. Remove all components including kingpins, steering knuckle and associated parts using standard shop procedures and practices. (See Fig. 1A)
2. Clean and inspect axle eye. Using a measuring tool (telescoping gauge and micrometer or STEMCO Kaiser "go no go gauge") measure your axle eye size. Determine correct axle eye size and required cutter. (See Fig. 1B)

   Refer to Axle Pro Equipment Cross-Reference Matrix Sheet. (See Pages 6 and 7 of this book or literature part # 577-3093.)
3. Attach centering mandrels (Tapered Items) to axle bore top and bottom using threaded rod and nuts. (See Fig. 1C)
4. At the batteries, install an arc suppression tool unit in the vehicle to avoid magnetic interference or power surges. (See Fig. 1D)

   Not included in Kit

FIG. 1A

FIG. 1B

FIG. 1C

FIG. 1D

STEP 2:

PRE-DRILL CUTTER AND REAMER SETUP

1. Attach extension fitting and cutter to drill using allen wrenches. Critical step must attach the 2 inch extension. (See Fig. 2A)
2. First time use, reamer must be mounted to arbor. Place reamer over arbor, interlocking reamer taper against arbor taper and aligning notches. (See Fig. 2B)

   Firmly strike small end of arbor against surface to assure proper taper interlock.
3. After assuring proper taper interlock, thread nut and collar towards reamer, finger tight only. If reamer ever needs to be removed use wrench on nut, threading towards reamer. (See Fig. 2C)

FIG. 2A

FIG. 2B

FIG. 2C

	IMPORTANT	For your protection, use Standard Shop Safety Procedures during this process.

AXLE PRO EQUIPMENT CROSS-REFERENCE MATRIX

AXLE CODE	KING PIN KIT #	APE MASTER KIT #	APE CUTTER KIT #	APE REPLACEMENT CUTTER KIT #	APE CUTTER #	APE REAMER #	SLEEVE DRIVER #	APE SLEEVE #
W8002502	K50W	85.056.07	84.056.07	87.056.07	83.056.07	82.056.07	ST70-4T	91.050.23
F-050, F-055	K55G & K56G	85.056.07	84.056.07	87.056.07	83.056.07	82.056.07	ST70-4T	91.056.07
MFS-06	K60R	N/A	84.060.18 ★	N/A	83.060.18	82.060.18	ST70-3T	91.060.18
ISUZU NPR 1990-1998	K68Z	85.056.07	84.056.07	87.056.07	83.056.07	82.056.07	ST70-4T	91.068.26
ISUZU NPR 1998-PRESENT	K69Z	85.056.07	84.056.07	87.056.07	83.056.07	82.056.07	ST70-4T	91.068.26
MFS-08	K80R	N/A	84.080.18 ★	N/A	83.080.18	82.080.18	ST70-28T	92.080.18
FA-101, FA-104	K101I	85.103.19	84.103.19	87.103.19	83.103.19	82.103.19	ST70-2T	91.101.09
02ADA, 02ADB, 02AEM BEFORE 10-1-2002	K102I	85.103.19	84.103.19	87.103.19	83.103.19	82.103.19	ST70-2T	92.102.09
02AEM AFTER 10-1-2002	K103S	85.103.19	84.103.19	87.103.19	83.103.19	82.103.19	ST70-2T	93.103.19
EFA12F4	K120E	85.120.05	84.120.05	87.120.05	83.120.05	82.120.05	ST70-6T	91.120.05
AF-10.0-3, AF-12.0-3, AF-13.0-3, AF-13.3-3, AF-14.7-3	K120A	85.122.05	84.122.05	87.122.05	83.122.05	82.122.05	ST70-7T	92.120.01
02-ADC, 02-ADD, I-100S, I-120S, I-120SG	K120I	85.147.05	84.147.05	87.147.05	83.147.05	82.147.05	ST70-19T	92.120.09
E1000, E1200, E1201, E1320	K122E	85.122.05	84.122.05	87.122.05	83.122.05	82.122.05	ST70-7T	91.122.05
02-AGA, E1203I	K123E	85.122.05	84.122.05	87.122.05	83.122.05	82.122.05	ST70-7T	93.123.05
F3W-1300, F3W-1400 WITH BOLT ON CAPS	K126W	85.122.05	84.122.05	87.122.05	83.122.05	82.122.05	ST70-33T	91.127.23
F3W-1300, F3W-1400 WITH SCREW IN CAP	K127W	85.122.05	84.122.05	87.122.05	83.122.05	82.122.05	ST70-33T	91.127.23
WATSON CHALIN 1100 SERIES WITH WESTPORT AXLE	K130W	85.122.05	84.122.05	87.122.05	83.122.05	82.122.05	ST70-7T	91.961.12
DUARALIFT & MODEL 9000	K132K	85.122.05	84.122.05	87.122.05	83.122.05	82.122.05	ST70-7T	91.132.11
FA-118, FA-127, FA-139, FA-329, FA-337, FA-339, FA-342, FA-343, I-108, I-120, I-132, I-132S ALL ABOVE APPLICATIONS 1982 AND NEWER	K140I	85.120.05	84.120.05	87.120.05	83.120.05	82.120.05	ST70-5T	92.140.09
E1460	K146E	85.147.05	84.147.05	87.147.05	83.147.05	82.147.05	ST70-23T	91.146.05

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AXLE PRO EQUIPMENT CROSS-REFERENCE MATRIX

AXLE CODE	KING PIN KIT #	APE MASTER KIT #	APE CUTTER KIT #	APE REPLACEMENT CUTTER KIT #	APE CUTTER #	APE REAMER #	SLEEVE DRIVER #	APE SLEEVE #
E1002, E1202, E1322, E1462	K147E	85.147.05	84.147.05	87.147.05	83.147.05	82.147.05	ST70-23T	93.147.05
KIMBLE	K149E	85.147.05	84.147.05	87.147.05	83.147.05	82.147.05	ST70-23T	93.147.05
KGS150	K150KG	85.931.12	84.931.12	87.931.12	83.931.12	82.931.12	ST70-12T	91.150.07
02-ADH, 02-AEU, 02-AEV, 02-AEW, 02-ADJ, 02-ADK, I-160S, I-160W, I-180S, I-180W, I-200S, I-220S, I-220W	K160S	85.931.12	84.931.12	87.931.12	83.931.12	82.931.12	ST70-12T	92.160.19
EFA18F3, EFA18F4, EFA20F4, EFA22T2	K180E	85.147.05	84.147.05	87.147.05	83.147.05	82.147.05	ST70-23T	91.180.05
MFS-16122A, MFS-16143A, MFS-18133A	K180R	85.931.12	84.931.12	87.931.12	83.931.12	82.931.12	ST70-12T	92.180.18
MFS16133A, MFS18133A, MFS20133A	K181R	85.931.12	84.931.12	87.931.12	83.931.12	82.931.12	ST70-12T	92.931.12
D2000F, D2200F	K201S	85.931.12	84.931.12	87.931.12	83.931.12	82.931.12	ST70-12T	93.201.19
KGS230	K230KG	85.700.20	84.700.20 ★	87.700.20	83.700.20	82.700.20	ST70-29T	94.230.07
700214	K700T	85.700.20	84.700.20 ★	87.700.20	83.700.20	82.700.20	ST70-29T	92.700.20
FF-921, FF-923	K921L	85.122.05	84.122.05	87.122.05	83.122.05	82.122.05	ST70-7T	92.961.12
FF-931	K931L	85.122.05	84.122.05	87.122.05	83.122.05	82.122.05	ST70-7T	92.961.12
	K941F	85.122.05	84.122.05	87.122.05	83.122.05	82.122.05	ST70-7T	92.942.06
	K942F	85.122.05	84.122.05	87.122.05	83.122.05	82.122.05	ST70-7T	92.942.06
WATSON CHALIN 1100 SERIES WITH MERITOR AXLE	K961L	85.122.05	84.122.05	87.122.05	83.122.05	82.122.05	ST70-7T	91.961.12
FF-961	K961L	85.122.05	84.122.05	87.122.05	83.122.05	82.122.05	ST70-7T	92.961.12
FF-981	K981R	85.122.05	84.122.05	87.122.05	83.122.05	82.122.05	ST70-7T	92.961.12
RIDEWELL KIT NO. 1660106	KG931R	85.122.05	84.122.05	87.122.05	83.122.05	82.122.05	ST70-7T	91.931.18
FG-931, FG-941, FG-943, 17100, 17101, MFS13-143A, MFS13-144A, MFS14-143A	KG931R	85.122.05	84.122.05	87.122.05	83.122.05	82.122.05	ST70-7T	92.931.18
FL-931, FL-941	KH931L	85.931.12	84.931.12	87.931.12	83.931.12	82.931.12	ST70-12T	92.931.12
FH-941, FH-945, FH-946	KH946R	85.122.05	84.122.05	87.122.05	83.122.05	82.122.05	ST70-7T	92.946.18

★ This cutter kit is not included in 85.999.99 or 95.999.99

For tighter fitting bushings, consider ordering any of the APE kits, or sleeves in the tight fit configuration by adding a letter 'T' to the end of the part number. Carbide Reamers are available for extreme applications.

IMPORTANT For your protection, use Standard Shop Safety Procedures during this process.

STEP 3:

AXLE ALIGNMENT ASSEMBLY

1. Install four threaded rods with welded nuts against upper plate.
   (Upper plate has no cut-out.) Do Not Tighten.
2. Install adjusting threaded rod with welded nut against upper plate plus one additional nut. Do Not Tighten (See Fig. 3A)
3. Place upper plate over upper centering mandrel with threaded rods pointing down. (See Fig. 3B)
4. Pull bottom plate up carefully aligning threaded rods through appropriate holes. Pull plate up until it is over lower centering mandrel and flush against bottom of axle. (See Fig. 3C)
5. While holding lower plate in place, place nuts onto five exposed threaded rods far enough to insure plate will not fall.
6. Tighten welded nuts into bottom side of upper plate; tighten four nuts against lower plate. Nuts against lower plate should be tightened with torque wrench 36 ft/lbs. Do not tighten nut on rear adjusting rod. (See Fig. 3D)
7. Ensure plates are mounted squarely onto axle. Visually check for gap between plates and axle. (See Fig. 3E)
8. Ensure mounting plates are securely attached. Inspect this by grasping upper plate and attempt to move side to side. Plates must be secure. (See Fig. 3F) If loose, then tighten nuts again & re-check.
9. Remove one of the nuts holding centering mandrel together and remove mandrels. (See Fig. 3G)

FIG. 3A

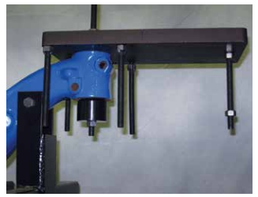


FIG. 3B

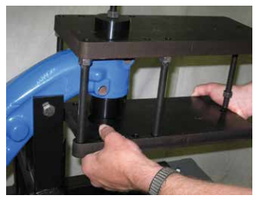


FIG. 3C

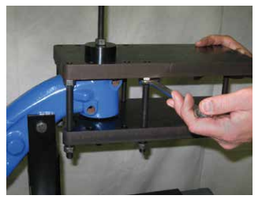


FIG. 3D

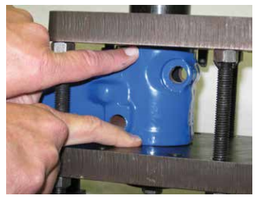


FIG. 3E

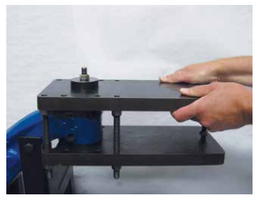


FIG. 3F

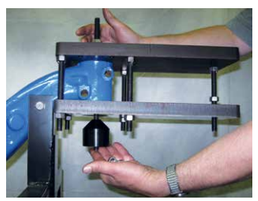


FIG. 3G

⚠	**IMPORTANT**	For your protection, use Standard Shop Safety Procedures during this process.

STEP 4:

LEVELING BAR & DRILL SPEED SETUP

1. Place narrow edge of leveling bar against upper plate (See Fig. 4A)
2. Using leveling bar to test upper plate for flatness. Look for light under the bar or the bar rocking end to end. Adjust if needed with either the nut below lower plate or the nut above lower plate on the adjusting rod. (See Fig. 4B)

   It is crucial to drilling accuracy that plate be properly adjusted.
3. Set proper drill speed: All holes are to be cut at 110 RPM. (See Fig. 4C)
4. Find switches and put in proper position to ensure accurate drilling. (See Fig. 4D)

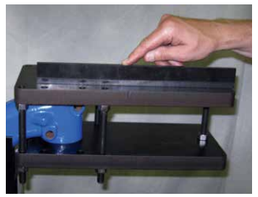


FIG. 4A

FIG. 4B

FIG. 4C

FIG. 4D

STEP 5:

ALIGNMENT BUSHING & DRILL PLACEMENT

1. Place alignment bushing in upper plate hole. (See Fig. 5A)
2. Plug magnetic base drill into proper outlet. Using proper lifting techniques place magnetic based drill onto upper plate. **Do Not Engage Magnet.** Caution must be taken as the unit is not secure at this time. (See Fig. 5B)
3. Align cutter into alignment bushing. (See Fig. 5C)

FIG. 5A

FIG. 5C

FIG. 5B

⚠	**IMPORTANT**	For your protection, use Standard Shop Safety Procedures during this process.

STEP 6:

ENGAGE MAGNET & ASSEMBLE COOLANT SYSTEM

1. Engage drill magnet. (See Fig. 6A)
2. Remove alignment bushing prior to cutting axle. (See Fig. 6B)
3. Assemble the coolant system: Put pump into the bucket. Add 3 pints of coolant and 3 gallons of water and mix thoroughly. (See Fig. 6C) System comes with 3 pints of concentrated coolant. Dilute 3 pints of concentrate with 3 gallons of water.
4. Thread coolant hose through notch in bucket. Attach screen. Place magnetic base manifold on upper plate and align nozzles over axle eye. (See Fig. 6D). Be sure to leave enough room for cutter clearance to allow coolant to flow without damage to the nozzles.

FIG. 6A

FIG. 6B

FIG. 6C

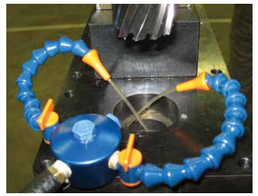


FIG. 6D

STEP 7:

DRILLING PROCEDURE

1. Turn coolant on and ensure steady flow into axle throughout drilling process. (See Fig. 7A)
2. Start drill motor, carefully lower cutter into upper plate and slowly begin cutting process. Slow/steady cutting motion is important. (See Fig. 7B)
3. After one third of the axle is cut raise the cutter out of the axle and shut off drill motor. Use air nozzle or brush to remove shavings on cutter & axle. (See Fig. 7C)
4. Continue with cut until an additional one third of bore (2/3 total) has been drilled. Repeat cleaning process in previous step.
5. Again continue cut until cutter passes completely through the axle eye. Raise cutter, shut off drill motor. Total cut time minus cleanout time should be 5 to 7 minutes. Too fast or too slow could create cutter damage and poor results.

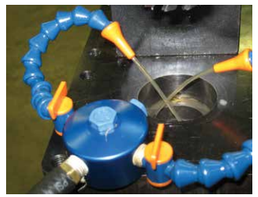


FIG. 7A

FIG. 7B

FIG. 7C

⚠	**IMPORTANT**	For your protection, use Standard Shop Safety Procedures during this process.

STEP 8:

SECOND PASS REAMING PROCESS

DO NOT DISENGAGE MAGNET!!

1. Remove cutter from drill motor. (See Fig. 8A)
2. Install mounted reamer into drill motor using Allen wrenches. (See Fig. 8B)
3. Turn coolant on to ensure steady flow into axle throughout reaming process. (See Fig. 8C)
4. Begin reaming process being careful to start slowly. Continue reaming with slow constant feed & do not stop and clean reamer. (Reaming process should take 5 to 7 minutes, too fast or too slow can damage reamer and negatively affect accuracy).
5. After reaming is complete, raise reamer; turn off drill, coolant & magnet. Remove drill from upper plate.

FIG. 8A

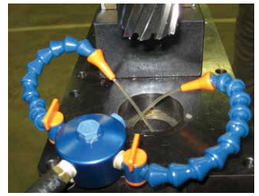


FIG. 8C

FIG. 8B

STEP 9:

SLEEVE INSTALLATION

1. Begin sleeve installation by placing lead into top of axle bore visually aligning lock pin cutouts. (See Fig. 9A)
2. Using a STEMCO Kaiser bushing driver and brass hammer drive axle sleeve into position until flush. (See Fig. 9B)

   Refer to Axle Pro Equipment Cross-Reference Matrix Sheet. (See Pages 6 and 7 of this book or literature part # 577-3093.)
3. The axle eye is enhanced; proceed with the installation of your STEMCO Kaiser king pin kit.

FIG. 9A

FIG. 9B

FIG. 9C

⚠	**IMPORTANT**	For your protection, use Standard Shop Safety Procedures during this process.

AXLE · PRO · EQUIPMENT
APE

A NEW EVOLUTION IN AXLE ENHANCEMENT

EVERYTHING YOU NEED FOR AXLE EYE REPAIR

Only the STEMCO Kaiser Axle Pro Equipment gives you everything you need to enhance worn axle eyes. This revolutionary piece of equipment comes with mounting brackets, a magnetic based drill, coolant, and safety equipment. If you're looking for an affordable, simple and quick way to enhance worn axle eyes choose the STEMCO Kaiser APE.

BENEFITS OF THE STEMCO KAISER APE

- Contains everything you need to enhance worn axle eyes
- Pre-sized, pre-cut hardened sleeves for each axle
- Able to resize the axle eye in just minutes
- Realize a quick return on investment
- New bushing design fixes out of round axle—achieving maximum axle eye life
- Included convenient travel case
- And much more

QWIKKIT®

STEMCO KAISER QWIKKIT® THE "TRUE" NO-REAM KING PIN KIT

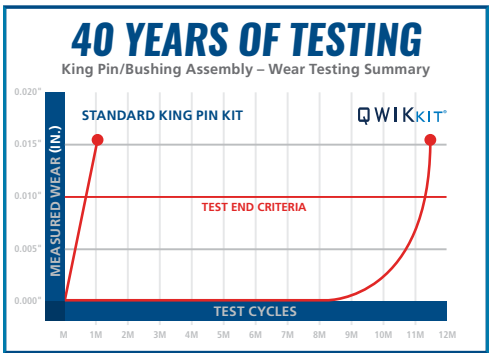
Only the STEMCO Kaiser QwikKit® gives you the performance of steel on steel. In fact, our proprietary High-Chrome, High-Carbon tool steel is the only material that can withstand the constant turning and pounding placed on a steering knuckle and axle over the life of the vehicle.

STEMCO Kaiser NO-REAM Spiral Steel Bushings and Pins are grease grooved for better and more constant lubrication. The Spiral Steel Bushing can be hand-twisted for easy installation and the grooved pin and bushing design allow grease to penetrate the high wear areas without jacking up the front end.

The STEMCO Kaiser QwikKit is easy to install, easy to maintain, and gives you three to four times the life of conventional bronze or nylon kits.

FOR LONGER LIFE AND LESS MAINTENANCE

- 300% more grease
- Grooved pin allows grease to lubricate bearing
- Drive past your next 3 king pin jobs
- Install in half the time with half the effort
- No ream installation



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