

STEMCO KAISER™

an EnPro Industries company



AXLE · PRO · EQUIPMENT



APE

Step By Step
Instruction & Information Guide

Axle Pro Equipment Instruction Guide

Axle Pro Equipment Safety Procedure



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 Glasses



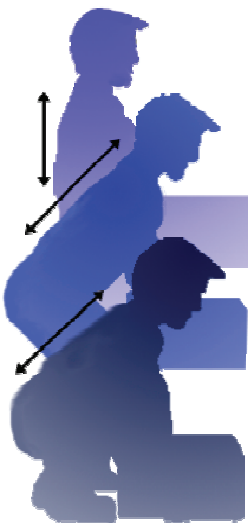
Safety Shoes



Chips can cut



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



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

Axle Pro Equipment Instruction Guide

TABLE OF CONTENTS

Part list / Photo Glossary--	Pages 6-7
Step 1: Remove, Inspect Components & Attach Mandrels--	Page 8
Step 2: Pre-Drill Cutter & Reamer Setup--	Page 9
Step 3: Axle Alignment Assembly--	Pages 10-11
Step 4: Leveling Bar & Drill Speed Setup--	Page 12
Step 5: Alignment Bushing & Drill Placement--	Page 13
Step 6: Engage Magnet & Assemble Coolant System--	Page 14
Step 7: Drilling Procedure--	Page 15
Step 8: Second Pass Reaming Process--	Page 16
Step 9: Sleeve Installation--	Page 17
Part listing--	Page 18
Kit break downs--	Page 19
Cross-Reference--	Pages 20-21
Bore sizes--	Page 23

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 for intended use with the Axle Pro Equipment only, failure to use for intended purpose and/or in the proper manner may result in injury.

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

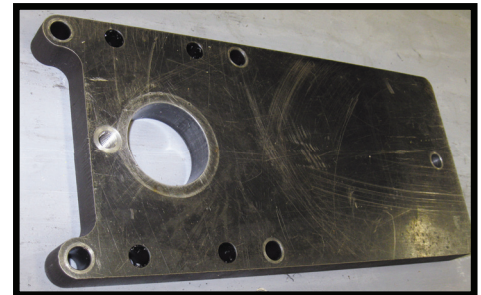
Axle Pro Equipment Instruction Guide

Part list / Photo Glossary

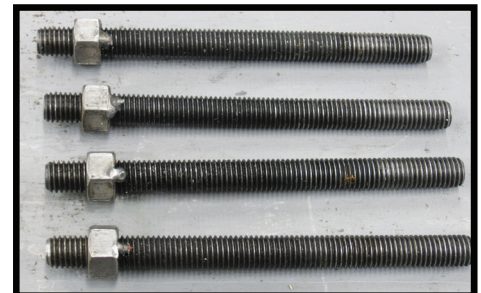
1. Upper plate



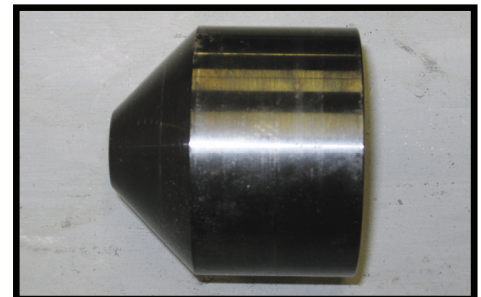
2. Lower plate



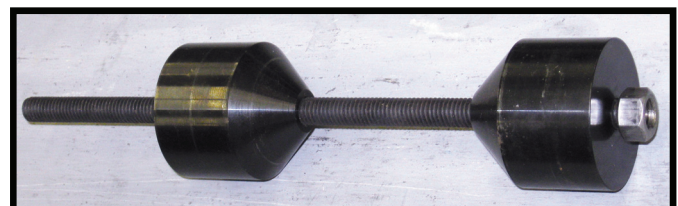
3. 6 ½" threaded mounting rod with welded nut



4. Mandrel



5. Mandrels with 12" threaded rod with nuts

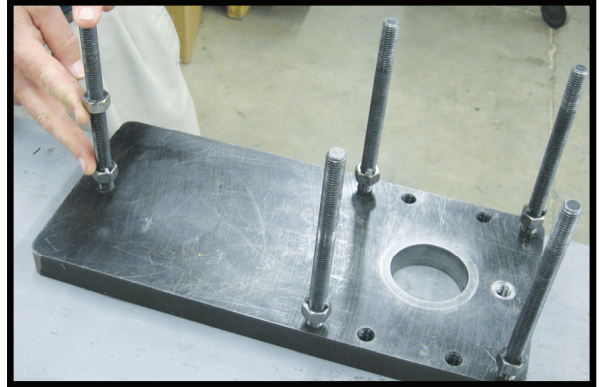


For your protection, use Standard Shop Safety Procedures during this process

Axle Pro Equipment Instruction Guide

Part list / Photo Glossary Cont...

6. Upper plate with four 6 ½" threaded mounting rods and one 6 ½" leveling threaded rod with extra nut



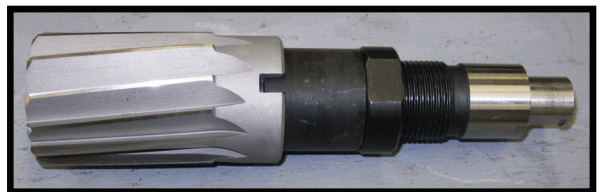
7. TiN coated cutter



8. Reamer with arbor unassembled



9. Reamer mounted to arbor



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

Axle Pro Equipment Instruction Guide

Step 1: Remove & Inspect Components - Attach Mandrels

- a. Remove all components including kingpins, steering knuckle and associated parts using standard shop procedures and practices. (See Photo 1A)



Photo 1A

- b. 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 Photo 1B)
Refer to Axle Pro Equipment Cross-Reference Matrix Sheet (page 19 of this book or literature part # 01 577 0093).



Photo 1B

- c. Attach centering mandrels (Tapered Items) to axle bore top and bottom using threaded rod and nuts. (See Photo 1C)

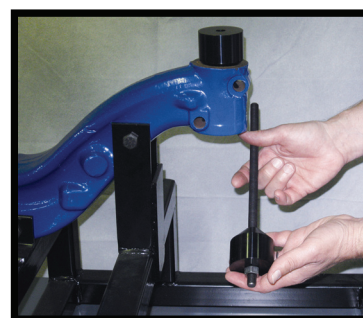


Photo 1C

- d. At the batteries, install an arc suppression tool unit in the vehicle to avoid magnetic interference or power surges. (See Photo 1D) **(Not included in Kit)**



Photo 1D

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

Axle Pro Equipment Instruction Guide

Step 2: Pre-Drill Cutter and Reamer Setup

- a. Attach extension fitting and cutter to drill using allen wrenches.

Critical step must attach the 2 inch extension.
(Photo 2A)

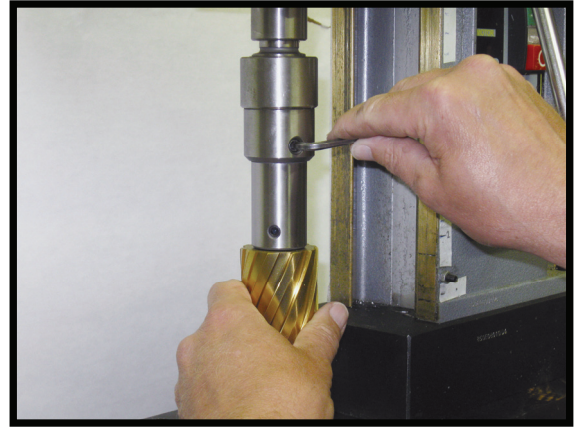


Photo 2A

- b. First time use, reamer must be mounted to arbor. Place reamer over arbor, interlocking reamer taper against arbor taper and aligning notches. (Photo 2B)

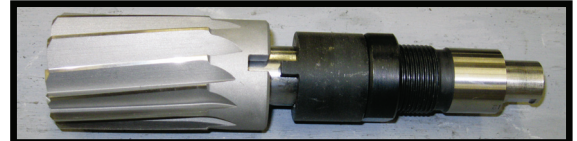


Photo 2B

Firmly strike small end of arbor against surface to assure proper taper interlock.

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. (Photo 2C)

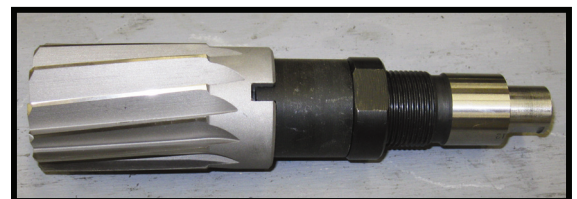


Photo 2C

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

Axle Pro Equipment Instruction Guide

Step 3: Axle Alignment Assembly

- a. Install four threaded rods with welded nuts against upper plate. (upper plate has no cut out) Do Not Tighten.
- b. Install adjusting threaded rod with welded nut against upper plate plus one additional nut. Do Not Tighten (See Photo 3A)

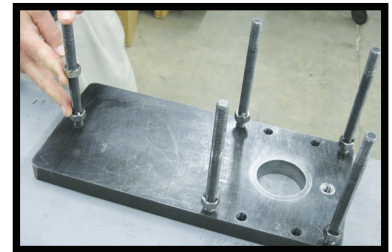


Photo 3A

- c. Place upper plate over upper centering mandrel with threaded rods pointing down. (See Photo 3B)

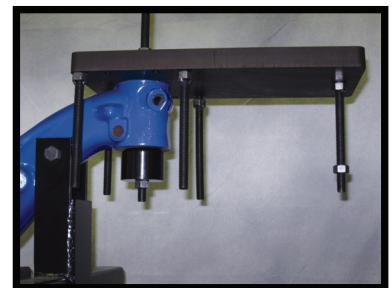


Photo 3B

- d. 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 Photo 3C)



Photo 3C

- e. While holding lower plate in place, place nuts onto five exposed threaded rods far enough to insure plate will not fall.

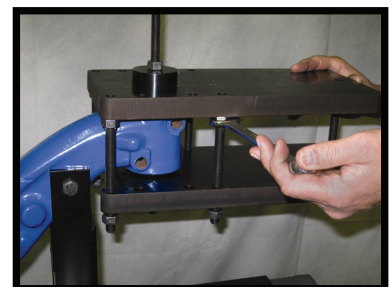


Photo 3D

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

Axle Pro Equipment Instruction Guide

Step 3: Axle Alignment Assembly Cont...

- f. 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 Photo 3D)

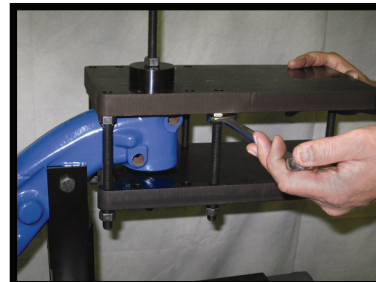


Photo 3D

- g. Ensure plates are mounted squarely onto axle. Visually check for gap between plates and axle. (See Photo 3E)

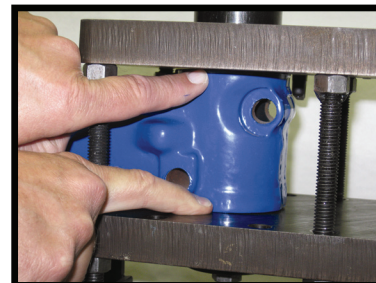


Photo 3E

- h. Ensure mounting plates are securely attached. Inspect this by grasping upper plate and attempt to move side to side. **Plates must be secure.** (See Photo 3F) **If loose, then tighten nuts again & re-check.**

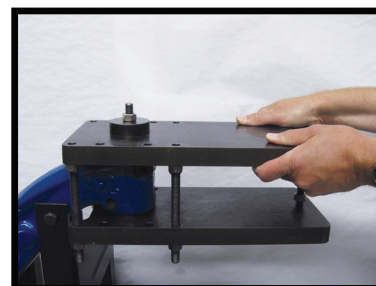


Photo 3F

- i. Remove one of the nuts holding centering mandrel together and remove mandrels. (See Photo 3G)

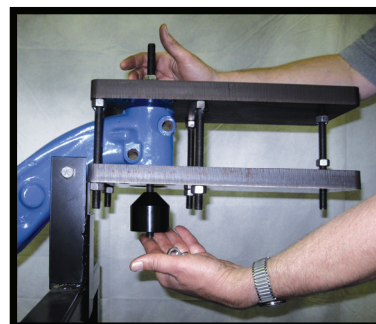


Photo 3G

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

Axle Pro Equipment Instruction Guide

Step 4: Leveling Bar & Drill Speed Setup

- a. Place narrow edge of leveling bar against upper plate
(See Photo 4A)

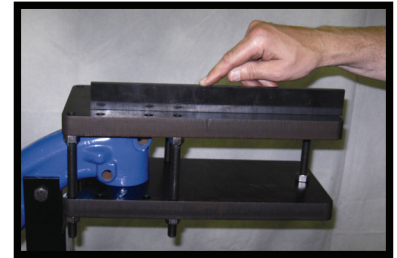


Photo 4A

- b. 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 Photo 4B)

It is crucial to drilling accuracy that plate be properly adjusted.

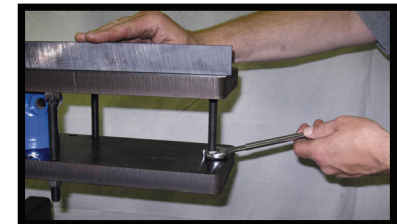


Photo 4B

- c. Set proper drill speed: **All holes are to be cut at 110 RPM.**
(See photo 4C)

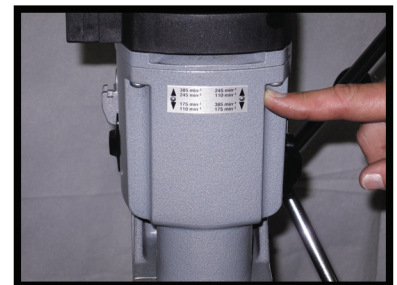


Photo 4C

- d. Find switches as seen in photo 4D and put in proper position to ensure accurate drilling.

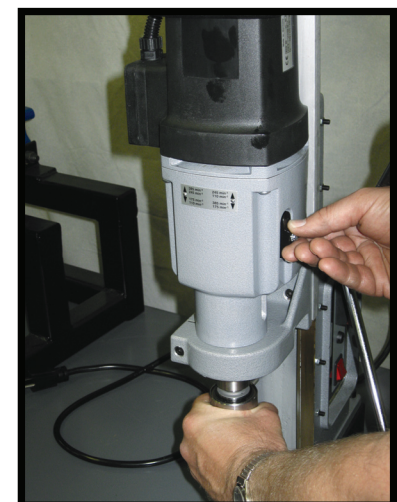


Photo 4D

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

Axle Pro Equipment Instruction Guide

Step 5: Alignment Bushing & Drill Placement

- a. Place alignment bushing in upper plate hole.
(See photo 5A)



Photo 5A

- b. 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.** (Photo 5B)



Photo 5B

- c. Align cutter into alignment bushing. (See Photo 5C)

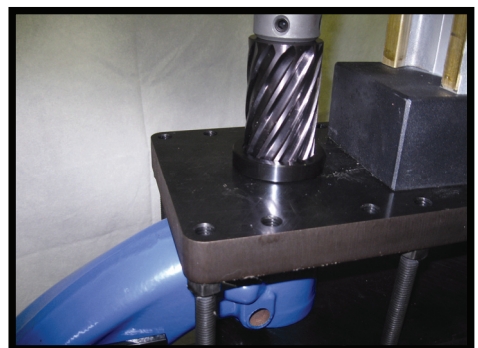


Photo 5C

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

Axle Pro Equipment Instruction Guide

Step 6: Engage Magnet & Assemble Coolant System

- a. Engage drill magnet. (Photo 6A)

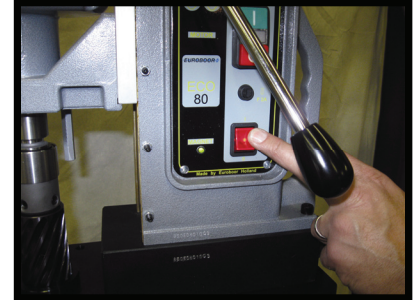


Photo 6A

- b. Remove alignment bushing prior to cutting axle. (Photo 6B)

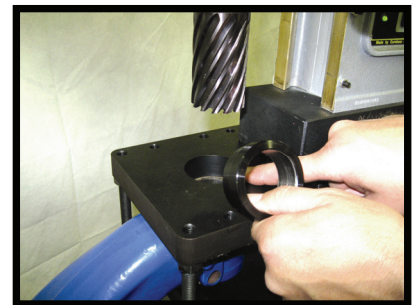


Photo 6B

- c. Assemble the coolant system: Put pump into the bucket. Add 3 pints of coolant and 3 gallons of water and mix thoroughly. (Photo 6C) **System comes with 3 pints of concentrated coolant. Dilute 3 pints of concentrate with 3 gallons of water.**

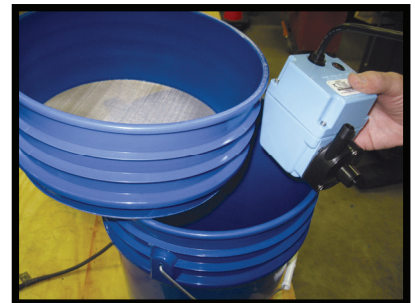


Photo 6C

- d. Thread coolant hose through notch in bucket. Attach screen. Place magnetic base manifold on upper plate and align nozzles over axle eye. (Photo 6D). **Be sure to leave enough room for cutter clearance to allow coolant to flow without damage to the nozzles.**

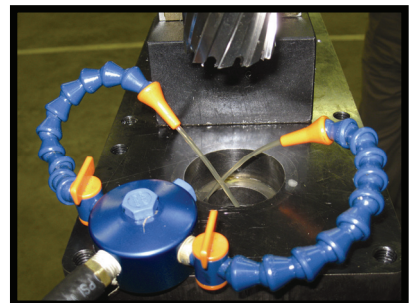


Photo 6D

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

Axle Pro Equipment Instruction Guide

Step 7: Drilling Procedure

- a. Turn coolant on and ensure steady flow into axle throughout drilling process. (Photo 7A)

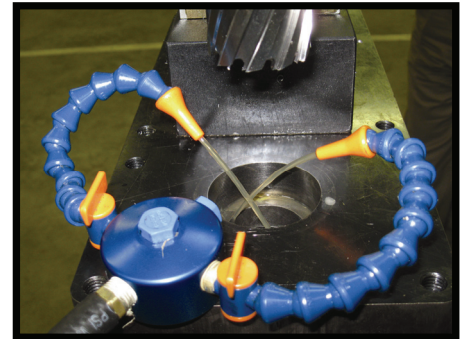


Photo 7A

- b. Start drill motor, carefully lower cutter into upper plate and slowly begin cutting process. Slow/steady cutting motion is important. (Photo 7B)

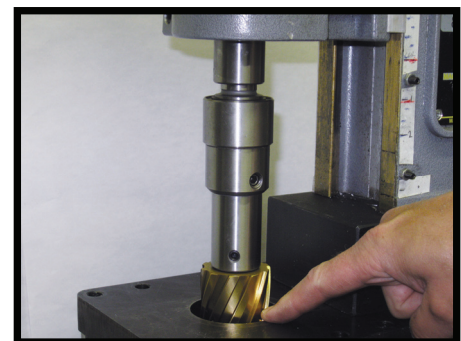


Photo 7B

- c. 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. (Photo 7C)

- d. Continue with cut until an additional one third of bore (2/3 total) has been drilled. Repeat cleaning process of step c.

- e. 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.**

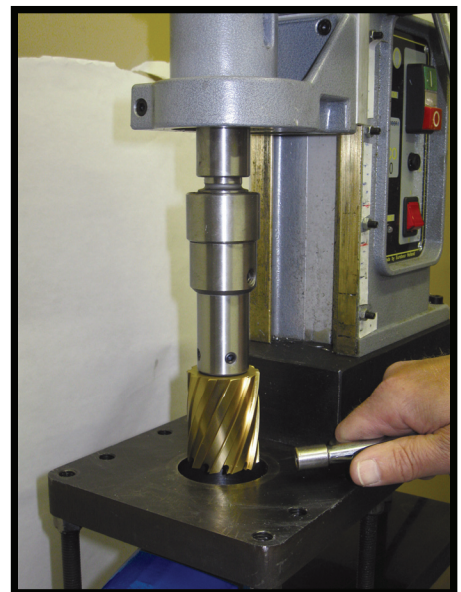


Photo 7C

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

Axle Pro Equipment Instruction Guide

Step 8: Second Pass Reaming Process

a. **DO NOT DISENGAGE MAGNET!**

b. Remove cutter from drill motor. (Photo 8A)



Photo 8A

c. Install mounted reamer into drill motor using Allen wrenches. (Photo 8B)

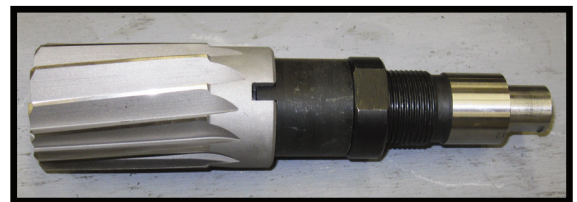


Photo 8B

d. Turn coolant on to ensure steady flow into axle throughout reaming process. (Photo 8C)

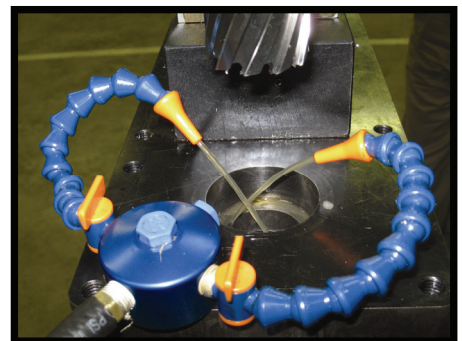


Photo 8C

e. 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).

f. After reaming is complete, raise reamer; turn off drill, coolant & magnet. Remove drill from upper plate.

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

Axle Pro Equipment Instruction Guide

Step 9: Sleeve Installation

- a. Begin sleeve installation by placing lead into top of axle bore visually aligning lock pin cutouts. (Photo 9A)

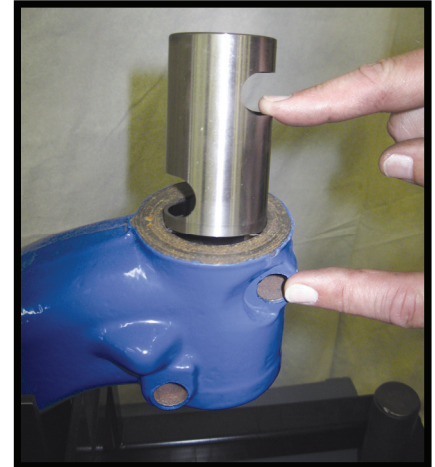


Photo 9A

- b. Using a STEMCO Kaiser bushing driver and brass hammer drive axle sleeve into position until flush. (Photo 9B)



Photo 9B

- c. The axle eye is enhanced; proceed with the installation of your STEMCO Kaiser king pin kit.



Photo 9C

If you have any questions, please contact
STEMCO Kaiser Tech Line: 888-854-6474 Ext# 7.

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

Part Listing

APE Master Kits

APE Kit

85.056.07
85.103.19
85.120.05
85.122.05
85.147.05
85.931.12
85.999.99

Everything needed to cut

APE Cutter Kits

Kit

84.056.07
84.103.19
84.120.05
84.122.05
84.147.05
84.931.12

Includes the modified arbor in the kit

APE Cutter Replacements

Part

87.056.07
87.103.19
87.120.05
87.122.05
87.147.05
87.931.12

Does not include the modified arbor in the kit

Sleeve Drivers

ST70-2T
ST70-4T
ST70-6T
ST70-7T
ST70-12T
ST70-23T

Standard Sleeves

Part

Application

91.056.07	K55G & K56G
91.101.09	K101I
91.120.05	K120E
91.122.05	K122E
91.146.05	K146E
91.180.05	K180E
92.102.09	K102I
92.931.12	KH931L
92.961.12	K961L
93.103.19	K103S
93.147.05	K147E

Tighter Clearance Sleeve Options

Part

Application

91.056.07T	K55G & K56G
91.101.09T	K101I
91.120.05T	K120E
91.122.05T	K122E
91.146.05T	K146E
91.180.05T	K180E
92.102.09T	K102I
92.931.12T	KH931L
92.961.12T	K961L
93.103.19T	K103S
93.147.05T	K147E



Visit www.stemcokaizer.com or call 888-854-6474
4641 Industrial Drive - Millington, MI 48746

March 7, 2011

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 #
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
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
O2ADA, O2ADB, O2AEM 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
O2AEM 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
O2-ADC, O2-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, E1322	K122E	85.122.05	84.122.05	87.122.05	83.122.05	82.122.05	ST70-7T	91.122.05
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
E1460	K146E	85.147.05	84.147.05	87.147.05	83.147.05	82.147.05	ST70-23T	91.146.05

For your protection, Use Standard Shop Safety Procedures during this process

01 577 0092

AUGUST 2011



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
KG5150	K150KG	85.931.12	84.931.12	87.931.12	83.931.12	82.931.12	ST70-12T	91.150.07
EFA18F3/4, EFA20F4	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
FF-931	K931L	85.122.05	84.122.05	87.122.05	83.122.05	82.122.05	ST70-7T	92.961.12
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
17100, 17101, FG-931, FG-941, FG-943	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

Axle Pro Equipment Instruction Guide

Example part breakdown

PART NUMBER	SUBORDINATE PART NUMBER	PART DESCRIPTION	QTY
85.122.05		<i>APE Master Kit</i>	1
	80.105.01	DRILL MOTOR	1
	80.110.01	UPPER PLATE	1
	80.115.01	LOWER PLATE	1
	80.120.01	CENTERING MANDREL	2
	80.125.01	CENTERING ROD	1
	80.130.01	THREADED ROD WITH NUTS ATTACHED	5
	80.135.01	1/2-13 NUTS	8
	80.140.01	LEVELING BAR	1
	80.145.01	CONCENTRATED COOLANT 16 OZ	3
	80.160.01	COMPONENT CASE	1
	80.165.01	METAL NAME TAG	1
	80.211.01	2" ARBOR EXTENSION	1
	80.405.01	5 GALLON PAIL	1
	80.406.01	BUCKET SCREEN	1
	80.410.01	COOLANT PUMP	1
	80.415.01	SILICONE COOLANT HOSE 1FT	5
	80.420.01	BRASS HOSE BARB	1
	80.425.01	MAGNETIC BASE MANIFOLD	1
	80.430.01	LOC-LINE FLEXIBLE HOSE	4
	80.435.01	LOC-LINE ROUND NOZZLE	2
	80.440.01	LOC-LINE 1/4" NPT MALE VALVES	2
	80.445.01	RARE EARTH MAGNET	1
	80.450.01	ELECTRICAL SWITCH	1
	80.455.01	BUCKET LOGO	1
	83.122.05	APE CUTTER 48mm/K122E	1
	82.122.05	AXLE PRO SHELL REAMER (1 15/16")	1
	86.122.05	ALIGNMENT BUSHING	1
	80.209.01	MODIFIED SHELL ARBOR	1
	ST70-7T	SLEEVE DRIVER	1
PART NUMBER	SUBORDINATE PART NUMBER	PART DESCRIPTION	QTY
84.931.12		<i>AXLE PRO CUTTER (2.165")</i>	1
	83.931.12	APE CUTTER (2 1/8"/KH931L)	1
	82.931.12	AXLE PRO SHELL REAMER (55MM/KH931L)	1
	86.931.12	ALIGNMENT BUSHING	1
	80.209.03	MODIFIED SHELL ARBOR	1
	EW10X4X3	KIT BOX	1
	ST70-12T	SLEEVE DRIVER	1

