Pro-Tools

MADE IN THE U.S.A.

105-B BENDER

INSTRUCTION SET

“THE BRUTE”

Trick-Tools.com
80 Truman Road
Pella, IA 50219
Phone:1-877-VAN-SANT
E-mail: sales@trick-tools.com

GUARANTEED NO JUNK Trick-Tools.com

105-SB BENDER

WARRANTY POLICY

ALL PRODUCTS ***PRO-TOOLS*** MANUFACTURES CARRY A ONE YEAR GUARANTEE AGAINST DEFECTS IN MATERIAL OR WORKMANSHIP. (PRODUCTS THAT WE SELL BUT DO NOT MAKE ARE COVERED UNDER THAT MANUFACTURING WARRANTY PLAN). ANY TOOLS OR PARTS THAT FAIL ARE 100% COVERED UNDER THE WARRANTY AND WILL BE REPAIRED FREE OF CHARGE (EXCLUDING FRIEGHT CHARGES). MISUSE OR ABUSE IS NOT COVERED. SIMPLY CALL AND GET A WARRANTY AUTHORIZATION NUMBER AND IT WILL BE PROMPTLY AND CHEERFULLY TAKEN CARE OF.

⚠ *SAFETY WARNINGS* ⚠

•ALWAYS READ AND UNDERSTAND DIRECTIONS THAT ARE INCLUDED WITH ALL PRO-TOOLS EQUIPMENT BEFORE OPERATING. IF DIRECTIONS ARE NOT INCLUDED, CALL PRO-TOOLS IMMEDIATELY.

•USE OF FABRICATION EQUIPMENT MAY PRESENT A PINCH OR CRUSH HAZZARD.

•ALWAYS OPERATE PRO-TOOLS EQUIPMENT WEARING SAFETY EQUIPMENT.

•ALWAYS USE THE CORRECT EQUIPMENT FOR THE PROJECT.

•NEVER USE PIPE BENDING DIES ON A TUBE OR TUBE DIES ON A PIPE.

•KNOW THE MATERIALS YOU ARE USING BEFORE BEGINNING FABRICATION.

•ALWAYS INSPECT EQUIPMENT PRIOR TO USE TO MAKE SURE IT IS IN GOOD WORKING ORDER. IF YOU ARE IN DOUBT, DO NOT USE AND CONTACT PRO-TOOLS.

•NEVER SUBSTITUTE COMPONENTS FROM OTHER EQUIPMENT. MAKE SURE COMPONENTS MATCH.

•NEVER EXCEED THE MANUFACTURER'S SPECIFICATIONS SET BY PRO-TOOLS.

•***ALWAYS LUBRICATE METAL ON METAL PARTS!!!!***

105-SB BENDER
-CONTENTS-

WHEN YOU RECEIVE YOUR MB-105-SB “BRUTE” BENDER, YOU WILL HAVE 3 PACKAGES.

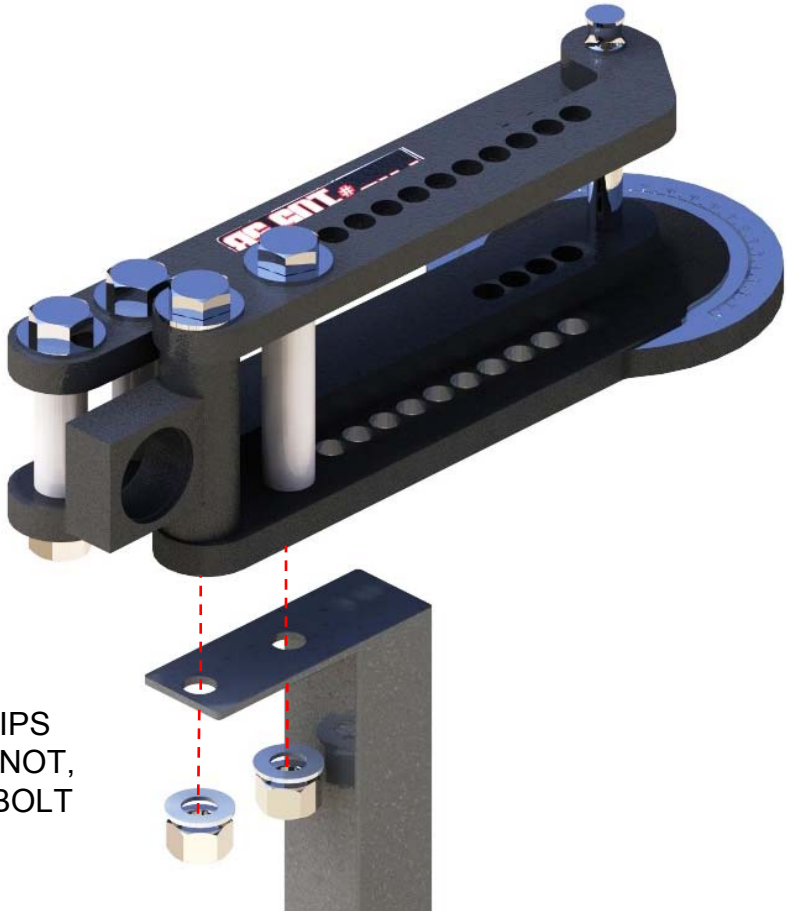
1) MB-105-SB BENDER
2) HYDRAULIC ASSEMBLY
3) STAND.

PACKAGE 1

PACKAGE 2

PACKAGE 3

105-SB BENDER
-STAND SETUP-



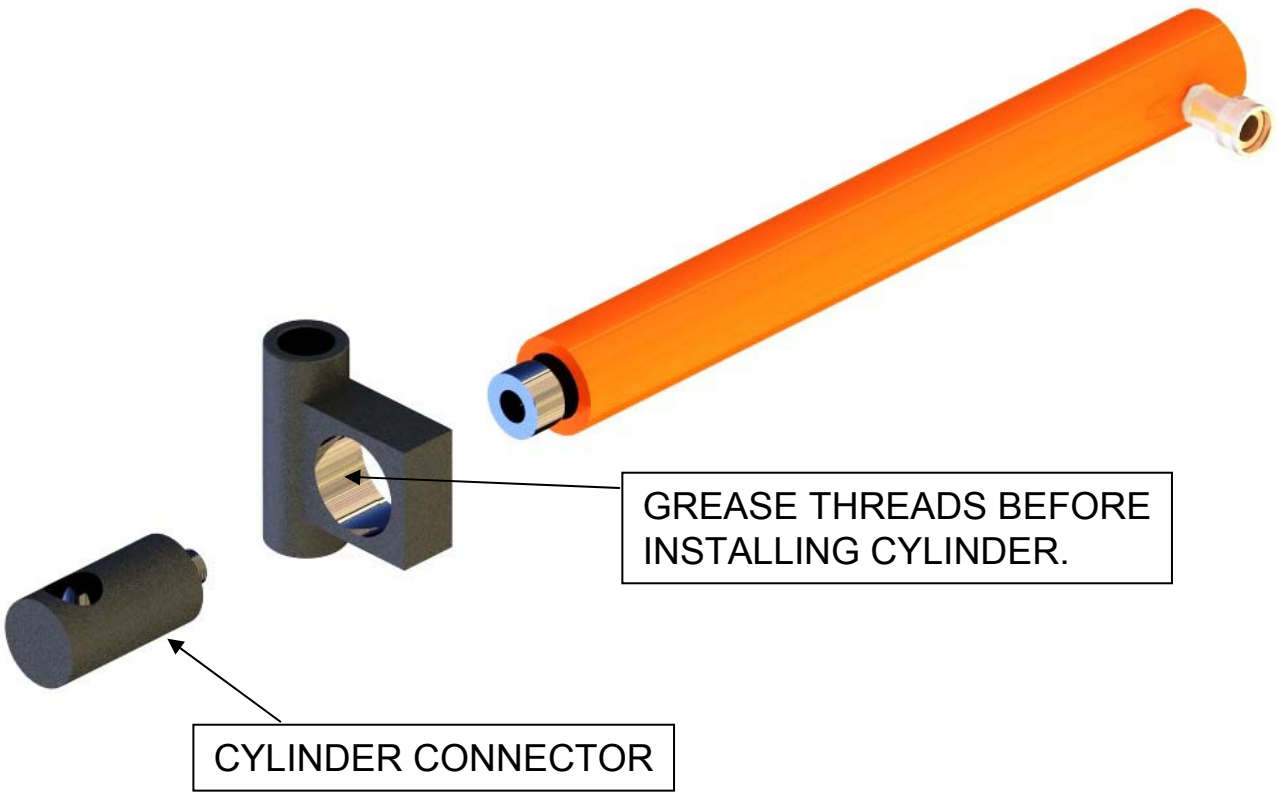
STEP 1
BOLT STAND TO FLOOR

STEP 2
SET BENDER ON STAND
& TIGHTEN BOLTS.

STEP 3
MAKE SURE ONE INCH PIN SLIPS IN & OUT EASILY. (IF IT DOES NOT, YOU WILL HAVE TO LOOSEN BOLT AND REALIGN ARMS.)

AT THIS POINT YOU ARE READY TO INSTALL THE HYDRAULIC AND DIE SET.

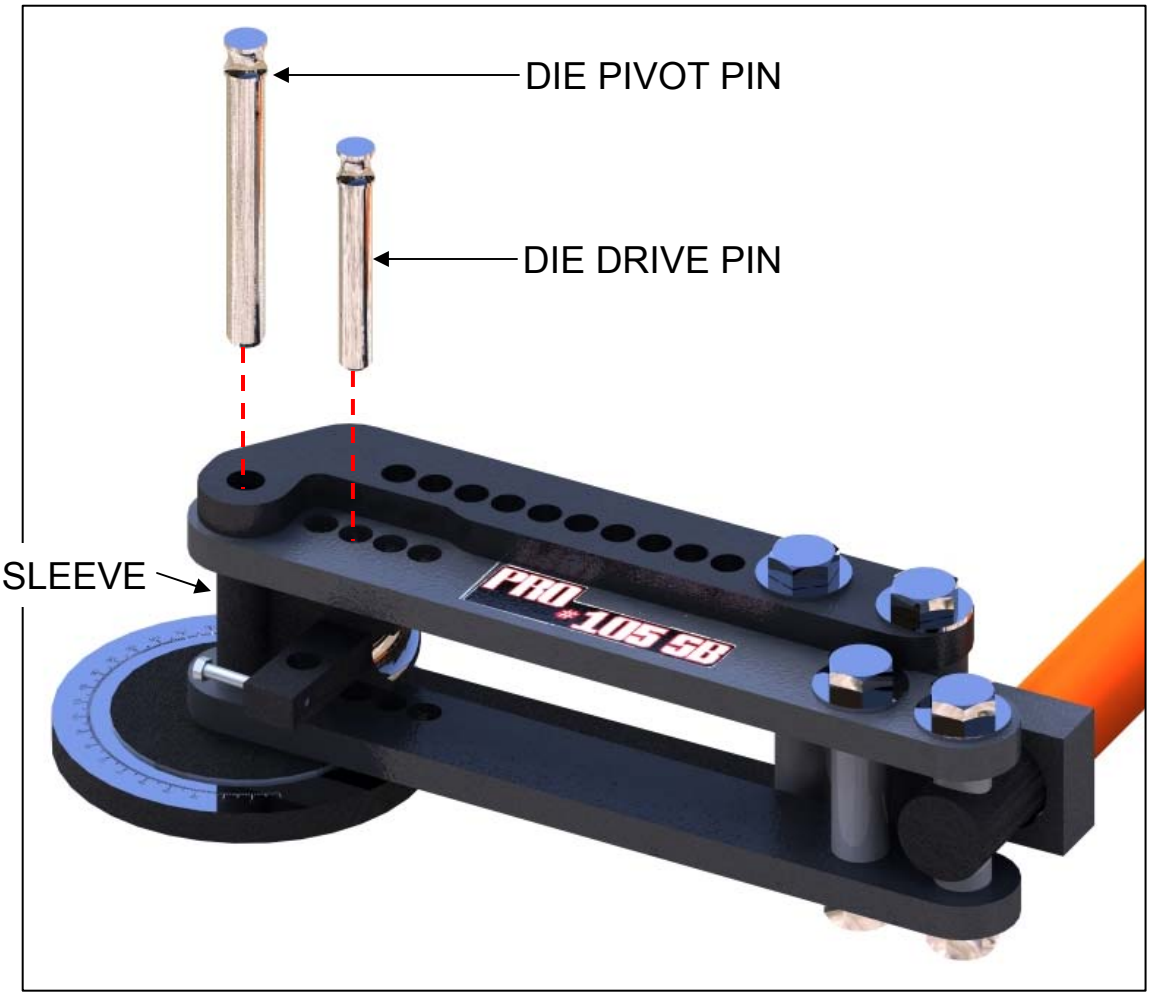
105-SB BENDER
-HYDRAULIC SETUP-



SCREW CYLINDER INTO BRACKET (MAKE SURE IT IS TIGHT OR IT WILL DAMAGE THE THREADS.) AND INSTALL AS SHOWN ON FRONT COVER.

NO WARRANTY ON DAMAGED THREADS.

105-SB BENDER
-DIE INSTALL

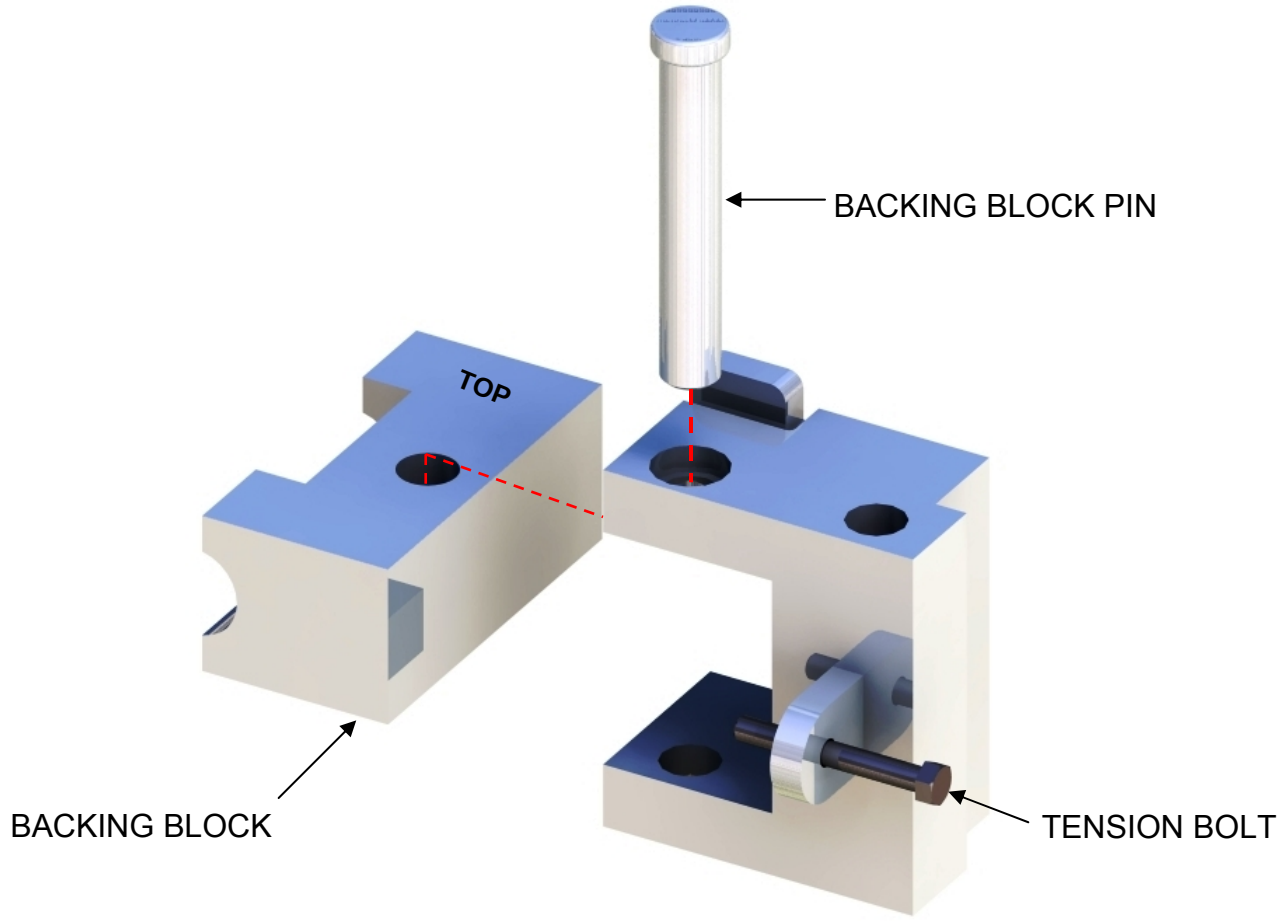


MAIN DIE INSTALL

REMOVE 1” DIE PIVOT PIN, LUBRICATE PIN AND DIE SLEEVE, PLACE DIE IN BENDER FRAME AND SLIDE PIN THOUGH FRAME AND DIE SLEEVE.

INSERT DIE PUSH DRIVE THOUGH SWINGARM & FIRST HOLE OF THE MAIN DIE.

105-SB BENDER
-DIE INSTALL

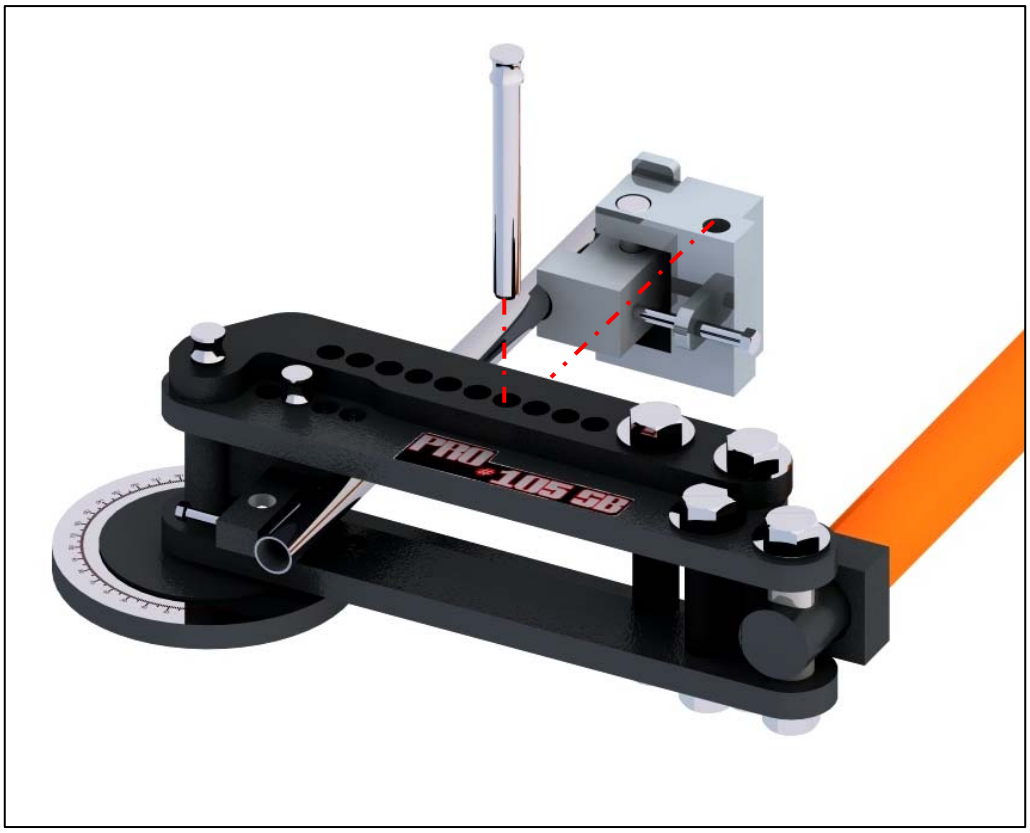


QUICK RELEASE INSTALL

INSERT BACKING BLOCK INTO QUICK RELEASE & INSTALL PIN AS SHOWN TO HOLD BLOCK IN PLACE. (IMPORTANT: MAKE SURE THE WORD "*TOP*" IS FACING UP.)

INSTALL QUICK RELEASE INTO THE BENDER PER INSTRUCTIONS ON PAGE 8.

105-SB BENDER
-DIE INSTALL



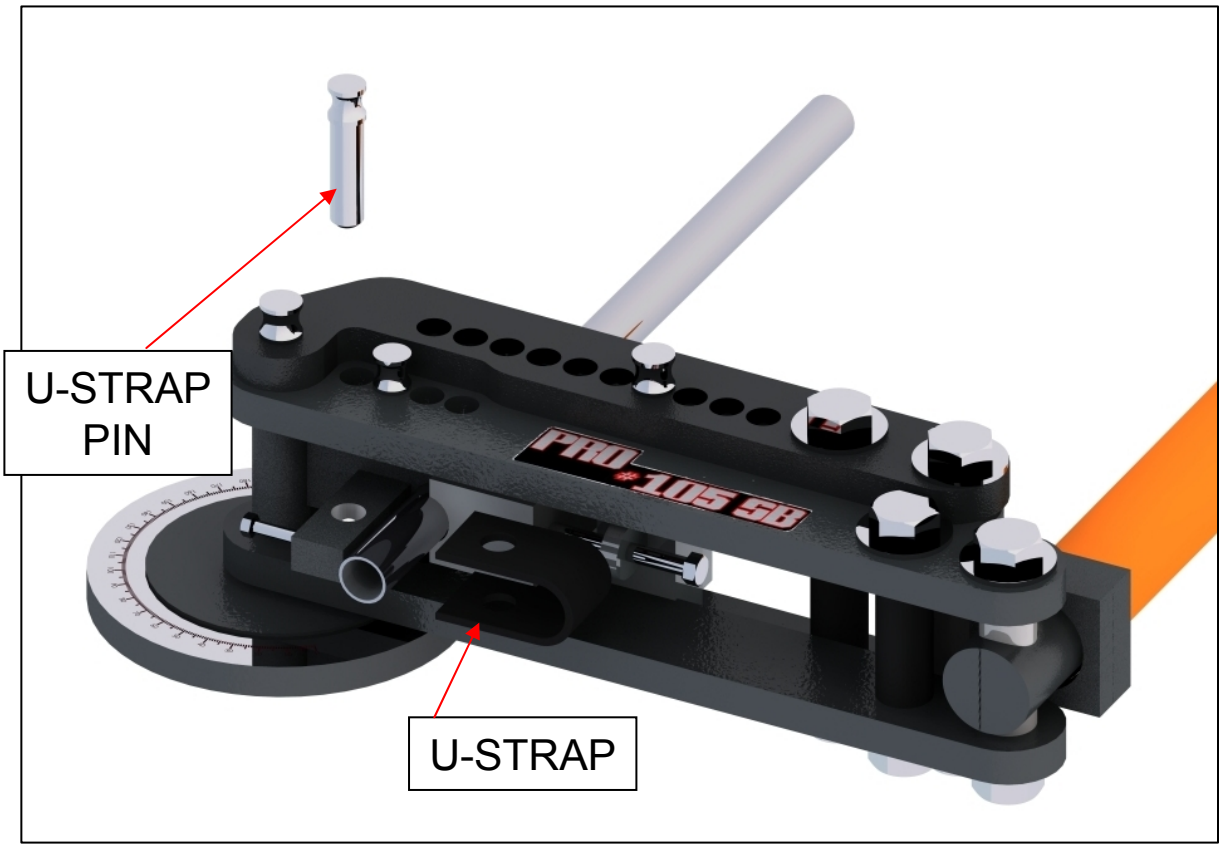
TUBE & BACKING BLOCK INSTALL

BENDER SWINGARMS MUST BE CLOSED AGAINST BENDER FRAME BEFORE INSTALLING TUBE AND & QUICK RELEASE WITH BACKING BLOCK.

INSERT TUBE INTO RADIUS OF MAIN DIE.

PUSH BACKING BLOCK AS TIGHTLY AS POSSIBLE AGAINST TUBE, THEN INSERT PIN THOUGH BENDER FRAME & QUICK RELEASE.

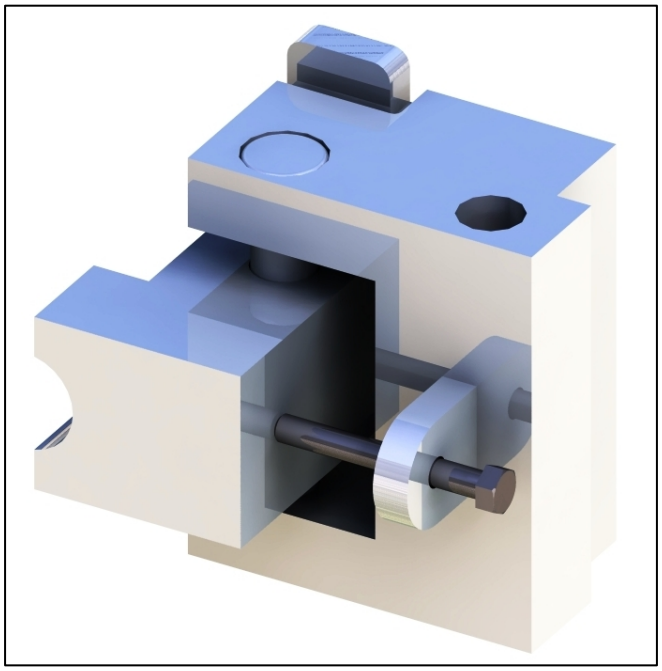
105-SB BENDER
-DIE INSTALL



STRAP & PIN INSTALL

PUSH FIRMLY ON END OF TUBE, PLACE STRAP AROUND TUBE, LINE UP HOLES, THEN INSERT PIN THOUGH STRAP & DIE TAB.

105-SB BENDER
-DIE INSTALL-



QUICK RELEASE NOTES

THE TENSION BOLT SERVERS TWO PURPOSES:

1) IN MOST CASES IT IS NECESSARY TO KEEP TENSION ON THE BOLT TO PREVENT THE RELEASE FROM OPENING UP AND PREMATURELY RELEASING THE TUBE.

2) WHEN APPLYING TENSION ON THE BOLT YOU DO NOT WANT TO OVER-TIGHTEN THE BOLT. ONLY APPLY ENOUGH PRESSURE TO KEEP THE RELEASE SEATED AND TO PREVENT ANY SPRINGBACK.
(KEEP THREADS WELL LUBRICATED AS THREAD DAMAGE IS NOT COVERED UNDER OUR WARRANTY!)

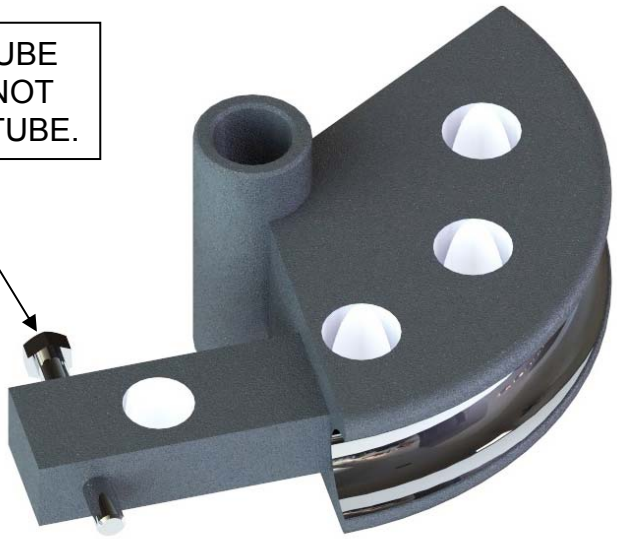
IMPORTANT! BEFORE YOU RELEASE THE CYLINDER AFTER THE LAST STROKE. BACK OFF THE TENSION BOLT SO THE QUICK RELEASE CAN FUNCTION.

105-SB BENDER

-IMPORTANT-

CHECK THESE ITEMS BEFORE STARTING TO BEND.

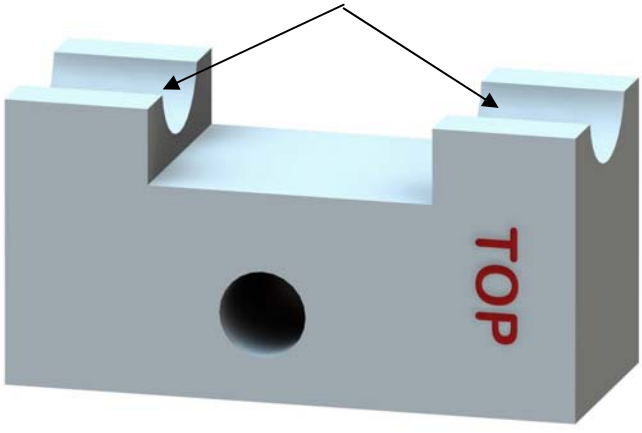
TIGHTEN TENSION BOLT SO TUBE WILL NOT SLIP. BE CAREFUL NOT TO OVER-TIGHTEN & DAMAGE TUBE.



RADIUS OF MAIN DIE MUST BE CLEAN. *ABSOLUTELY NO GREASE*!

FOR A FRICTION FREE BEND, ALWAYS LUBRICATE THE BACKING BLOCK. ALL PURPOSE WHEEL BEARING GREASE WORKS VERY WELL.

NOTE:
YOUR BACKING BLOCK HAS **"TOP"** STAMPED ON IT. THIS MUST ALWAYS FACE UP.



*******BACKING BLOCKS WILL VARY IN SHAPE & DESIGN. ABOVE IS ONE EXAMPLE.*******

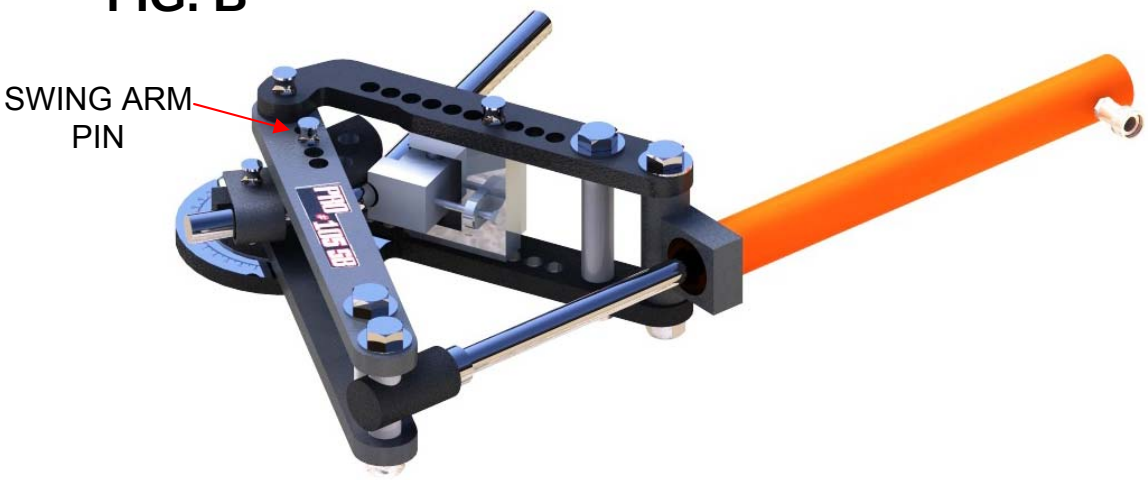
105-SB BENDER
-BENDING INSTRUCTIONS-

FIG. A

STARTING POSITION

*****SWING ARM SHOULD BE FULLY RETRACTED IN MAIN ARMS*****

FIG. B



STEP 1 - EXTEND CYLINDER TO A FULL STROKE

STEP 2 - SNUG BOLT ON QUICK RELEASE, SO DIE DOES NOT SPRING BACK.

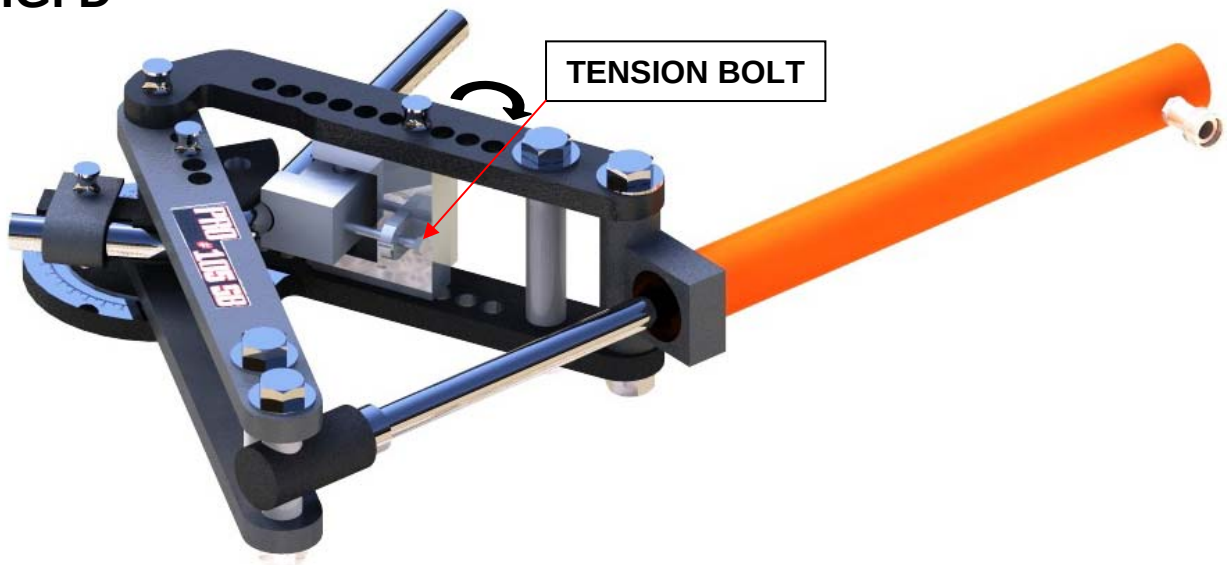
STEP 3 – REMOVE DIE DRIVE PIN AND RETRACT CYLINDER.

105-SB BENDER
-BENDING INSTRUCTIONS-

FIG. C

INSTALL SWING ARM PIN IN NEW HOLE IN DIE & RUN THROUGH STROKE AGAIN.

FIG. D



REPEAT PROCESS AS MANY TIMES AS NECESSARY.

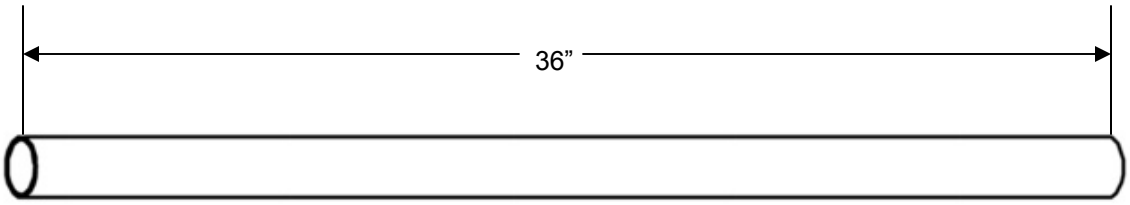
AFTER LAST STROKE BACK OFF TENSION BOLT BEFORE RETRACTING CYLINDER. SWING QUICK RELEASE WITH BACKING BLOCK TOWARD THE REAR OF THE BENDER TO RELEASE TUBE.

BENDING INSTRUCTIONS

IN THE NEXT FEW PAGES, WE ARE GOING TO EXPLAIN A FEW THINGS ABOUT BENDERS & GIVE SOME EXAMPLES & EXPLANATIONS ON MAKING BENDS.

WE ARE GOING TO TAKE YOU THOUGH A ***STEP BY STEP*** PROCEDURE SHOWING YOU HOW TO DETERMINE THE STARTING POINT OF YOUR BEND, HOW TO CALCULATE THE LENGTH OF TUBING YOU NEED TO START WITH, AND AS MANY WAYS AS POSSIBLE FOR YOU TO BE ABLE TO PRODUCE ***PROFESSIONAL, ACCURATE BENDS.***

THE GENERAL RULE, AS FAR AS THE QUALITY OF THE BEND IS AS FOLLOWS: ***THE THICKER THE WALL SIZE AND THE SMALLER THE DIAMETER OF THE TUBING BECOMES, THE BETTER THE BEND.*** THIN WALL TUBING WILL FLATTEN SOMEWHAT ON ITS OUTTER DIAMETER. THIS IS COMPLETELY NORMAL FOR ANY BENDER OTHER THAN A ***TRUE MANDREL BENDER.*** A MANDREL BENDER USES A STEEL BALL OR SIMILAR SHAPED DEVICE WITH AN OUTSIDE DIAMETER SLIGHTLY SMALLER THAN THE INSIDE DIAMETER OF THE TUBING BEING BENT. THIS HAS THE EFFECT OF THINNING THE WALL THICKNESS ON THE OUTSIDE OF THE TUBING. HOWEVER THE ROUNDNESS OF THE TUBING IS PRESERVED ALMOST PERFECTLY. EXHAUST HEADERS ARE BENT WITH ***MANDREL*** BENDERS. IF A COMPANY TELLS YOU THEIR BENDER IS A MANDREL BENDER AND IT DOES NOT USE INSIDE MANDRELS, ***BEWARE!!!*** TRUE MANDREL BENDERS ARE EXTREMELY EXPENSIVE.

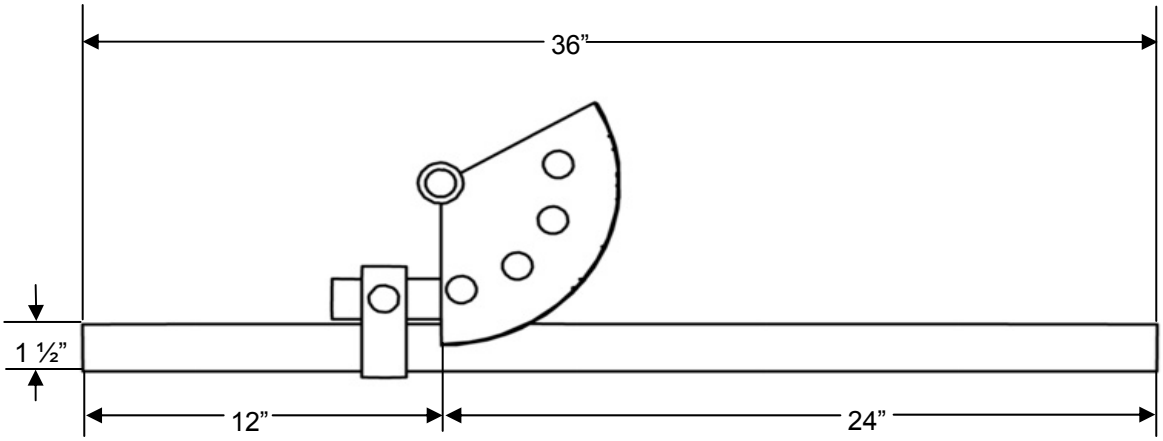


STEP1 THE TUBING FOR OUR TEST IS 1 1/2” x 36” LONG. ONLY ONE PIECE IS NECESSARY TO GIVE YOU ALL THE INFORMATION YOU WILL NEED TO MAKE ACCURATE BENDS. IT IS A GOOD IDEA TO KEEP A NOTEBOOK TO LOT YOUR INFORMATION ON THE TEST BEND. IT WILL BE NECESSARY TO RUN THE SAME TEST FOR EACH SIZE TUBING YOU PLAN TO BEND.

NOTE: EACH SIZE OF TUBING; BENDS, STRETCHES, & USES A DIFFERENT AMOUNT OF TUBING IN THE BEND, SO IT WILL BE IMPORTANT TO LOG THE RESULTS FROM EACH TEST.

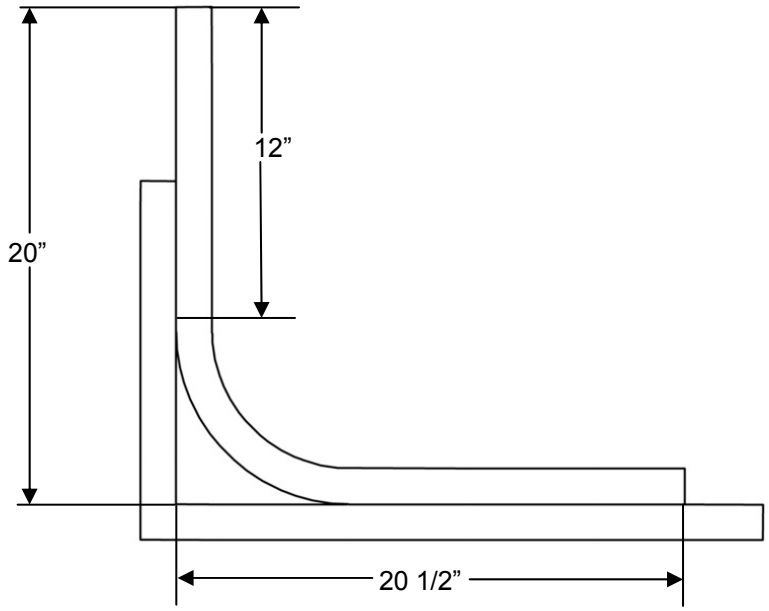
ALSO, ALWAYS KEEP ALL PINS AND ANY “METAL TO METAL” PARTS ON THE BENDER WELL LUBRICATED. THIS WILL GREATLY REDUCE THE AMOUNT OF FORCE NEEDED TO OPERATE THE RATCHET, AND WILL ALSO PREVENT UNNECESSARY WEAR.

BENDING INSTRUCTIONS



STEP 2 TAKE THE 36” LONG PIECE OF TUBING AND MEASURE EXACTLY 12” FROM THE LEFT TO RIGHT. THEN MARK THE TUBE IN THE BENDER AND POSITION THE EDGE OF THE DIE EXACTLY IN THE CENTER OF THE MARK, AS SHOWN IN THE EXAMPLE. THEN MAKE A 90 DEGREE BEND. USE A CARPENTER’S SQUARE TO MAKE SURE YOU HAVE A PERFECT 90 DEGREE BEND. IF YOU OVERBEND, SIMPLY PLACE THE TUBE IN A VISE AND PULL IT BACK TO 90 DEGREES. IF IT IS NOT BENT ENOUGH, PUT THE TUBE BACK IN THE BENDER AND FINISH THE BEND. ***IMPORTANT:*** WITH YOUR TUBE BENT TO 90 DEGREES, BUT STILL IN THE BENDER, CHECK TO SEE IF THE EDGE OF THE DIE IS STILL LINED UP WITH YOUR MARK. IF IT IS, YOUR OK, IFNOT IT WILL BE MECESSARY TO CUT ANOTHER PIECE OF TUBING AND REPEAT THE TEST. ***THE MARK MUST BE LINED UP WITH THE DIE IN ORDER FOR YOU TO GET ACCURATE INFORMATION ON YOUR TEST.***

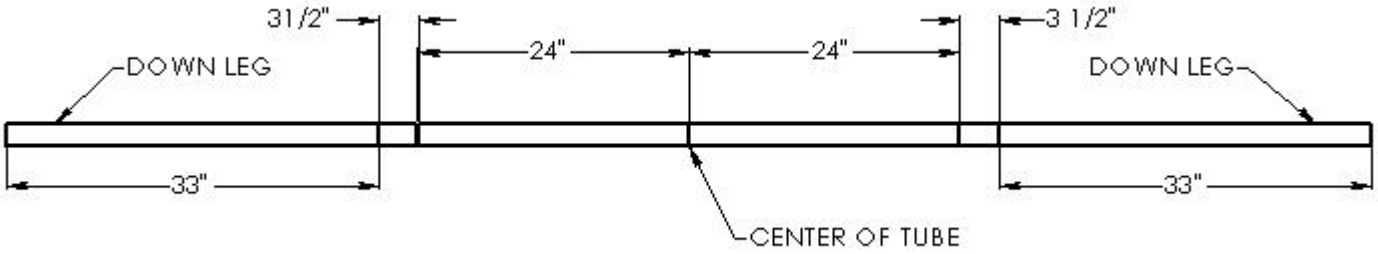
STEP 3 IN STEP 3 WE HAVE FINISHED THE BEND AND TAKEN A MEASUREMENT BY PLACING A CARPENTER’S SQUARE AGAINST THE BACK OF THE TUBING THEN RUNNING OUR RULER FROM THE SQUARE TO EACH END OF THE TUBING. IN THIS EXAMPLE WE ARE USING 1 1/2” TUBING AND A 6” RADIIUS DIE. WE SEE THE SIDE WITH OUR 12” MARK IS NOT 20” LONG, AND THE 24” SIDE IS 20 1/2” LONG. WE HAVE GAINED 8” ON THE 12” SIDE AND LOST 3 1/2” ON THE 24” SIDE. IN THE NEXT FEW STEPS WE WILL SHOW YOU HOW TO APPLY THIS KNOWLEDGE TO YOUR PROJECT.



BENDING INSTRUCTIONS

STEP 4

WE ARE NOW READY TO START A BENDING PROJECT. IN OUR EXAMPLE WE WILL FABRICATE THE MAIN HOOP FOR THE ROLLBAR ON A RACE CAR. WE USE THIS PROJECT BECAUSE IT IS A JOB REQUIRING MULTIPLE BENDS AND CLOSE TOLERANCES. WE ARE USING 1 1/2" TUBING, AND WE WANT A WIDTH OF 48" AND A HEIGHT OF 40" WHEN COMPLETED.



A. DRAW A PICTURE OF A PIECE OF TUBING.

B. WE KNOW WE WANT A WIDTH OF 48"

C. MARK TUBE IN CENTER.

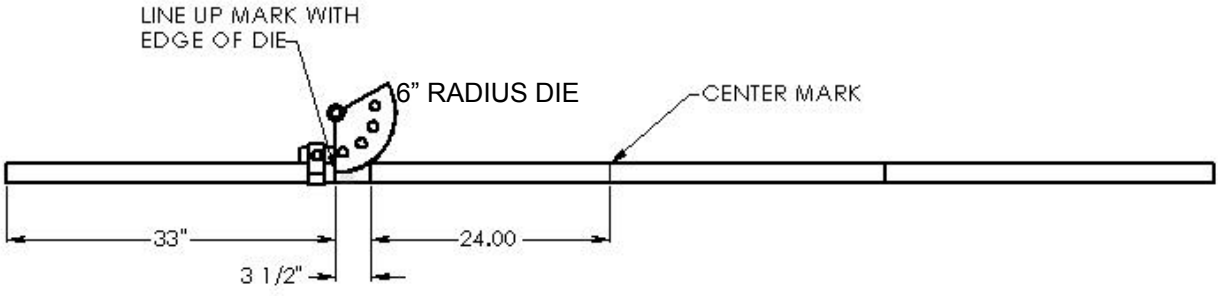
D. 1/2 OF 48" IS 24". MEASURE FROM THE CENTER OF THE TUBE TO THE RIGHT 24" AND MARK THE TUBE. MEASURE FROM THE CENTER OF THE TUBE TO THE LEFT 24" AND MARK THE TUBE.

E. ADD ON 3 1/2" ON EACH SIDE, EBCAUSE WE KNOW THAT IT WILL SHORTEN UP THIS AMOUNT.

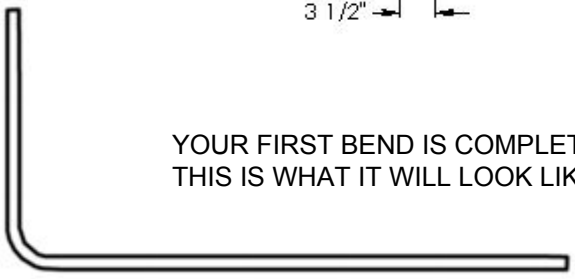
F. WE WANT A DOWN LEG OF 40" AND FROM OUR TEST WE KNOW THE BEND WILL ADD 8" TO THE LEG. IN THIS PROJECT WE WILL NEED 32" OF TUBING ON EACH END, BUT HAVE ADDED AN EXTRA INCH FOR A SAFTEY FACTOR. IT IS BETTER TO CUT A SMALL AMOUNT OFF THAN TO HAVE YOUR TUBE COME UP SHORT.

STEP 5

LINE UP TUBING IN BENDER AS SHOWN AND MAKE THE FIRST BEND.



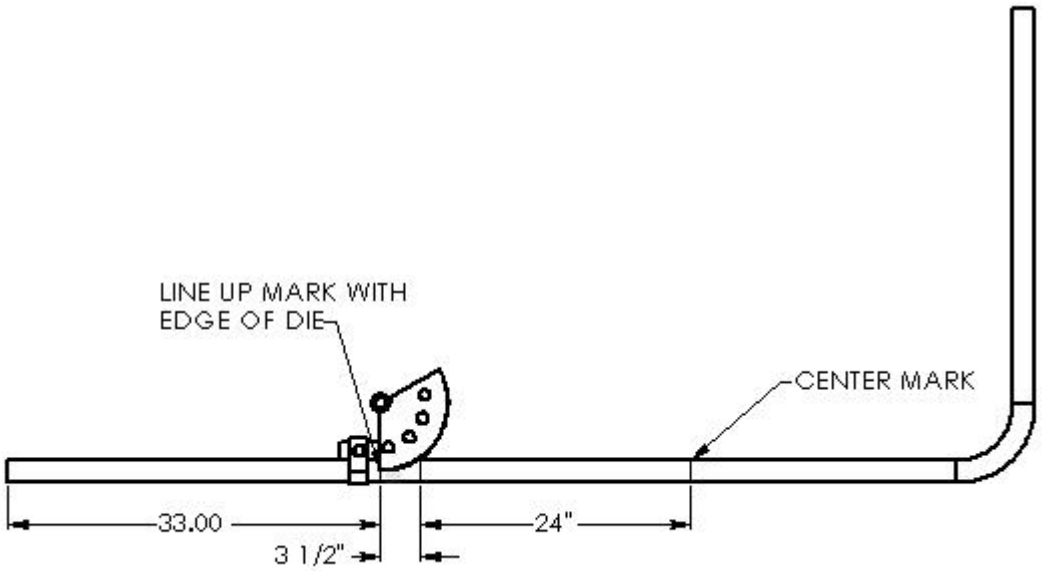
YOUR FIRST BEND IS COMPLETED AND
THIS IS WHAT IT WILL LOOK LIKE.

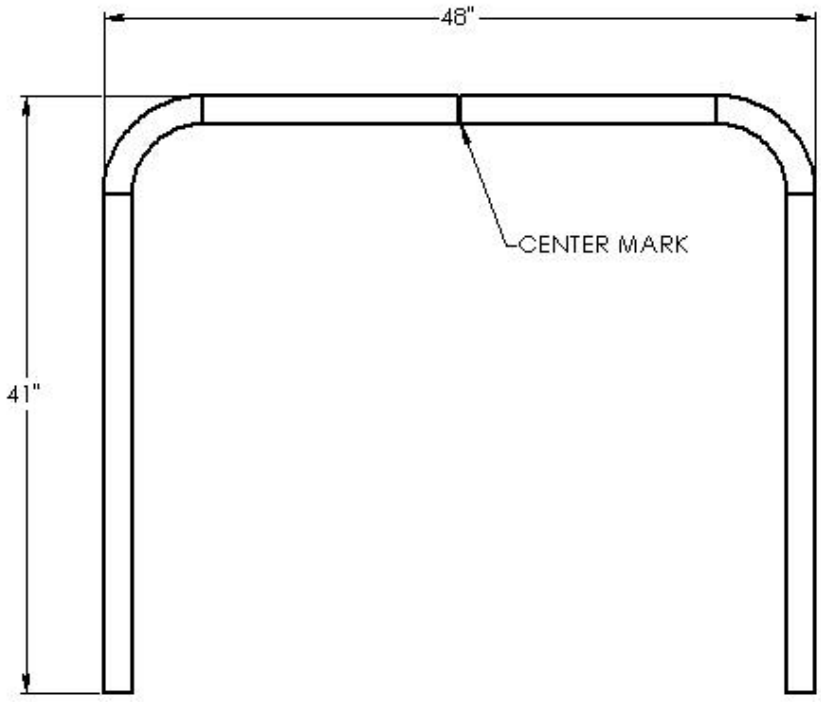


BENDING INSTRUCTIONS

STEP 6

INSTALL TUBING IN BENDER AS SHOWN AND COMPLETE THE LAST BEND.

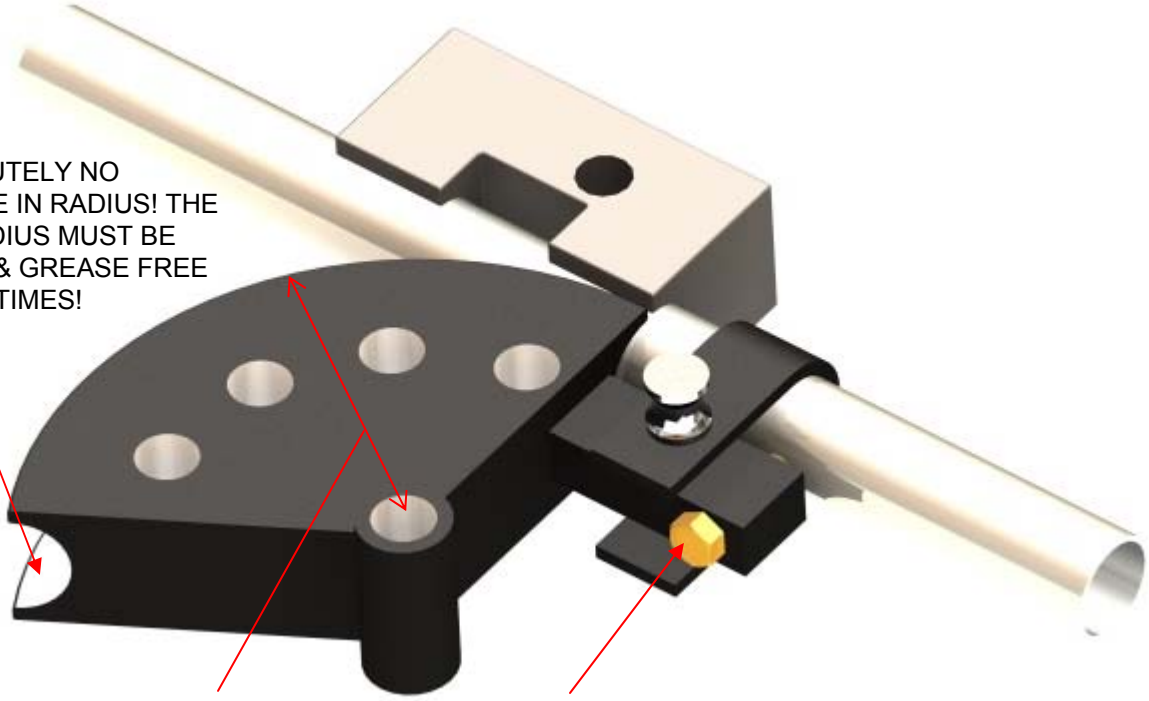




AT THIS POINT YOUR ROLLBAR IS COMPLETE, BUT WE WOULD LIKE TO OFFER ON REMINDER. ALWAYS WORK ALL BENDS OFF THE CENTER MEASUREMENT BECAUSE DIIFFERENT METALS STRETCH DIFFERENTLY & IF YOU MAKE A MISTAKE ON THE FIRST BEND YOU CAN MAKE AN ADJUSTMENT ON THE SECOND BEND TO CORRECT THE PROBLEM.

HELPFUL INFORMATION

NOTE: ALL ROUND TUBE RADIUS MEASUREMENTS ARE “CENTER LINE RADIUS”



NOTE:
TO CALCULATE LENGTH OF TUBING USED IN A BEND, MULTIPLY RADIUS OF BEND X 6.28 X DEGREE OF BEND, THEN DIVIDE BYE 360

EXAMPLE:
6 INCH RADIUS, 90 deg. BEND WOULD BE:
6 x 6.28 x 90 / 360= 9.42

IMPORTANT! LUBRICATING ALL PINS AND “METAL TO METAL” SURFACES WITH ALL PURPOSE BEARING GREASE WILL GREATLY REDUCE THE EFFORT NECESSARY TO OPERATE THE BENDER AND AT THE SAME TIME WILL GREATLY INCREASE THE OVERALL LIFE OF THE BENDER.
REMEMBER, GREASE IS OKAY EVERYWHERE EXCEPT IN THE RADIUS OF THE MAIN DIE.
THEN MAIN DIE MUST REMAIN DRY AT ALL TIMES OR THE TUBING COULD SLIP AND KINK.

PLEASE NOTE:

WE HAVE VERY SIMPLE COMPUTER PROGRAMS AVAILABLE THAT WILL LAY OUR YOUR JOB FOR YOU, IF YOUR BENDING REQUIREMENTS BECOME TOO COMPLEX.

WE APPRECIATE YOUR PURCHASING A PRO BENDER AND WE BELIEVE IF YOU FOLLOW THE DIRECTIONS, WITH A LITTLE PRACTICE, YOU’LL BE PRODUCING PROFESSIONAL ACCURATE BENDS EASILY.

Pro-Tools
MADE IN THE U.S.A.

FAQ's

Q: WHAT SIZE MATERIAL CAN I BEND WITH THE BRUTE?

A: UP TO 2 ½"x .134 WALL STEEL TUBE AND 2" SCHEDULE 40 PIPE.

Q: THE TUBE IS STUCK IN THE BENDER?

A: SNUG THE TENSION BOLT ON THE QUICK RELEASE, THEN BACK OFF THE RAM.

Q: CAN I UPGRADE THE HYDRAULIC CYLINDER?

A: NO. THE HYDRUALIC CYLINDER IS PERFECTLY MATCHED FOR THE BEST RESULTS.

Q: CAN I CHOOSE WHICH HYDRAULIC PUMP I WANT?

A: YES THE MB-105-SB WILL WORK WITH EITHER AIR OR ELECTRIC PUMPS.

Q: IS THE BRUTE BENDER ONLY HYDRUALIC OR CAN I USE IT MANUALLY?

A: IT CAN ONLY BE USED HYDRAULICALLY DUE TO ITS SIZE AND ENGINEERING. IT WOULD TAKE A GRET DEAL OF LEVERAGE TO USE MANUALLY.

Q: THE CYLINDER IS NOT SEATED CORRECTELY IN THE BLOCK. CAN I RETURN IT?

A: UNFORTUNATELY NO. WE DO NOT WARRANTY THE THREADS ON ANY PRODUCT WE SELL OR MANUFACTURE.

Q: HOW DO I LIMIT THE SCRATCHES ON THE MATERIAL I AM BENDING?

A: TO LIMIT DAMAGE TO MATERIAL MAKE SURE YOUR MATERIAL & DIE IS WIPED CLEAN AND DEBURRED. MAIN DIE STAYS DRY!! LUBRICATE BACKING BLOCK ONLY! DELRIN BACKING BLOCK IS AVAILABLE FOR ANODIZED ALUM. OR POLISHED SS.