PROCESS SPECIFICATION 187

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Design Criteria and Installation and Extraction Procedures for Lee Hydraulic Inserts

Innovation in Miniature

The Lee Company

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Revision M

Design Criteria and Installation and Extraction Procedures for Lee Hydraulic Inserts

Innovation in Miniature

LEE

Unlimited Distribution

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19-20 & 34-36	M	8/29/16	R. Merrick	R. Merrick	Updated addresses & telephone numbers; updated Section III

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INTRODUCTION

This process specification is a comprehensive design and procedural guide to the installation and extraction of Lee inserts. Section I, entitled Design Information, gives extensive information and recommendations to aid in safely designing housings for Lee insert installations. This section recommends installation hole parameters and discusses stress corrosion cracking and the prevention thereof.

Section II, entitled Inspection and Handling, discusses Lee Quality Control procedures, certifications, and important handling requirements.

Section III, entitled Installation and Extraction of Lee Inserts, describes the installation and extraction techniques for Lee Inserts. The tool set drawings pertaining to installation and extraction of Lee Inserts are included in Appendix B.

The information found here is more extensive than that found in the Lee Technical Hydraulic Handbook. Compliance with the more detailed procedures and recommendations provided in this report will ensure maximum performance.

SECTION I - Design Information

Proof, Burst, and Retention Pressure Ratings

Conventional hydrostatic proof and burst pressure testing applies equal pressure to all parts of a Lee restrictor or flow control insert. The Lee insert is therefore unaffected. Maximum hydrostatic pressure in this condition is limited only by the strength of the housing into which the Lee insert is installed.

With pressure applied in the flowing direction, conventional hydrostatic proof and burst pressure testing applies equal pressure to all parts of a check valve; in the case of a pressure relief valve, a pressure differential equal to the cracking pressure will result. The check or relief valve is therefore unaffected. The maximum hydrostatic pressure in this condition is also limited only by the strength of the housing into which the insert is installed.

A hydrostatic test for proof or burst pressure applied in the opposite direction (i.e. the checked direction) will stress the check or pressure relief valve.

Table I lists the proof and burst pressures for Lee inserts. These pressures are per MIL-H-5440 (H) and MIL-H-8891 (A).

TABLE I
Proof and Burst Pressures

NOMINAL SYSTEM PRESSURE	3,000 psid (21 MPa dif)	4,000 psid (28 MPa dif)	5,000 psid (34 MPa dif)	8,000 psid (55 MPa dif)
SYSTEM PEAK PRESSSURE	4,050 psid (28 MPa dif)	5,400 psid (37 MPa dif)	6,750 psid (47 MPa dif)	9,600 psid (66 MPa dif)
PROOF PRESSURE	4,500 psid (31 MPa dif)	6,000 psid (41 MPa dif)	7,500 psid (52 MPa dif)	12,000 psid (83 MPa dif)
BURST PRESSURE	7,500 psid (52 MPa dif)	10,000 psid (69 MPa dif)	12,500 psid (86 MPa dif)	16,000 psid (110 MPa dif)

Retention Pressure

Each Lee insert has a specified maximum working pressure or nominal system pressure. This is stated in the Lee Technical Hydraulic Handbook and on all inspection drawings. Table II gives the locking end minimum retention pressure for every insert. This pressure will always be sufficient to withstand full burst pressure per MIL-H-5440 (H).

TABLE II
Retention Pressures

INSERT MAXIMUM WORKING/NOMINAL SYSTEM PRESSURE	3,000 psid (21 MPa dif)	4,000 psid (28 MPa dif)	5,000 psid (34 MPa dif)	8,000 psid (55 MPa dif)
RETENTION PRESSURE	7,500 psid (52 MPa dif)	10,000 psid (69 MPa dif)	12,500 psid (86 MPa dif)	16,000 psid (110 MPa dif)

Temperature Limits

Lee insert locking ends will show no degradation in retention pressure when exposed to temperatures in the range of -65˚F (-54˚C) to 275˚F (135˚C). If the temperatures are expected to be outside this range, more information on the housing material and the overall application would have to be considered by The Lee Company. Contact your local sales office for assistance.

Installation Hole Parameters

The Lee locking end is purposely designed to perform well under adverse conditions. Therefore, if the specifications outlined in this section are not followed precisely, the locking end may still perform adequately but the margin of safety will be reduced relative to the degree to which the installation hole is out of specification. Of real concern is an installation hole with many parameters not within the specifications, or when any one parameter is grossly out of specification.

Surface Finish

The installation hole should be clean and dry. Its finish should be between 16 and 63 microinches RMS (0,4 - 1,6 micrometers) circular lay with no longitudinal scratch marks. A smoother finish may result in a reduction in retention pressure capability while rougher finishes may not permit positive sealing.

Surface Treatment

Retention pressure data for Lee components is given for installations in holes that have not had special surface treatment. Passivating stainless steel installation holes per ASTM-A-967 or AMS 2700 has no effect on the performance of Lee components. Passivation per other specifications may be acceptable, but should be verified by The Lee Company or by performance testing. For aluminum we recommend untreated installation holes, however, anodized holes per MIL-A-8625 Type II are generally acceptable. Anodizing aluminum alloy installation holes per MIL-A-8625 Type III (hard coat anodizing) is not approved as it degrades retention pressure and can cause leakage. We do not approve the use of some proprietary surface treatments which include the deposition of solid lubricants such as Teflon*, since they drastically reduce the retention ability of Lee inserts.

Installation Hole Tolerance

The installation hole diametral tolerance for 0.500" (12,70 mm) diameter inserts is 0.001" (0,025 mm); for Lubrication Jets it is 0.0025” (0,064 mm); for the 5K Lee Jet and for 0.125” diameter High Pressure Check Valves it is 0.0015” (0,038 mm). All other Lee inserts have an installation hole diametral tolerance requirement of 0.0005" (0,013 mm).

Boss Size

The amount of material surrounding the passage has an effect upon the retention performance of the insert and therefore must be taken into account. To obtain the boss diameter (D), use the known housing material yield strength and the given insert diameter (d) in conjunction with Figure 2 on page 11, and calculate D as shown in Figure 1 on page 10.

* Teflon is a registered trademark of E.I. Dupont de Nemours Co., Inc.

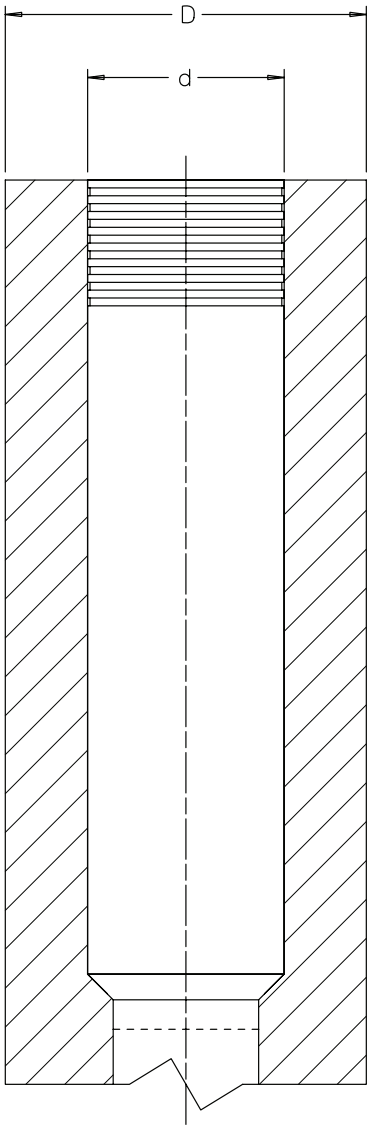


FIGURE 1
Housing Wall Thickness

Installation of Lee inserts into boss materials that have a D/d less than that recommended in Figure 2 should be substantiated by testing by the customer. During testing the expected conditions should be duplicated.

Minimum Recommended D/d Ratios
for Lee Inserts used with Dissimilar Materials

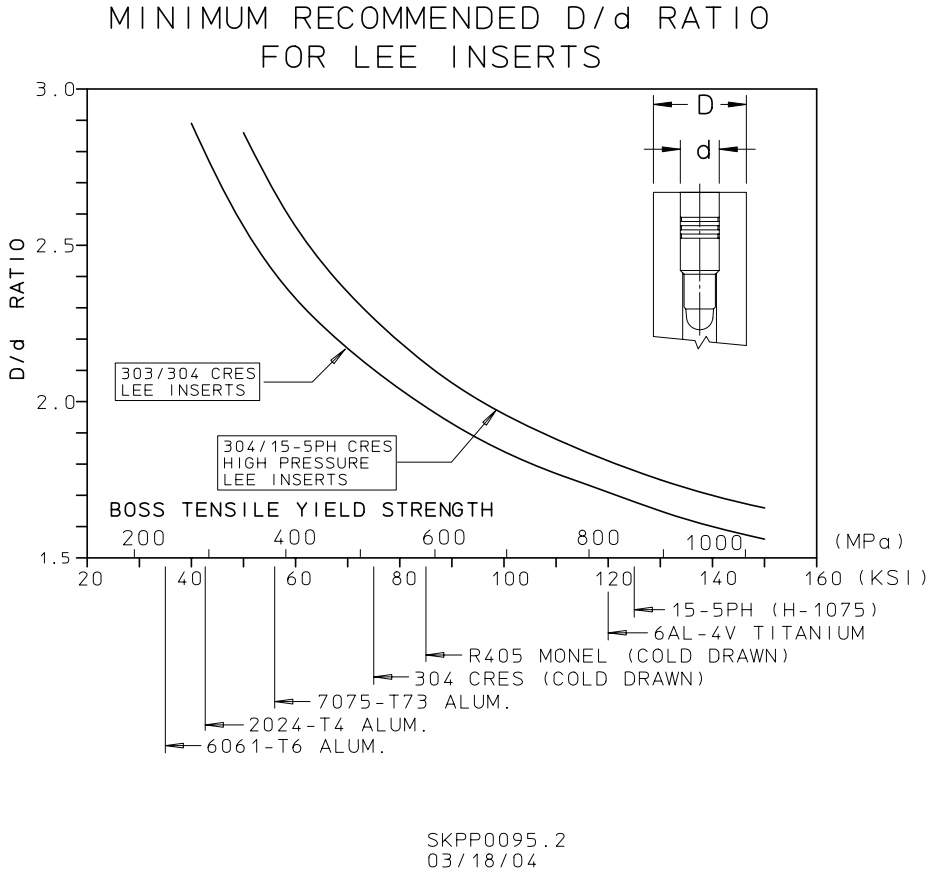


FIGURE 2
D/d for Dissimilar Material

Web Thickness

The web (the material directly below the 45 degree shoulder) should be capable of withstanding the force transmitted by driving the pin into the insert (See Figure 3 below). Generally, a minimum of 0.125" (3,2 mm) should be allowed for aluminum housings and a minimum of 0.063" (1,6 mm) for steel housings. Many inserts require significantly greater thickness due to their geometry or to protect protruding screens, which is shown on the inspection drawings for all inserts. Larger allowances should be made for weaker materials or special situations.

Support Shoulder

The support shoulder against which the insert is to be driven should be 45 degrees, otherwise the insert or nose seal may deform causing leakage. Insert movement during installation may result in low proof pressures and /or high installation forces. The minimum allowable width of the support shoulder is 0.011" (0,28 mm). This is necessary to resist the axial force transmitted while driving the pin (see Figure 3).

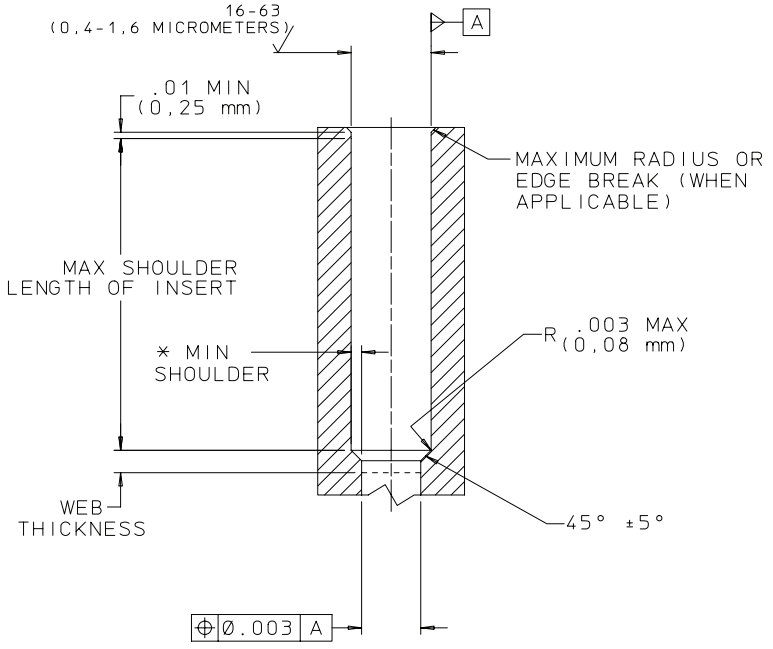


FIGURE 3
Installation Hole

Depth of Insert

The minimum depth of the installation hole should be such that the back of an insert having the maximum shoulder length will still be at least 0.010" (0,25 mm) below the surface of the boss material. This will allow the last land of the locking end to contribute to the holding capability. Some users may put a radius at the top of the installation hole as part of their machining process. If this is the case, the minimum hole depth should take this into account such that the insert is at least 0.010" (0,25 mm) below the maximum radius (See Figure 3 on Sheet 12).

Thin Walled Bosses

Lower installation forces occur when Lee Inserts are installed in thin walled bosses such as tubing, small diameter protruding bosses, or thin walled sections between adjacent passages. Low installation forces may be a sign that the boss is too thin and is deformed as a result of the expanded locking end after the pin has been installed. If this is the case, there may not have been positive sealing of the insert, and leakage or low retention pressures may result. In brittle housings, cracking may occur. Whenever possible, the D/d chart provided in Figure 2 should be used when determining wall thickness. This will help to avoid a thin wall condition.

Boss Stresses

The control of stresses at the I.D. of a Lee Insert boss is of little concern to the designer, provided that the housing material has an elongation of 3% or greater. Housings that fall into this category will not crack due to the installation of a Lee Insert. The control of boss stresses on the O.D. is important in those applications where Stress Corrosion Cracking (SCC) can be a problem. SCC is a failure caused by the combined action of a corrosive agent and a tensile stress. Although most alloys are susceptible to SCC, each material has a threshold stress value below which cracking does not occur. (The threshold value is a function of the material and the application.) Therefore, a control of boss stresses below this threshold value will eliminate SCC. (As a general rule, this value is 40% of the tensile yield strength of the boss material.)

The expansion of a Lee Insert in an installation hole causes an increase in the I.D. of the boss and thus induces a tensile tangential stress on the O.D. of the boss. The factors which influence the magnitude of the boss stresses are the amount of interference, the insert material, the boss material, and the O.D. of the boss.

When the pin is driven into the insert, the insert expands causing the I.D. of the boss to be plastically deformed. If the boss diameter (D) is relatively small compared to the insert diameter (d), the plastic region will extend to the O.D. of the boss. If the boss diameter is larger, the plastic region extends only partially through the boss and the remainder is elastically deformed.

Calculation of Boss Stresses

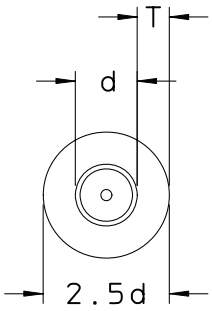
The boss stresses, both tangential tensile and the radial compressive, vary throughout the boss. The radial stress reaches a maximum at the hole I.D. and drops to zero at the O.D. of the boss. The tangential stress (assuming a plastic/elastic situation) is low at the I.D. of the boss, reaches its maximum at the plastic/elastic interface, and drops to some intermediate value at the O.D. of the boss. When a Lee insert is installed in a boss material of dissimilar mechanical properties, the stress on the O.D. of the boss will be below 40% of the tensile yield strength of the boss material by observing the D/d ratios shown in Figure 2 on page 11. In most cases, the factor limiting the boss diameter will be the retention pressure requirements and not the stresses.

Stresses in Non-Uniform Bosses

The stress situation is different for bosses having a non-uniform wall thickness. Installing inserts in this type of boss results in a stress concentration adjacent to the minimum wall thickness. This is obtained because the thicker (and therefore stiffer) section of the boss resists deformation, thus concentrating the effects of insert expansion in the thinner section of the boss. Detailed testing at The Lee Company has determined the necessary T/d ratios for some non-uniform bosses (see Figure 4 on Sheet 15).

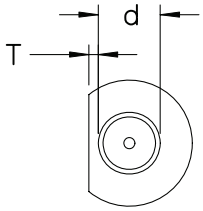
For wall thickness T and insert diameter d, the minimum recommended T/d ratios for several boss configurations are as shown in Figure 4.

Uniform - Round Boss



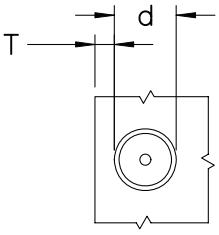
T/d = 0.65

Non-Uniform - One Flat



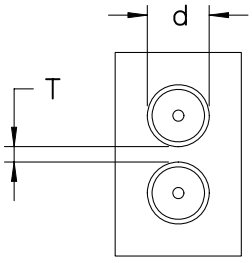
T/d = 0.95

Non-Uniform - Point Load



T/d = 1.1

Spacing Between Insert



T/d = 0.65

FIGURE 4
Non-Uniform Bosses

SECTION II - INSPECTION AND HANDLING

Lee Q.C. Procedures

The final inspection of inserts at The Lee Company is comprehensive and includes a 100% visual inspection for surface defects. All other dimensions are inspected per ANSI-ASQ Z1.4 LEVEL II.

Checking O.D.

All diametrical measurements of Lee Inserts should be made on the front or nose end of the insert to eliminate false readings due to permissible groove burrs.

Lot Control Certification

All Lee Pins and Inserts are manufactured and controlled by lots. These lot numbers are marked on the package so the insert body and pin can be traced back to the material certification from the mill. The material lot numbers and certificates of material certification are kept on file. (See example of certification in Appendix A.)

Wax Coating

Lee Insert Pins are coated with a wax that produces a thin solid lubricant film. This film has proven to reduce friction and prevent galling and seizing sufficiently to permit the pin to be driven flush with the back of the insert. The handling of pins should be kept to a minimum. In addition, Lee Insert Pins are not to be stored at temperatures exceeding 150˚F (65˚C). **Do not degrease the pins as this voids our warranty and may render the pin uninstallable.**

The Lee Company absolutely prohibits customers from rewaxing pins or using lubricants of any kind in assembling inserts and this action will also void our warranty. Although the taper angles of pins and inserts are small, the coefficient of friction can be reduced sufficiently by additional lubricants to cause properly installed pins to back out of the insert. Pin backout is a critical situation and must be avoided. Installation forces for pins are high by design.

SECTION III - Installation and Extraction of Lee Inserts

The performance of the Lee locking end is due to the independent seals and retaining rings created by the controlled expansion of the insert. Therefore, it is important that proper care is taken during installation. Of equal importance, the proper extraction procedure may allow the user to avoid the high cost of having housings reworked. Table V on Sheet 25 lists some of the common problems and probable causes. When using threaded installation or extraction tools, it is important to ensure that the pin is threaded all the way onto the tool so that the pin bottoms on the shoulder of the tool, thus avoiding thread damage.

Lee Insert Installation

Pins may be driven into the insert using an arbor press, hydraulic press, or hammer. If a hydraulic or other type of press is used, adjust the stroke by setting a mechanical stop to press the pin to the flush position. For experimental or prototype work, The Lee Company recommends using a properly sized hammer.

The following procedure should be followed for most Lee Inserts (see Figure 5 on Sheet 18). Inserts with a 0.125" (3.17mm) diameter and all Lee Biased Type Shuttle Valves are the exceptions and the procedures for these products follow.

Standard Installation

1. Firmly support the item in which the insert is to be installed.

2. Slip the insert into the hole until it is firmly seated on the support shoulder in the mounting hole. If the groove burrs cause an interference fit, then thread the appropriate body extraction tool from the tool set listed in Table IV on Sheets 22-24 into the insert and lightly press the insert until it is bottomed. Remove the extraction tool.

3. Thread the pin, larger end first, onto the appropriate pin installation tool from the tool set listed in Table IV. Press or drive the installation tool, which must be held square to the insert, until the pin is driven flush (to within ± 0.005" (0,13mm)) with the back of the insert.

Installation of 0.093 (0.23mm), 0.125 (3.17mm) and 0.156 (3.96mm) Diameter Inserts

1. Firmly support the item in which the insert is to be installed.

2. Slip the insert into the hole until it is firmly seated on the support shoulder in the mounting hole. If the groove burrs cause an interference fit, lightly press the insert against the shoulder. There are no extraction threads in the body, therefore, in order to get the insert flush it may be necessary to push lightly on the back skirt of the insert. **Care must be taken, as it is possible to overload and crush the skirt of the body.**

3. Start the pin, smaller end first, into the body. There are no extraction threads in the pin and therefore, the installation tool has only a smooth protrusion to help locate the center of the pin. With the installation tool from the appropriate tool set in Table IV on Sheets 22-24 held against the pin and square to the back of the insert, drive or press the pin until it is flush (to within ±0.005" (0,13 mm)) with the back of the insert.

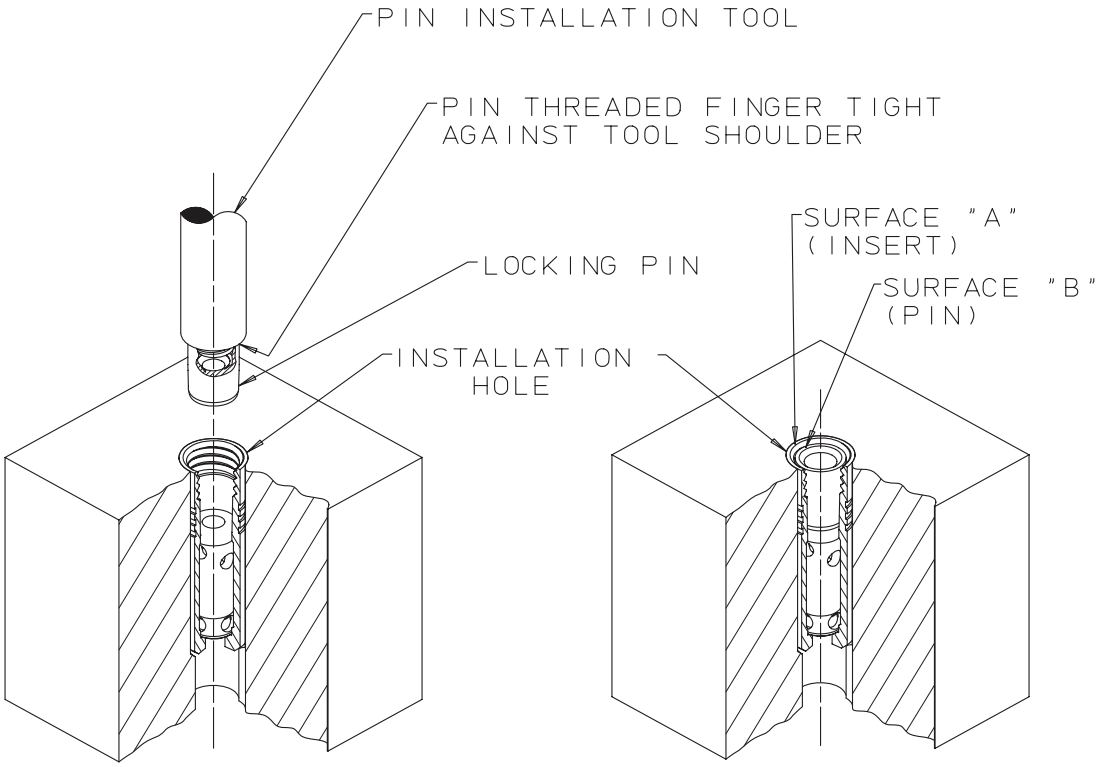


FIGURE 5
Installation of Lee Inserts

Notes:
1. Surface “A” to be .010" (0,25mm) minimum below surface of housing.
2. Surfaces “A” and “B” to be flush within ± .005" (0,13 mm).

Lee Multi-port Valves

Many Lee multi-port valves include a nose seal or compression seal that is required to isolate two ports from one another. When the valve is installed, the compression seal is forced up the taper, causing it to expand and seal on the ID of the installation hole. It is important that the seal be preset prior to the installation of the pin into the insert. Any movement of the insert during the pin installation can shear the grip that the insert had initiated thus greatly reducing the blowout pressure. The standard procedure for the installation of multi-port valves is provided in the following steps.

1. The tapered ID of the seal should already be placed over the tapered nose on the valve. The seal is installed onto the valve such that the outer dimension of the seal does not exceed the dimension found on the appropriate Lee inspection drawing.

2. Thread the insert onto the body installation tool from the appropriate tool set found on the Lee inspection drawing or in Table IV on Sheets 22–24. Gently push the insert until it is against the shoulder

3. Apply an axial force per the appropriate Lee inspection drawing. This force will expand the nose seal employing the locking end principle to provide an effective seal.

4. Thread the pin, larger end first, onto the appropriate pin installation tool from the tool set listed in the appropriate inspection drawing or Table IV on Sheets 22-24. Press or drive the installation tool, which must be held in line with the insert, until the pin is driven flush (to within $\pm$ 0.005" (0,13 mm) with the back of the insert.

Lee Shuttle Valves

1. Thread the insert onto the body installation tool from the appropriate tool set in Table IV on Sheets 22–24 or listed on the appropriate Lee Inspection Drawing. Gently push the insert until it is against the shoulder.

2. Apply axial force as provided in the notes of the appropriate Lee Inspection Drawing. The forces in Table III (below) are for Lee Standard Shuttle Valves and are provided for reference. This force will expand the nose or compression seal, employing the locking end principle to effectively seal the nose. It is typically preferred to use a press and load cell to accurately apply the pre-load.

TABLE III
Nose/Compression Seal Preloads

Insert Diameter (inches)	Seal Design	Force (lbf)	Force (N)
0.187 (4,75 mm)	Aluminum Nose Seal	200 - 250	900 - 1100
0.281 (7,14 mm)	Aluminum Nose Seal	400 - 500	1800 - 2200
0.500 (12,70 mm)	Aluminum Nose Seal	800 - 900	3600 - 4000
0.281 (7,14 mm) 0.375 (9,53 mm) 0.500 (12,70 mm)	Polymer Compression Seal	500 - 700	2200 - 3100

3. Thread the pin, larger end first, onto the appropriate pin installation tool from the tool set listed in Table IV on Sheets 22-24 or listed on the appropriate Lee Inspection Drawing. Press or drive the installation tool, which must be held squared with the insert, until the pin is driven flush (to within ± 0.005" (0,13 mm) with the back of the insert.

Dual Insert Adapters

It is possible to stack two Lee inserts of the same diameter in series with the use of the Lee Dual Insert Adapter. The adapter eliminates the need to machine an additional shoulder, which normally would be required to place a second insert behind the first. The second insert is no longer required to be a larger diameter than the first, allowing for a smaller boss. Machining is simplified and space and weight are reduced.

Dual insert adapters are available for 0.187 inch and 0.281 inch diameter Lee inserts, and are offered in two versions: one with crossport flow capability and the other without. They are not to be used in conjunction with Lee plugs.

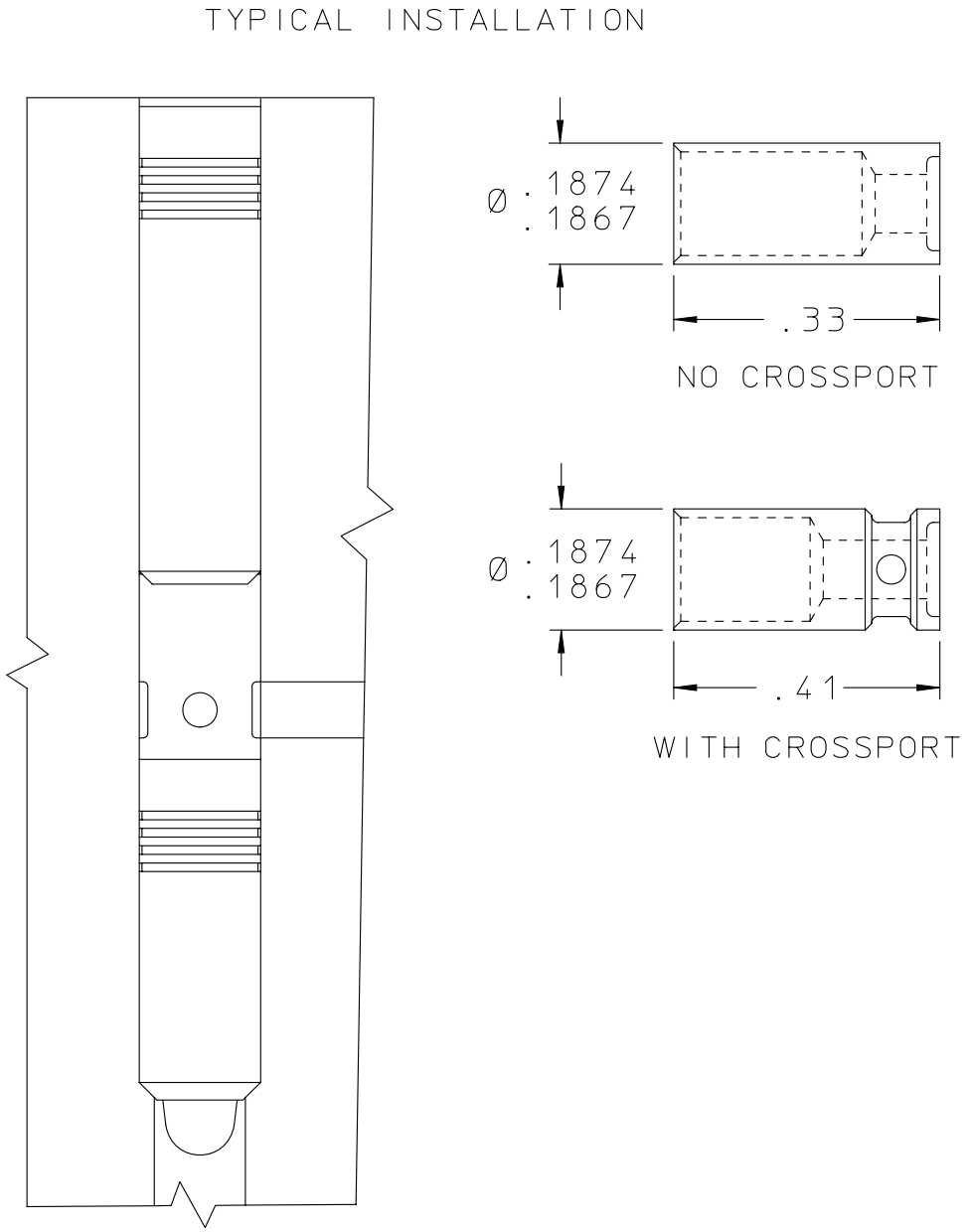


FIGURE 6
Lee Dual Insert Adapter

TABLE IV
Tool Set Part Numbers for Lee Inserts

	Installation/ Extraction Tool Sets	T-Handle Type Pin Jacking Tools	Rivet Tool Type Pin Jacking Tools
Lee Restrictors			
156 Jet	CUTA1560104C	-	-
187 Jet	CUTA1870104C	CUTA1870204B	CUTA1870404B
187 High Watt Jet	CUTA1870110C	CUTA1870204B	CUTA1870404B
187 High Watt Jet (8000 psi, 55 MPa rated)	CUTA1870210C	-	-
156 Bender Jet	CUTA1560104C		
187 Bender Jet	CUTA1870104C	CUTA1870204B	CUTA1870404B
187 Bender Jet (8000 psi, 55 MPa rated)	CUTA1870109C	-	-
250 H Bender Jet	CUTA2500406C	-	-
375 Bender Jet	CUTA3750306C	-	-
187 5K Jet	CUTA1870904C	CUTA1871604B	-
Axial Visco Jet (2502 short)	CUTA2500106C	CUTA2500206B	CUTA2500313B
Axial Visco Jet (2500 short)	CUTA2000113C	CUTA2000213B	CUTA2500706B
Axial Visco Jet (2503 long)	CUTA2500106C	CUTA2500206B	CUTA2500313B
Axial Visco Jet (2501 long)	CUTA2000113C	CUTA2000213B	CUTA2500706B
JEVA	CUTA1870104C	CUTA1870204B	CUTA1870404B
Visco Jet (18 series)	CUTA1870104C	CUTA1870204B	CUTA1870404B
125 Visco Jet (8000 psi, 55 MPa rated)	CUTA1250306C	-	-
187 Visco Jet (8000 psi, 55 MPa rated)	CUTA1870109C	-	-
Deflector Jet	CUTA1870104C	CUTA1870204B	CUTA1870404B
281 Kilowatt Jet	CUTA2810104C	-	-
Micro Jets	CUTA2711004C	-	-
Lee Flow Controls			
Restrictor Chek	CUTA1870104C	CUTA1870204B	CUTA1870404B
187 Flow Control	CUTA1870104C	CUTA1870204B	CUTA1870404B
281 Flow Control	CUTA2810114C	CUTA2810214B	-
375 Flow Control	CUTA3750106C	CUTA3750206B	-
500 Flow Control	CUTA5000106C	CUTA5000216B	-
281 Flosert	CUTA2810114C	CUTA2810214B	-
500 Flosert	CUTA5000116C	CUTA5000216B	-
500 Flosert (5000 psi, 34 MPa rated)	CUTA5000716C	-	-
187 Flow Control (5000 psi, 34 MPa rated)	CUTA1870904C	CUTA1871604B	-
281 Flow Control (5000 psi, 34 MPa rated)	CUTA2810114C	CUTA2810214B	CUTA2810314B
375 Flow Control (8000 psi, 55 MPa rated)	CUTA3750106C	CUTA3750206B	-
500 Flow Control (8000 psi, 55 MPa rated)	CUTA5000206C	CUTA5000416B	-

TABLE IV -CONTINUED
Tool Set Part Numbers for Lee Inserts

	Installation/ Extraction Tool Sets	T-Handle Type Pin Jacking Tools	Rivet Tool Type Pin Jacking Tools
Lee Nozzles			
Spin Jet	CUTA1870104C	CUTA1870204B	CUTA1870404B
187 Lubrication Jet (Screened)	CUTA1870104C	CUTA1870204B	CUTA1870404B
125 Lubrication Jet	CUTA1250801C	-	-
187 Lubrication Jet (Unscreened)	CUTA1870801C	-	-
250 Lubrication Jet	CUTA2500801C	-	-
343 Lubrication Jet	CUTA3430801C	-	-
Lee Check Valves			
187 Zero Leak Chek	CUTA1870110C	CUTA1870204B	CUTA1870404B
250 Zero Leak Chek	CUTA2500506C	CUTA2500206B	CUTA2500313B
187 Lee Chek (Axial Flow)	CUTA1870104C	CUTA1870204B	CUTA1870404B
250 Lee Chek (Axial Flow)	CUTA2500106C	CUTA2500206B	CUTA2500313B
187 Lee Chek (Side Exit)	CUTA1870306C	CUTA1870204B	CUTA1870404B
187 Lo-Lohm Chek	CUTA1870110C	CUTA1870204B	CUTA1870404B
250 Lo-Lohm Chek	CUTA2500306C	CUTA2500806B	CUTA2500606B
375 Lo-Lohm Chek	CUTA3750106C	CUTA3750206B	-
500 Lo-Lohm Chek	CUTA5000106C	CUTA5000216B	-
093 Chek	CUTA0930106C	-	-
125 Chek (8000 psi, 55 Mpa rated)	CUTA1250306C	-	-
156 Chek	CUTA1560106C	-	-
187 Chek (8000 psi, 55 Mpa rated)	CUTA1870210C	CUTA1870204B	CUTA1870404B
250 Chek (8000 psi, 55 Mpa rated)	CUTA2500406C	CUTA2500806B	CUTA2500606B
375 Chek (8000 psi 55 Mpa rated)	CUTA3750306C	CUTA3750206B	-
500 Chek (8000 psi 55 Mpa rated)	CUTA5000206C	CUTA5000416B	-
500 Hi-Q Chek	CUTA5000306C	CUTA5000216B	-
250 Pilot Operated Chek	CUTX0503050B	CUTA2500806B	CUTA2500606B

TABLE IV -CONTINUED
Tool Set Part Numbers for Lee Inserts

	Installation/ Extraction Tool Sets	T-Handle Type Pin Jacking Tools	Rivet Tool Type Pin Jacking Tools
Lee Relief Valves			
187 PRI	CUTA1870104C	CUTA1870204B	CUTA1870404B
281 PRI	CUTA2810114C	CUTA2810214B	-
375 PRI (Forward)	CUTA3750106C	CUTA3750206B	-
375 PRI (Reverse)	CUTA3750214C	CUTA3750206B	-
500 PRI (Forward)	CUTA5000106C	CUTA5000216B	-
500 PRI (Reverse)	CUTA5000116C	CUTA5000216B	-
Hi-Lohm PRI	CUTA2810114C	-	-
187 TRI	CUTA1870104C	CUTA1870204B	CUTA1870404B
250 PRI (8000 psi, 55 Mpa rated)	CUTA2500406C	-	-
281 PRI (8000 psi, 55 Mpa rated)	CUTA2810114C	-	-
375 PRI (8000 psi, 55 Mpa rated	CUTA3750514C	-	-
187 TRI (8000 psi, 55 Mpa rated)	CUTA1870210C	-	-
250 TRI (8000 psi, 55 Mpa rated)	CUTA2500406C	-	-
281 Zero Leak PRI	CUTA2810114C	-	-
Lee Shuttle Valves			
187 Shuttle Valve	CUTA1870137C	CUTA1870204B	CUTA1870404B
281 Shuttle Valve	CUTA2810137C	CUTA2810214B	-
500 Shuttle Valve	CUTA5000137C	CUTA5000216B	-
187 Shuttle Valve (5000 psi, 34 Mpa rated)	CUTA1870137C	CUTA1870204B	CUTA1870404B
281 Shuttle Valve (5000 psi, 34 Mpa rated)	CUTA2810137C	CUTA2810214B	-
500 Shuttle Valve (5000 psi, 34 Mpa rated)	CUTA5000237C	CUTA5000416B	-
281 Detented Shuttle Valve	CUTA2810114C	CUTA2810214B	-
500 Detented Shuttle Valve	CUTA5000337C	CUTA5000516B	-
187 Selective Shuttle Valve	CUTA1870104C	CUTA1870204B	-
250 Selective Shuttle Valve	CUTX0503050B	CUTA2500806B	CUTA2500606B
500 Selective Shuttle Valve	CUTA5000337C	CUTA5000516B	-
500 Inverse Shuttle Valve	CUTA5000206C	CUTA5000416B	-
Lee Safety Screens			
Safety Screen (Insert Retained)	CUTA1870128C	CUTA1870204B	CUTA1870404B

TABLE V

Trouble Shooting Guide

Problem	Probable Cause
High Installation Forces	Hole is out of round.
Pin Deformation	Pin is inserted upside down.
	Pin mushroomed due to too many light taps.
	Insufficient or incorrect support shoulder.
	No wax on pin.
Low Installation Forces	Oversize or tapered hole.
	Wall section is too thin.
	Use of high film strength lubricant.
	Hole out of round.
Leakage and/or Low Retention Pressure	Oversize or tapered hole.
	Longitudinal scratch marks in installation hole.
	Installation hole too smooth (smoother than 16 microinches RMS (0,4 micrometers).
	Wall section is too thin.
	Insert not bottomed on support shoulder.
	Boss material is much harder than insert material.
	Improper surface treatment on installation hole.
	Thermally mismatched insert and boss material in large temperature variation application.
	Use of a lubricant on the installation hole.
Pin Backout	Use of a high film lubricant on the pin.
	Oversized installation hole.
	Flat Bottom support shoulder.

LEE INSERT EXTRACTION

It is sometimes necessary to remove inserts. The following procedures may permit removal of Lee Inserts without requiring rework of the boss or contamination of the passage.

Pin Extraction

There are three methods to remove a Lee Insert Pin. The preferred methods use pin jacking tools, where the extraction forces react against the rear of the insert. The two types of pin jacking tools available are the Rivet Tool and the T-Handle. At times the bolt and striker method may remove the insert with the pin. This tends to severely gall the installation hole. The pin jacking tools will prevent the body from being extracted with the pin and therefore leave the installation hole in better condition to receive another insert. Pin jacking tools are not available for all Lee inserts.

Pin Extraction - Rivet Tool (See Figure 7 on Sheet 27)

1. Thread the appropriate stud from the tool set listed in Table IV on Sheets 22 - 24 into the pin to be removed.

2. Slide the sleeve down over the stud until it is seated against the end of the body.

3. Engage the grooved end of the stud into rivet tool, allowing some space between the tool end of the sleeve. Squeeze the handle until the pin is free.

Pin Extraction – T-Handle (See Figure 8 on Sheet 28)

1. Select the appropriate T-Handle pin jacking tool from Table IV on Sheets 22 – 24.

2. Run the drive nut up the drive shaft until the extractor stud threads are clear of the extractor guide sleeve.

3. Hold the T-Handle to prevent the stud from turning, and run the wrenching nut down the drive shaft thread until the face of the extractor guide sleeve bears against the exposed face of the insert body.

4. While grasping the T-Handle, use an open-end wrench to turn the drive nut in a counter-clockwise direction.

5. Diminished drive nut wrenching force indicates that the pin is free.

Pin Extraction - Bolt and Striker (See Figure 10 on page 31)

1. Use the extraction tools from the appropriate tool set listed in Table IV on Sheets 22 - 24.

2. Slide the striker onto the pin extraction tool and thread it completely into the pin.

3. Strike the head of the pin extraction tool with the striker until the pin is removed.

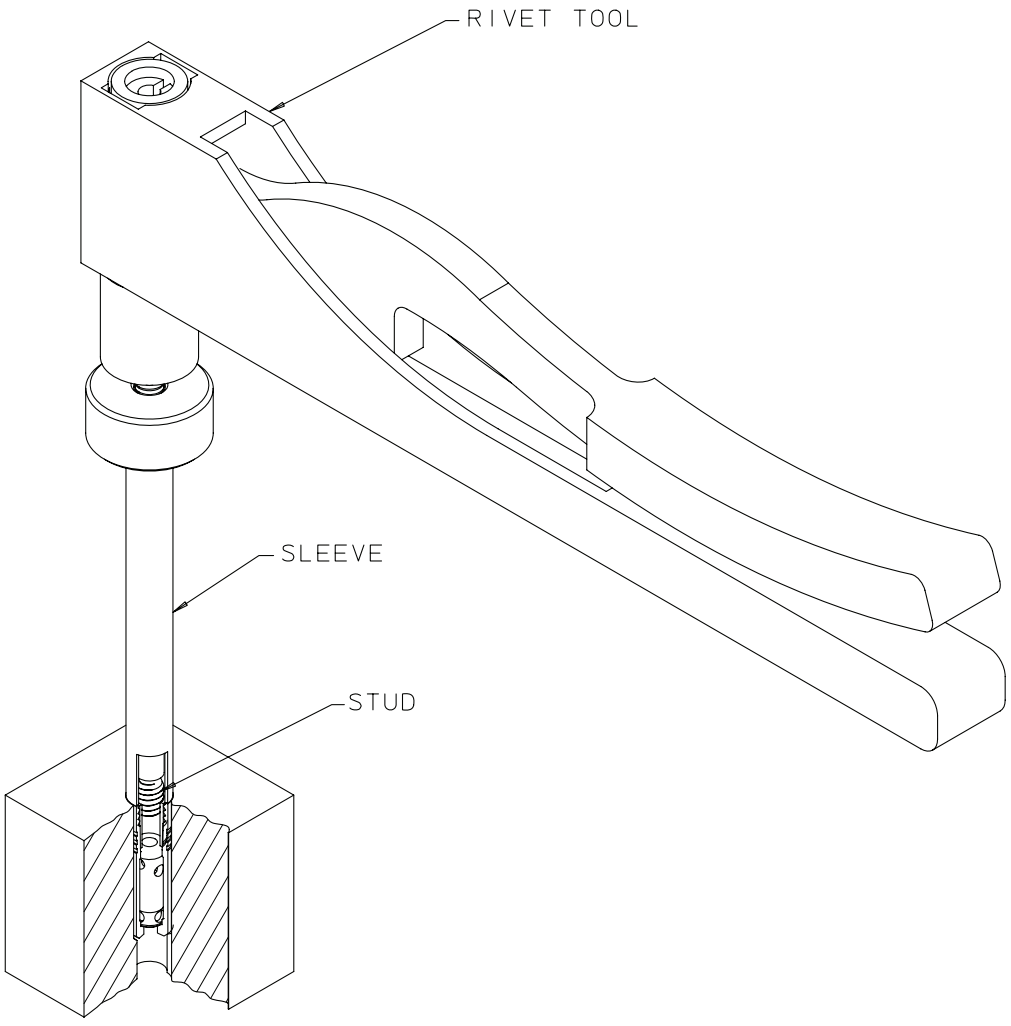


FIGURE 7
Rivet Type Pin Jacking Tool

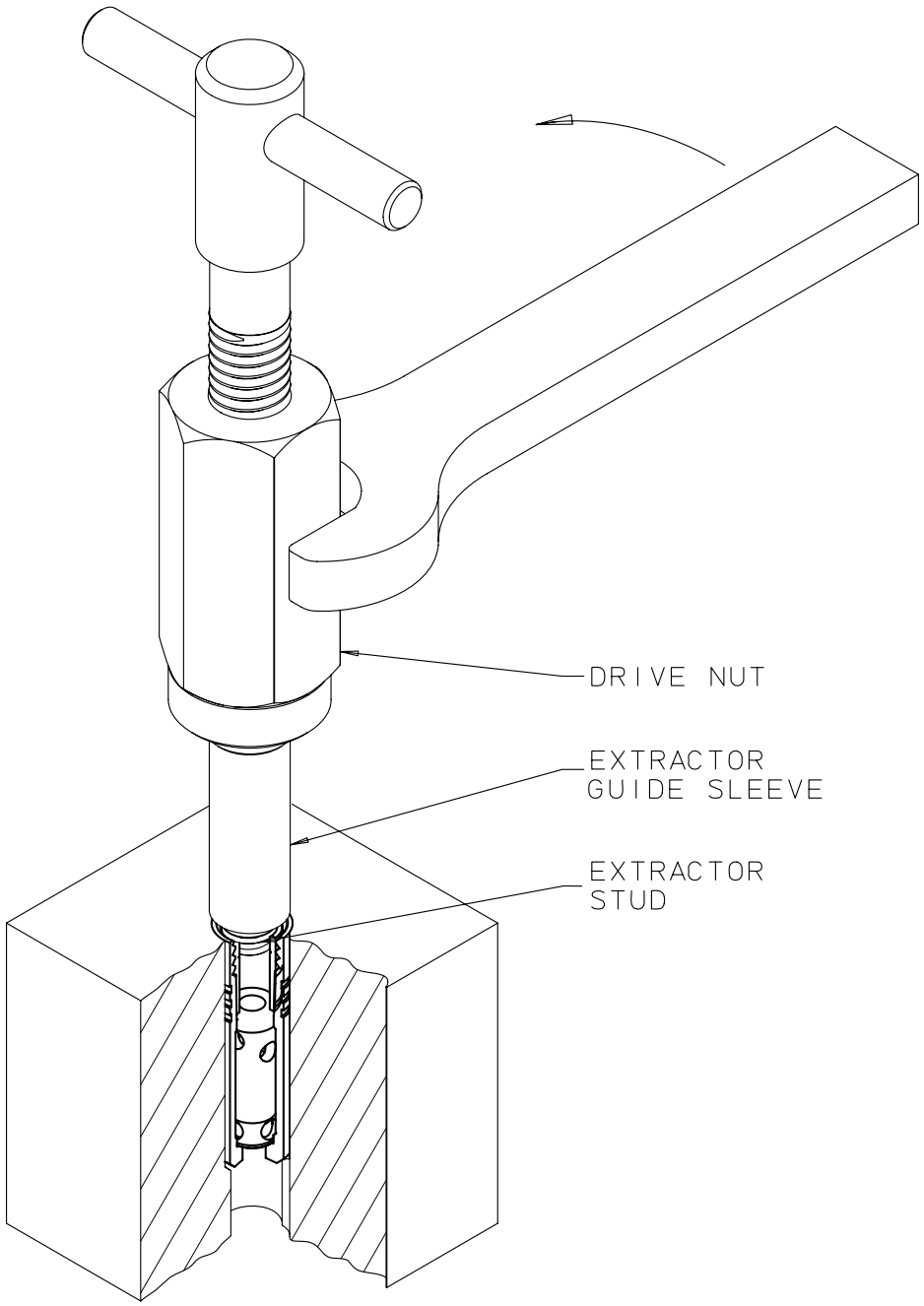


FIGURE 8
T-Handle Type Pin Jacking Tool

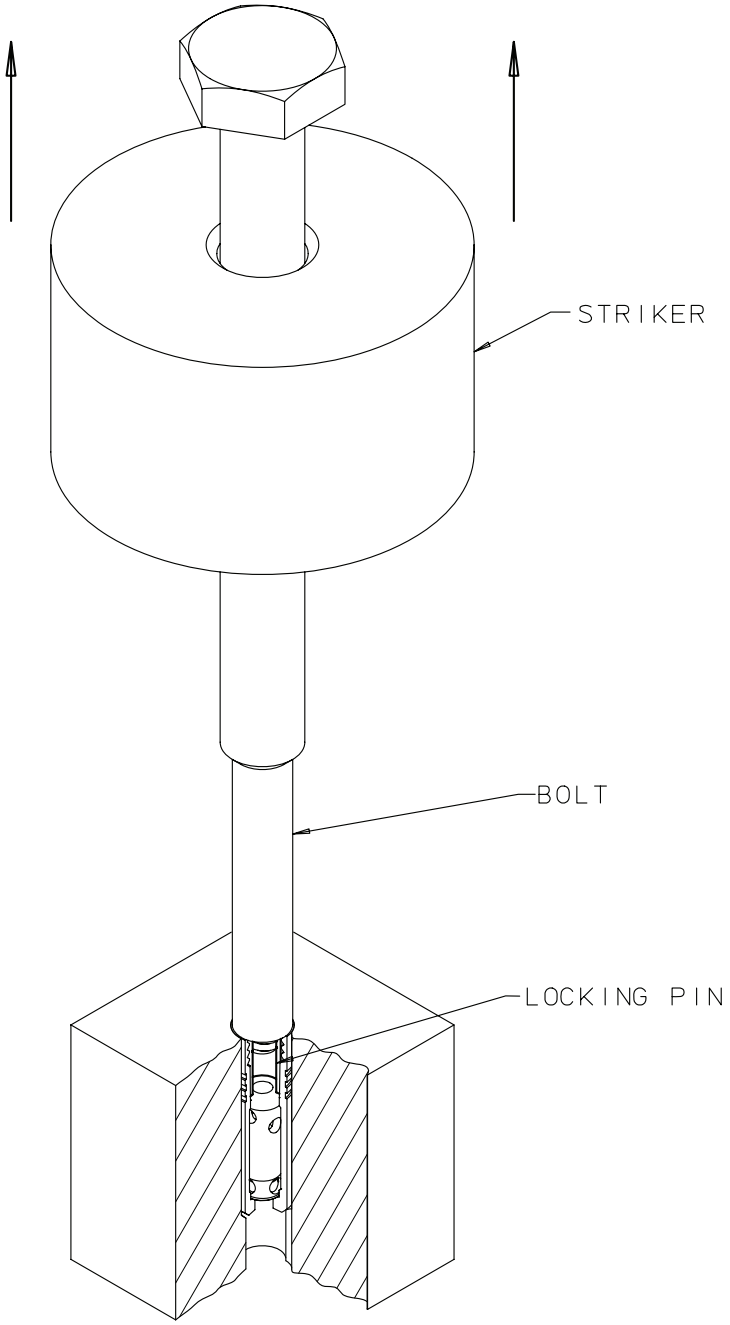


FIGURE 9
Pin Extraction Using Bolt and Striker

Insert Extraction

All Lee Inserts are readily removed with a bolt and striker. Some smaller diameter Lee Inserts do not have extraction threads and therefore threads must be tapped prior to extraction. The Shuttle Valves require a special tool to remove the nose/compression seal.

Extraction Method - (See Figure 10 on Sheet 31)

1. Use the extraction tools from the appropriate tool set listed in Table IV on Sheets 22–24.

2. Slide the striker onto the body extraction tool and thread the tool completely into the body.

3. Strike the head of the body extraction tool with the striker until the body is removed.

4. **Lee Shuttle Valves Only.**

   4a. Having already extracted the insert, thread the nose/compression seal extraction tool assembly such that the sleeve is not expanded by the end of the body and the threads are still engaged.

   4b. Slide the striker onto the tool.

   4c. Insert the tool into the installation hole until the head of the sleeve is through and beyond the nose/compression seal. Thread the tool assembly together expanding the end of the tool sleeve. (See Figure 11 on Sheet 32)

   4d. Lightly tap the nose seal from the hole with the striker.

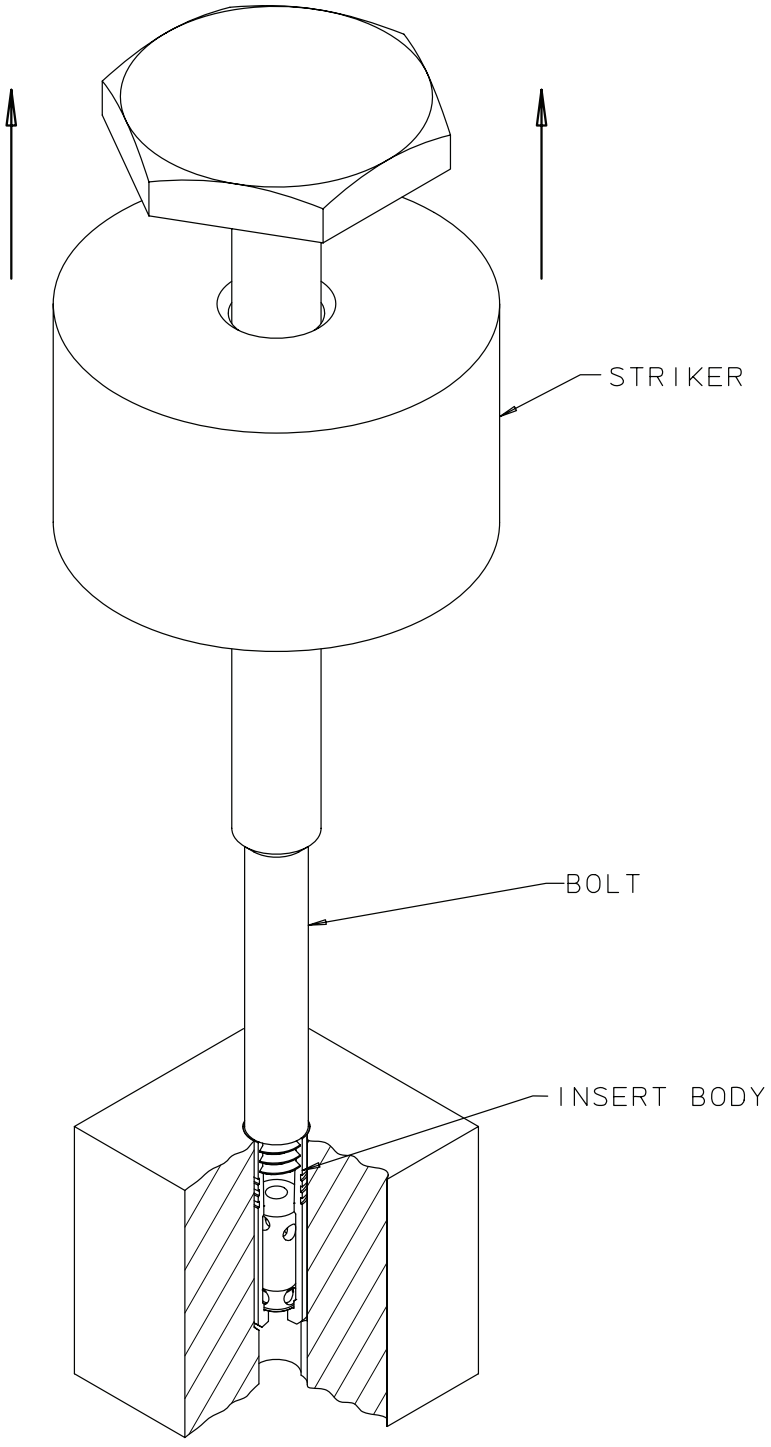


FIGURE 10
Extraction of Lee Insert

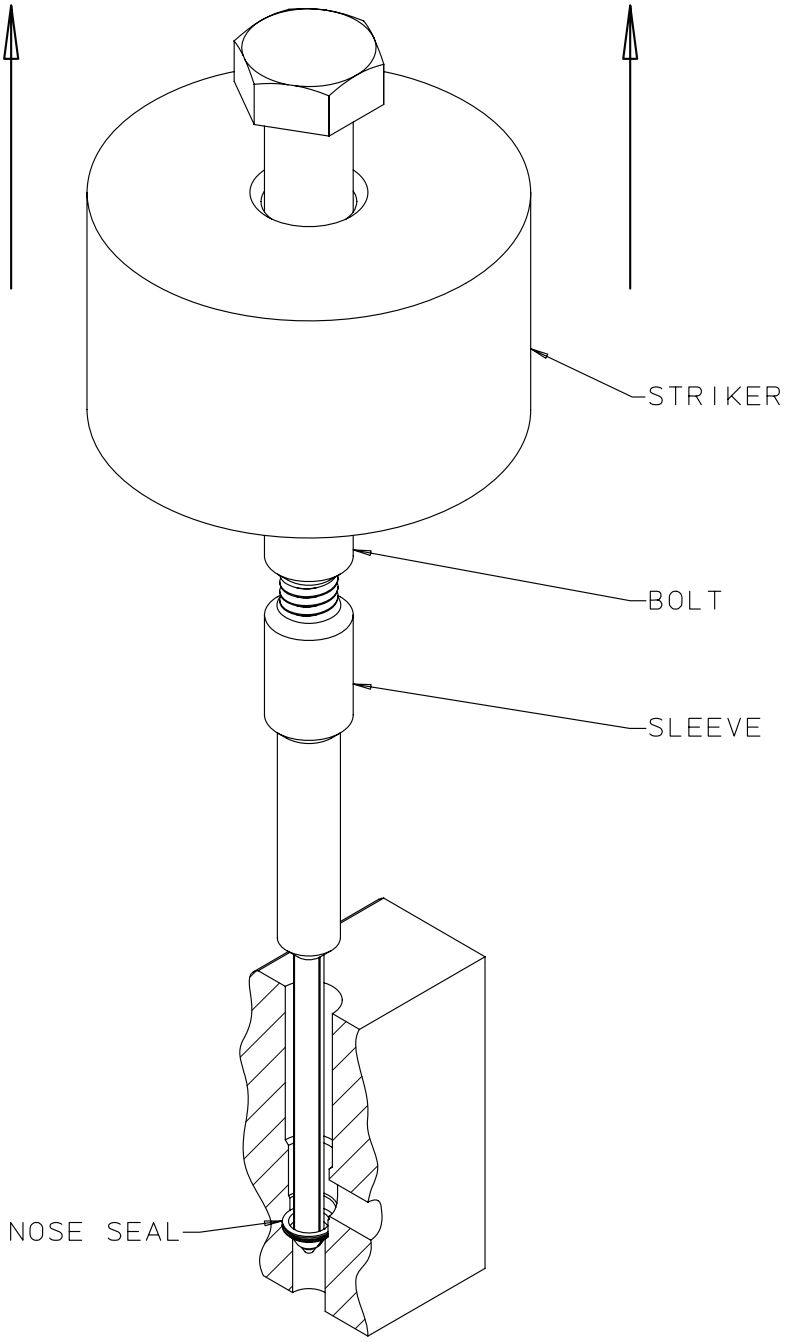


FIGURE 11
Nose/Compression Seal Extraction Tool

CONCLUSION

Adherence to the guidelines and procedures presented in this document will result in insert installations that are highly reliable, strong, and leak-free. Due to the multitude of environments and conditions to which the Lee Inserts may be exposed, retention testing by Lee Insert users is an essential part of the Lee Insert installation process. Retention pressure testing should be conducted by flow testing restrictors and reverse flow valves in the reverse direction at the maximum transient pressure listed in Table I. Forward flowing valves should be retention pressure tested by hydrostatically pressurizing the valve to the retention pressure listed in Table II. This testing serves to verify the integrity of the unit and indicates any inserts which may have been improperly installed. Installations must be fully shielded during testing in case an improperly installed insert should fail.

For any additional help or information, please feel free to contact a Lee Sales Engineer at any of the locations listed on the next few pages.

Lee Company U. S. Sales Offices

THE LEE COMPANY
Technical Center
P. O. Box 424, 2 Pettipaug Road
Westbrook, CT 06498-0424

Tel: (860) 399- 6281
(800) 533-7584 (LEE PLUG)
Fax: (860) 399-7058 Order Entry
(860) 399-7037 Technical Information
(860) 399-2270 Advertising
Web: **www.theleeco.com**
E-mail: ct-sales@theleeco.com

THE LEE COMPANY
1511 N. Westshore Blvd.
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fl-sales@theleeco.com

THE LEE COMPANY
8600 W. Bryn Mawr Ave.
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il-sales@theleeco.com

THE LEE COMPANY
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Tel: (714) 899-2177
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ca-sales@theleeco.com

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Tel: (248) 827-0981
Fax: (248) 827-2144
mi-sales@theleeco.com

THE LEE COMPANY
1250 Bayhill Drive
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Tel: (650) 238-2045
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ca-sales@theleeco.com

THE LEE COMPANY
545 E. John Carpenter Fwy.
Suite 875
Irving, TX 75062

Tel: (972) 791-1010
Fax: (972) 791-1717
tx-sales@theleeco.com

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Subsidiary for the United Kingdom and Ireland **LEE PRODUCTS LIMITED (LPL)** 3 High Street, Chalfont St. Peter, Gerrards Cross Buckinghamshire SL9 9QE ENGLAND Tel: + 44 1 753-886664 Fax: + 44 1 753-889588 sales@leeproducts.co.uk	*Subsidiary for Denmark, Sweden, Norway, Finland and Russia* **THE LEE COMPANY SCANDINAVIA AB** Pajalagatan 56 SE-162 65 Vällingby SWEDEN Tel: + 46 8 579 701 70 Fax: + 46 8 875252 sales@theleeco.se Helsinki, Finland Tel: + 358 44 0111 246 Fax: + 358 19 331 890 marko.koskinen@theleeco.net
Subsidiary for Germany, Austria, Eastern Europe and German speaking Switzerland **LEE HYDRAULISCHE MINIATURKOMPONENTEN, GmbH (LPD)** Am Limespark 2 65843 Sulzbach / Taunus Germany Tel: + 49 6196-77369-0 Fax: + 49 6196-77369-69 info@lee.de Bonn Office: Tel: + 49 22 44 871263 Fax: + 49 22 44 871264	*Agent for South America* **TRUSTY COMÉRCIO E REPRESENTAÇÕES LTDA.** Av. J.K. de Oliveira 580 Sala: 41, Guaratinguetá, Sáo Paulo, 12505-300 BRAZIL Tel: + 55 12 3132-3418 Fax: + 55 12 3132-3560 rui@tcr-brazil.com.br
Subsidiary for France, Spain and French speaking Switzerland **LEE COMPANY S.A. (LPF)** 44 rue Jean Bart 78960 Voisins-le-Bretonneux FRANCE Tel: +33 1 30 64 99 44 Fax: +33 1 30 64 91 26 info@leecompany.fr Toulouse Office: Tel: +33 5 67 31 00 92 Fax: +33 5 34 60 50 40 h.reberga@leecompany.fr Madrid Office: SPAIN & PORTUGAL Tel: +34 913 010 572 p.sanchez.martin@leecompany.fr	*Distributor for Australia and New Zealand* **CGB PRECISION PRODUCTS PTY LTD** Unit 9, 32 Silkwood Rise Carrum Downs VIC 3201 AUSTRALIA Tel: + 61 3 9775 1125 Fax: + 61 3 9770 8844 info@cgb.com.au
Subsidiary for Italy & Italian speaking Switzerland **LEE SRL. (LPI)** Via Rondoni, 1 20146 Milano ITALY Tel: + 39 02 43981750 Fax: + 39 02 461050 sales@leesrl.it	*Distributor for Belgium, Netherlands & Luxemburg* **DENIS DE PLOEG BV** Geneindestraat 33 6301 HC Valkenburg (L) NETHERLANDS Tel: + 31 43 820 0250 Fax: + 31 43 820 0251 bs.deploeg@ddp.nl

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Agent for India **HIND INDUSTRIAL AND MERCANTILE CORP. PVT. LTD.** 22, Neo Corporate Plaza, Ramchandra Lane - Ext. Kachpada, Malad-West, Mumbai 400 064 INDIA Tel: + 91 22 2809 2447 Fax: + 91 22 2866 1964 info@hindco.net	*Distributor for Taiwan* **LOOP LINK ENTERPRISE, INC.** 6F-7, No. 171, Sec. 5 Ming Shen E. Road Taipei, TAIWAN 10589 REPUBLIC OF CHINA Tel: + 886 2 2762 9614 Fax: + 886 2 2761 3407 looplink@ms9.hinet.net
Distributor for Japan **JUPITOR CORPORATION** 3-17-4 Minami Aoyama Minato-Ku, Tokyo 107-0062 JAPAN Tel: + 81 33 403 1313 Fax: + 81 33 403 1319 t_suzuyama@jupitor.co.jp	*Distributor for Korea* **MIN SUNG GC CORPORATION** Minsung Building, Jegi-Dong 89 Yangnyeongjungang – Ro, Dongdaemun – gu, Seoul, KOREA Tel: + 822 961 7833 Fax: + 822 961 6249 minsung@minsunggc.com
Distributor for People's Republic of China and Hong Kong **EBS FLOW CONTROL LTD.** Suite 2503, Block B Lead International Building No. 2 Zhong Huan Nan Lu Jia Wang Jing, Chaoyang District Beijing 100102 CHINA Tel: + 86 10 84721177 Fax: + 86 10 84721263 info@ebshk.com.cn	

APPENDIX A

Sample Certificate of Conformance

THE LEE COMPANY
P.O. BOX 424
2 Pettipaug Road
Westbrook, CT 06498
(860) 399-6281

Date:

This is to certify that the dimensional, functional requirements, special surface treatments, and all blueprint notes of The Lee Company drawings have been inspected and are in conformance to all applicable specification requirements.

We further certify that physical and chemical test reports demonstrating conformance to applicable specifications of the material used in the manufacturing of these units, listed below, shipped to you on your order # _____ are on file at The Lee Company and are available for your review.

Lee Co. P/N: Customer P/N: Item:

Signed: _____
Quality Control Manager
THE LEE COMPANY

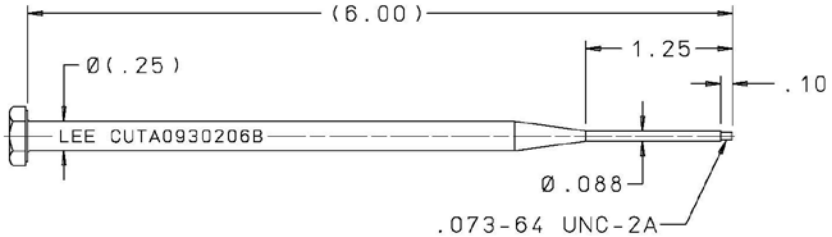
Lee Form No. 195

APPENDIX B

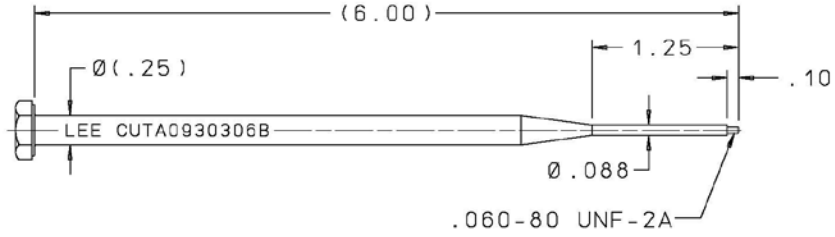
Tool Drawings (In alphanumerical order)

CUTA0930106C

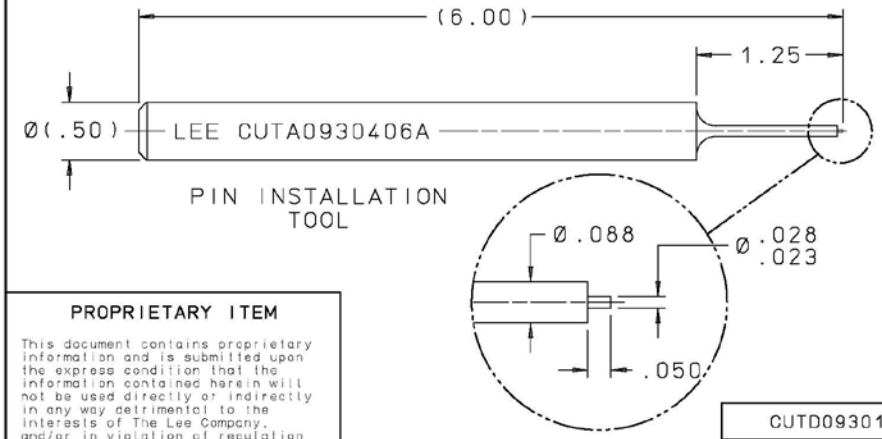
REV	DATE	BY	DESCRIPTION
A	10-26-07	KD	INITIAL RELEASE
2	12-10-07	KD	DRAFTING ERROR, PART # CUTA0930106C WAS CUTA930106C.
3	07-21-10	KD	PIN INSTAL TOOL: Ø(.50) WAS Ø.50. STRIKER: Ø(1.50) WAS Ø1.50 & (1.25) WAS 1.25.



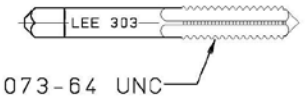
BODY EXTRACTION TOOL



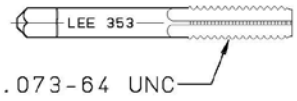
PIN EXTRACTION TOOL



PIN INSTALLATION TOOL

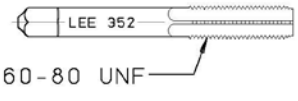


STARTER TAP PLUG EXTRACTION (CUTA3035503B)



BOTTOMING TAP PLUG EXTRACTION (CUTA3535503B)

STARTER TAP PIN EXTRACTION (CUTA3024403B)



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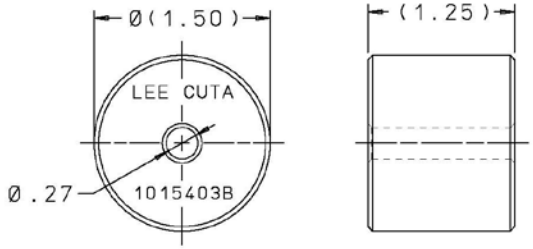


STRIKER

PROPRIETARY ITEM

This document contains proprietary information and is submitted upon the express condition that the information contained herein will not be used directly or indirectly in any way detrimental to the interests of The Lee Company, and/or in violation of regulation DAR 7-104.9(a)(1 July 1974), et seq.

CUTD0930106
REFERENCE

DWG NO. CUTA0930106C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY. ALL MANUFACTURING RIGHTS RESERVED.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 | 3 PLACES ±.005 | ANGLES ±5°

DRAWN BY:	K D	10-26-07
CHK'D BY:	DEP	11-05-07
APP'D BY:	B B	11-19-07
MAT:		
H.T.:		
FINISH:		

LEE TOOL SET, INST/EXTR
CHEK, .093

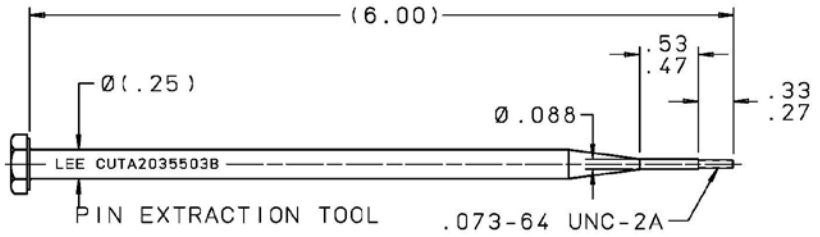
THE LEE COMPANY
WESTBROOK, CT 06498

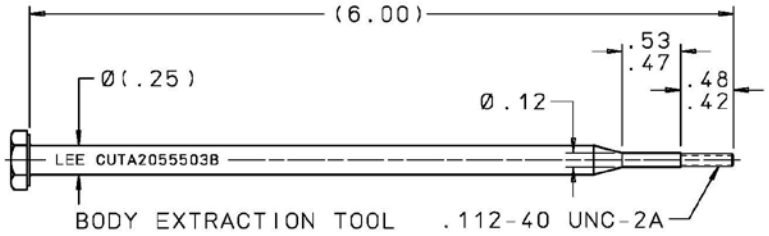
SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA0930106C	A

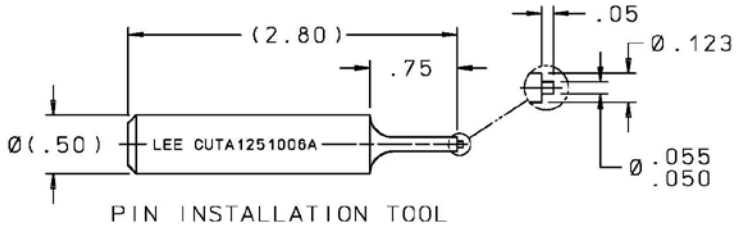
DWG SCALE: NONE | SHEET 1 OF 1

CUTA1250306C

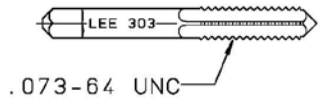
REV	DATE	BY	DESCRIPTION
A	08-09-90	GMR	INITIAL RELEASE
5	07-21-10	KD	PIN EXT TOOL: ADDED .53-.47 & .33-.27. Ø.088 WAS Ø(.088). BODY EXT TOOL:ADDED .53-.47 & .48-.42. Ø.12 WAS Ø(.12) PIN INST TOOL:(2.80) WAS 2.80, Ø(.50) WAS Ø.50. ADDED .05 & Ø.055-.050. STRIKER: (1.25) WAS 1.25 & Ø(1.50) WAS Ø1.49.



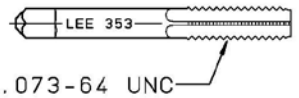




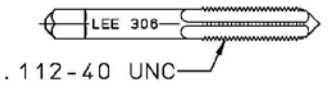
TAP DRILL
(CUTA1251206B)



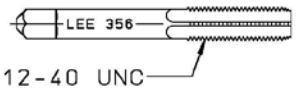
STARTER TAP
PIN EXTRACTION
(CUTA3035503B)



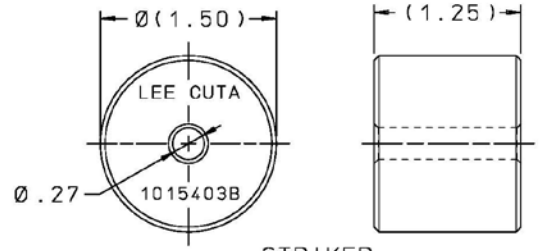
BOTTOMING TAP
PIN EXTRACTION
(CUTA3535503B)



STARTER TAP
BODY EXTRACTION
(CUTA3064403B)



BOTTOMING TAP
BODY EXTRACTION
(CUTA3564403B)



STRIKER

PROPRIETARY ITEM

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CUTD0406410

REFERENCE

DWG NO: CUTA1250306C

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EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 | 3 PLACES ±.005 | ANGLES ±5°

DRAWN BY:	GMR	08-09-90
CHKD BY:	P C	08-20-90
APPD BY:	JCD	08-22-90
MAT:		
H.T.:		
FINISH:		

LEE TOOL SET. INST/EXTR
.125 HIGH PRESSURE CHEK

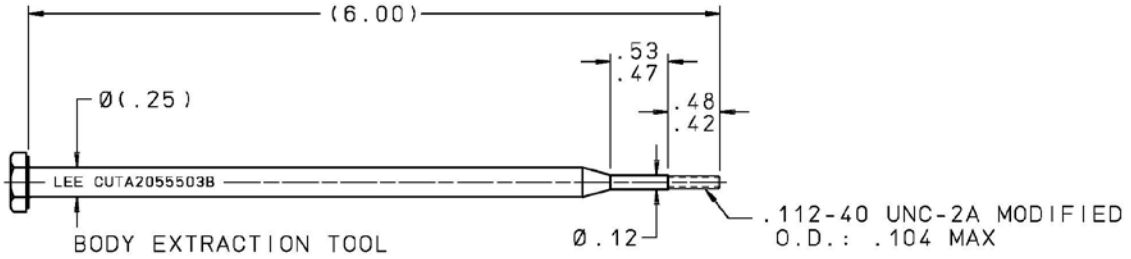
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA1250306C	A

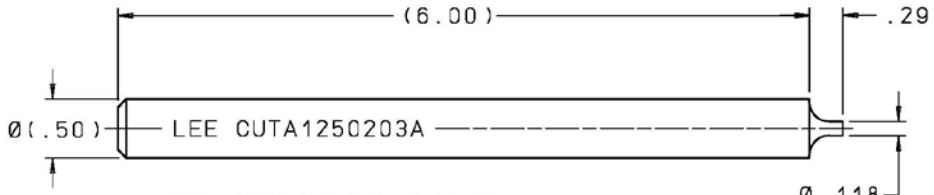
DWG SCALE: NONE | SHEET 1 OF 1

CUTA1250801C

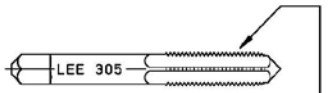
REV	DATE	BY	DESCRIPTION
A	11-01-95	BR	INITIAL RELEASE
B	05-10-06	HM	STARTER TAP WAS LEE 304. BOTTOMING TAP WAS LEE 354.BODY EXT TOOL WAS CUTA2044403B. ADDED NOTE1. REMOVED REV LETTER FROM MARKING ON STRIKER.
2	07-22-10	KD	BODY EXT TOOL: Ø.12 WAS Ø(.12), .53-.47 WAS .50 & .48-.42 WAS .45, PIN INST TOOL: .29 WAS (.29). STRIKER: (1.25) WAS 1.25 & Ø(1.50) WAS Ø1.50.



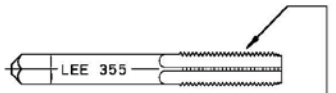
BODY EXTRACTION TOOL



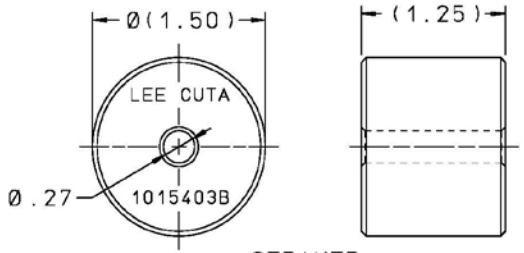
PIN INSTALLATION TOOL



STARTER TAP
BODY EXTRACTION
(CUTA3055503B)



BOTTOMING TAP
BODY EXTRACTION
(CUTA3555503B)



STRIKER

INSTALLATION/EXTRACTION TOOL SET FOR:
.125-.135 LEE JELA

NOTES:
1. DRILL OUT PIN USING #43 DRILL.
EXTRACT BODY PER PS 203.'

PROPRIETARY ITEM

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CUTD01056500
REFERENCE

DWG NO: CUTA1250801C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY. ALL MANUFACTURING RIGHTS RESERVED.
EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:
SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES
TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	B R	11-01-95
CHK'D BY:	L B	11-03-95
APP'D BY:	B B	11-07-95
MAT:		
H.T.:		
FINISH:		

LEE INSTALLATION/EXTRACTION TOOL SET

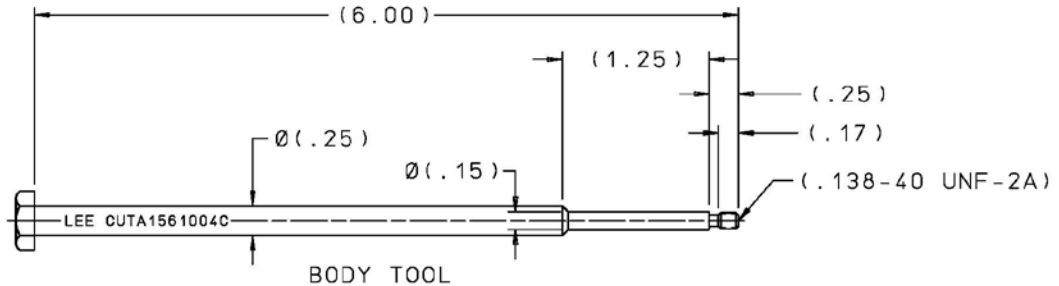
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA1250801C	B

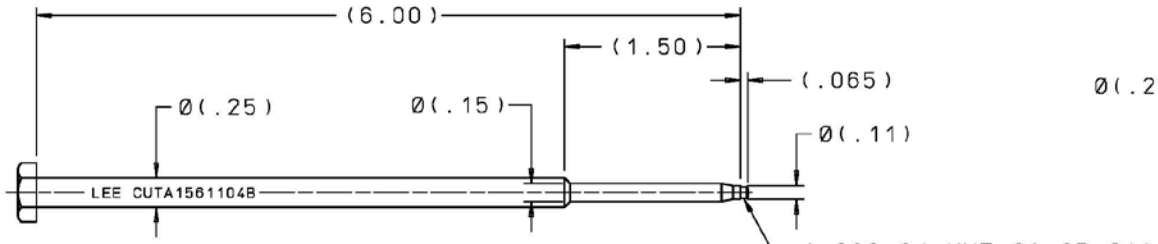
DWG SCALE: NONE SHEET 1 OF 1

CUTA1560104C

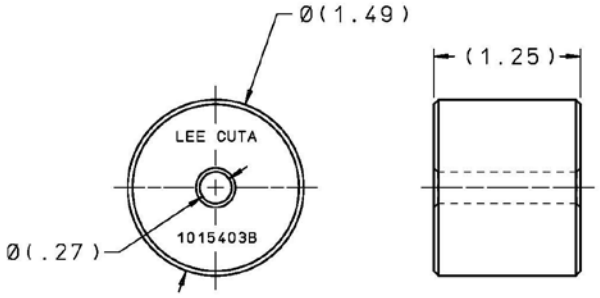
REV	DATE	BY	DESCRIPTION
A	04-01-05	KD	INITIAL RELEASE



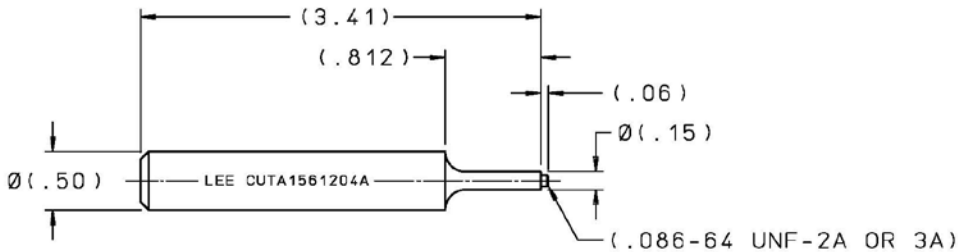
BODY TOOL



PIN EXTRACTION TOOL



STRIKER



PIN INSTALLATION TOOL

INSTALLATION AND EXTRACTION SET FOR:
.156-.166 LEE JET

PROPRIETARY ITEM

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CUTD0407470
REFERENCE

DWG NO: CUTA1560104C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:
SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES
TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	K D	04-01-05
CHKD BY:	DEP	04-05-05
APPD BY:	B B	05-05-05
MAT:		
H.T.:		
FINISH:		

LEE TOOL SET
INSTALLATION AND EXTRACTION

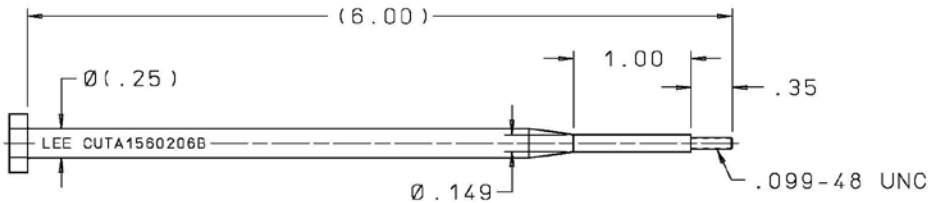
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA1560104C	A

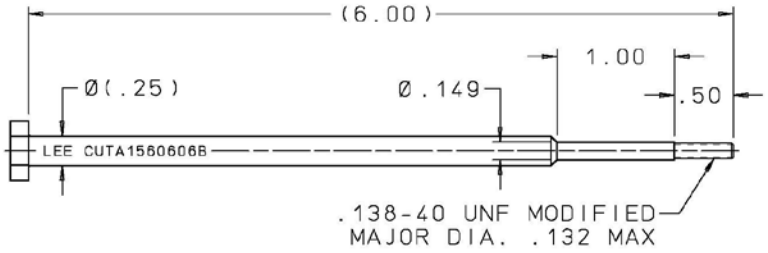
DWG SCALE: NONE | SHEET 1 OF 1

CUTA1560106C

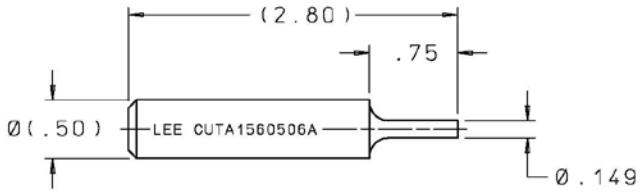
REV	DATE	BY	DESCRIPTION
A	07-02-03	HM	INITIAL RELEASE
B	08-08-03	HM	REDESIGNED TOOL SET.
C	07-23-10	KD	PIN & BODY EXTR TOOL REMOVED HEX. ADDED 2 FLATS. Ø.149 WAS Ø(.15).PIN INST TOOL REMOVED HEX. ADDED 2 FLATS. Ø(.50) WAS Ø.50. STRIKER: Ø(1.50) WAS Ø1.50 & (1.25) WAS 1.25.



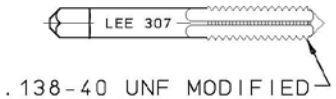
PIN EXTRACTION TOOL



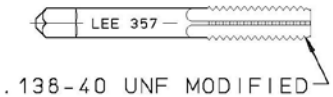
BODY EXTRACTION TOOL



PIN INSTALLATION TOOL



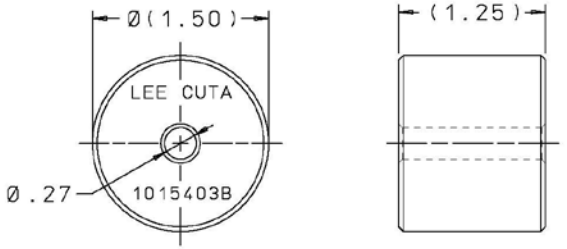
STARTER TAP
PLUG EXTRACTION
(CUTA3075503B)



BOTTOMING TAP
PLUG EXTRACTION
(CUTA3575503B)

STARTER TAP
PIN EXTRACTION
(CUTA1560306B)

BOTTOMING TAP
PIN EXTRACTION
(CUTA1560406B)



STRIKER

PROPRIETARY ITEM

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CUTD1560106
REFERENCE

DWG NO: CUTA1560106C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 | 3 PLACES ±.005 | ANGLES ±5°

DRAWN BY:	H M	07-02-03
CHK'D BY:	L B	07-09-03
APPD BY:	B B	07-11-03
MAT:		
H.T.:		
FINISH:		

LEE TOOL SET, INSTALLATION AND EXTRACTION, .156 CHEK

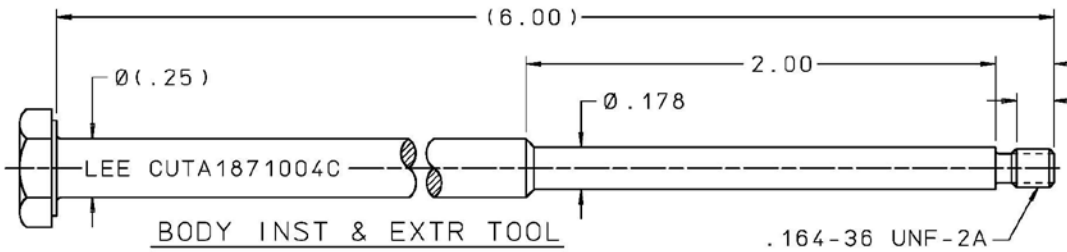
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA1560106C	C

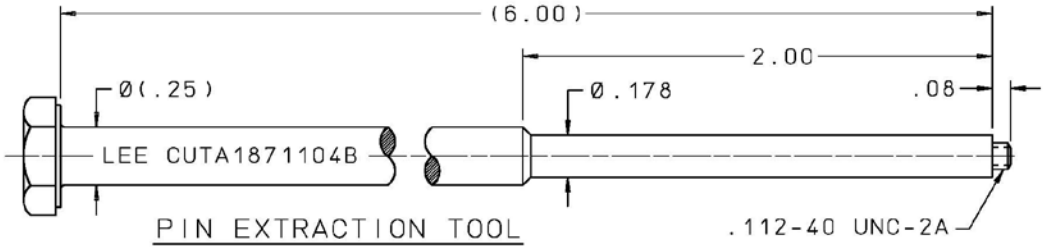
DWG SCALE: NONE | SHEET 1 OF 1

CUTA1870104C

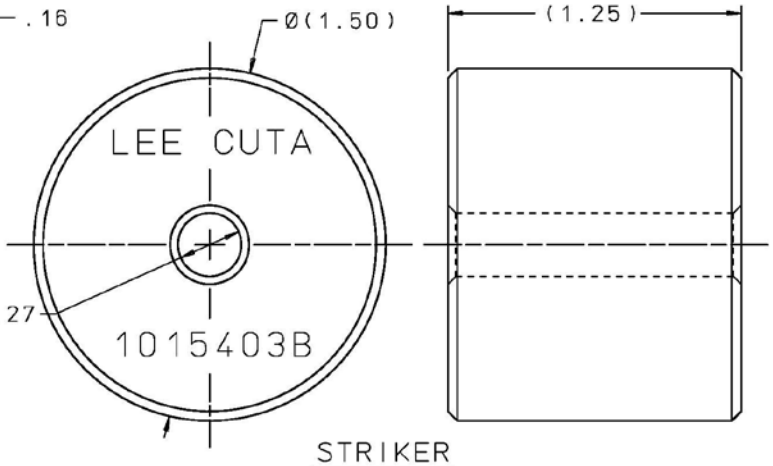
REV	DATE	BY	DESCRIPTION
K3	07-24-00	HM	REMOVED REV LTR FROM MARKINGS ON ALL TOOLS.
4	07-02-10	KD	UPDATED HEX VIEW ON BODY TOOL & PIN EXTR TOOL.



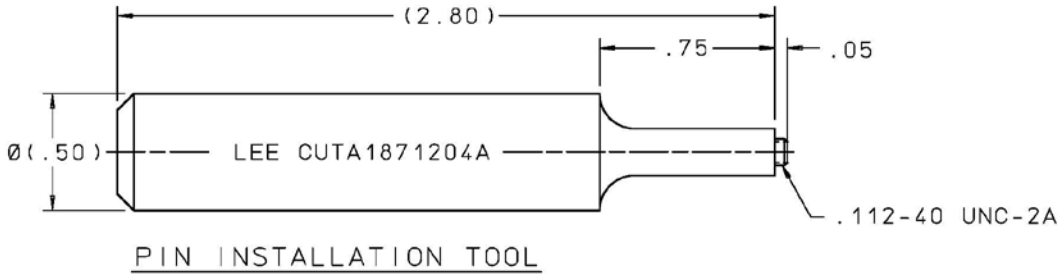
BODY INST & EXTR TOOL



PIN EXTRACTION TOOL



STRIKER



PIN INSTALLATION TOOL

INSTALLATION AND EXTRACTION SET FOR:

.187-.197 LEE DEFLECTOR JET
.187-.197 LEE BENDER JET
.187-.197 LEE FLOW CONTROL
.187-.197 LEE VISCO JET
.187-.197 LEE RESTRICTOR CHEK
.187-.197 LEE JET
.187-.197 LEE TRI
.187-.197 LEE PRI
.187-.197 LEE CHEK
.187-.197 LEE JEVA
.187-.197 LEE SPIN JET
.187-.197 LEE STRAIGHT SQUIRTER

CUTD0101000
REFERENCE

DWG NO: CUTA1870104C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY. ALL MANUFACTURING RIGHTS RESERVED.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	GUY	10-18-62
CHKD BY:	NWS	10-22-62
APPD BY:	G L	
MAT:		
H.T.:		
FINISH:		

LEE TOOL SET
INSTALLATION AND EXTRACTION

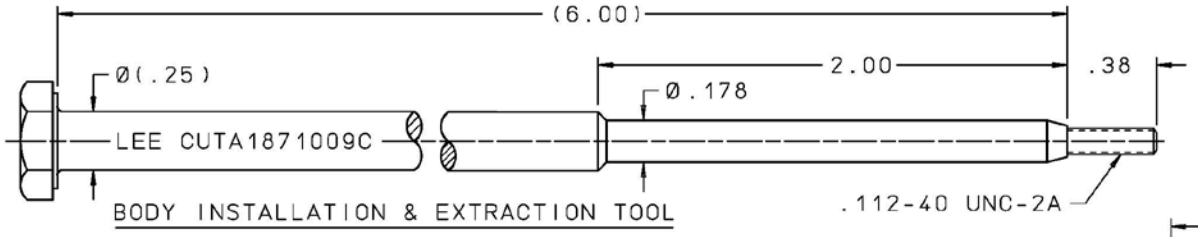
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA1870104C	K

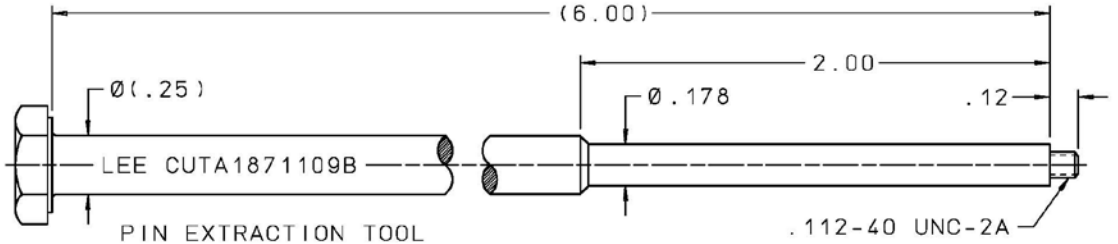
DWG SCALE: NONE SHEET 1 OF 1

CUTA1870109C

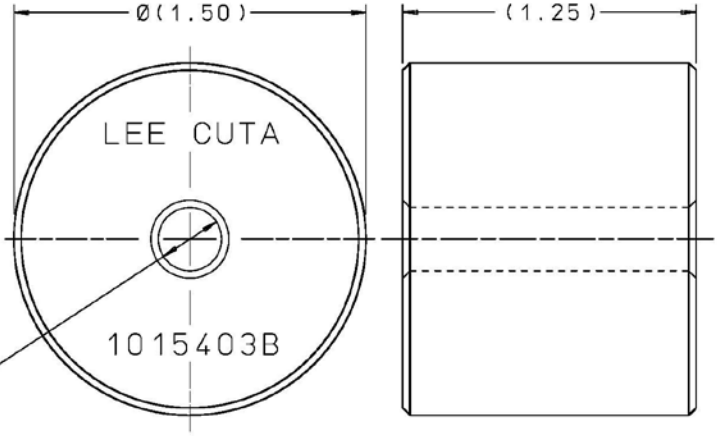
REV	DATE	BY	DESCRIPTION
B2	02-12-08	MC	REMOVED REV LETTERS FROM TOOLS.
3	07-14-10	KD	BODY TOOL: UPDATED HEX. ADDED Ø(.25), PIN EXTRACT TOOL: UPDATED HEX. ADDED Ø(.25), PIN INSTAL TOOL: Ø(.50) WAS Ø.50, (2.80) WAS 2.80, STRIKER: (1.25) WAS 1.25 & Ø(1.50) WAS Ø1.50.



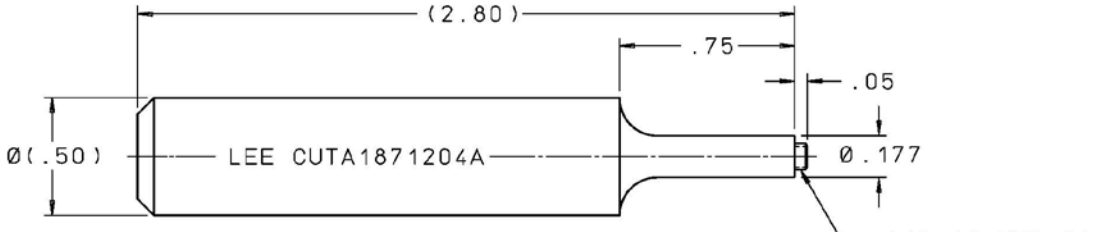
BODY INSTALLATION & EXTRACTION TOOL



PIN EXTRACTION TOOL



STRIKER



PIN INSTALLATION TOOL

INSTALLATION AND EXTRACTION SET FOR:
.187-.197 LEE HIGH PRESSURE BENDER.
.187-.197 LEE HIGH PRESSURE VISCO.

PROPRIETARY ITEM

CUTD0101430
REFERENCE

DWG NO: CUTA1870109C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 | 3 PLACES ±.005 | ANGLES ±5°

DRAWN BY:	S B	12-12-85
CHK'D BY:	J B	12-23-85
APP'D BY:	SEA	03-04-86
MAT:		
H.T.:		
FINISH:		

LEE TOOL SET
INSTALLATION AND EXTRACTION

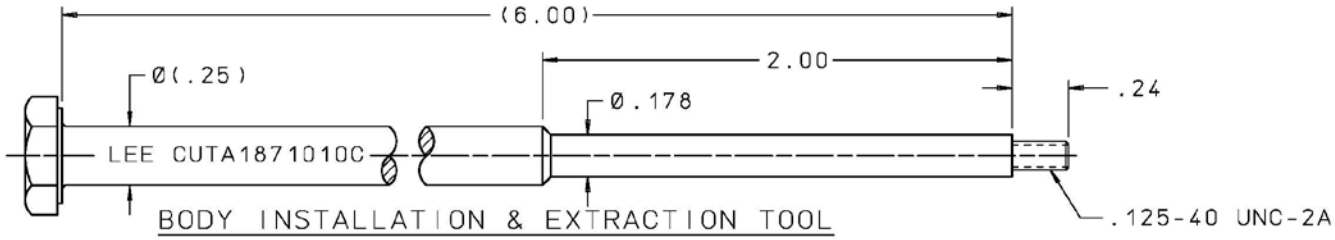
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA1870109C	B

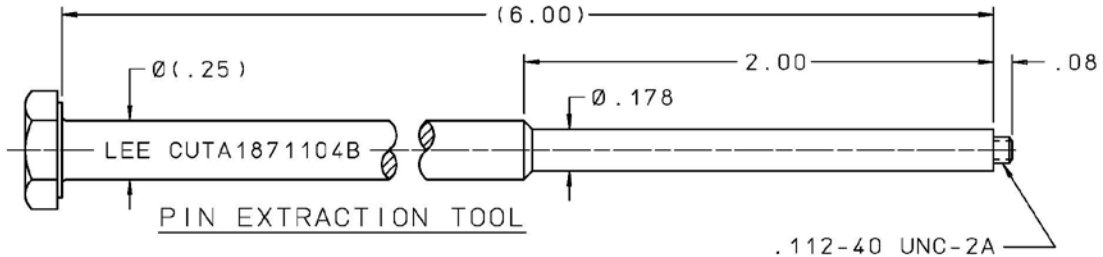
DWG SCALE: NONE | SHEET 1 OF 1

CUTA1870110C

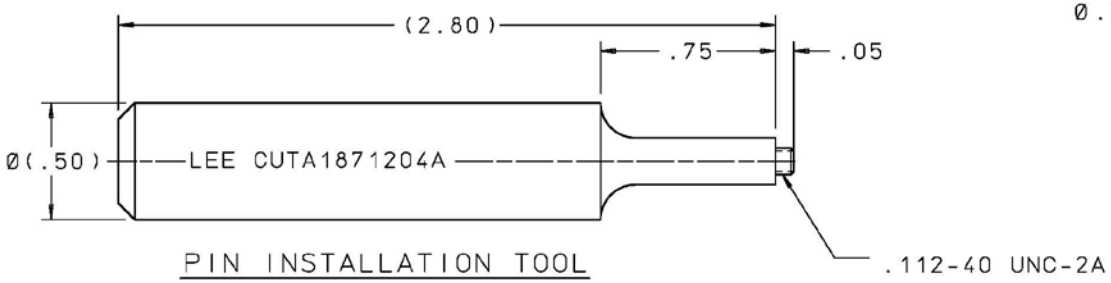
REV	DATE	BY	DESCRIPTION
H2	05-28-09	KD	REMOVED ALL REV LETTERS FROM PART NUMBER MARKINGS.
3	07-09-10	KD	BODY TOOL; ADDED Ø(.25) &(6.00) WAS 6.00. PIN EXTR TOOL ADDED Ø(.25)&(6.00) WAS 6.00. PIN INST TOOL, Ø(.50) WAS 0.50 & (2.80) WAS 2.80. STRIKER; Ø(1.50) WAS Ø1.49 & (1.25) WAS 1.25.



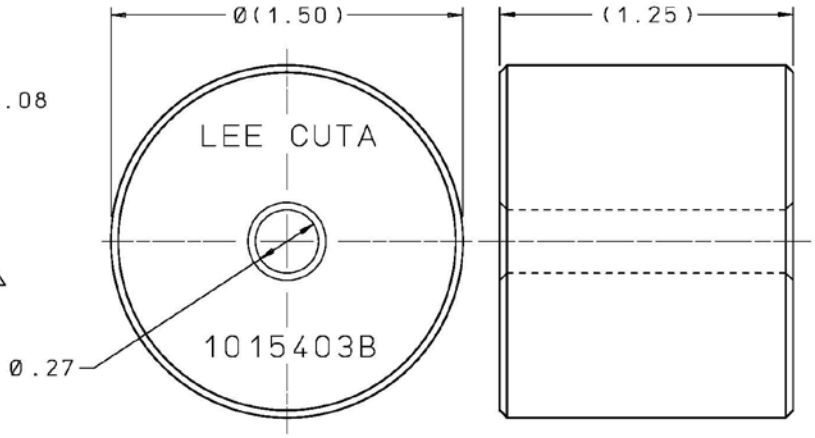
BODY INSTALLATION & EXTRACTION TOOL



PIN EXTRACTION TOOL



PIN INSTALLATION TOOL



STRIKER

INSTALLATION AND EXTRACTION SET FOR:

.187 - .197 LEE HIGHWATT JET
.187 - .197 LEE LOLOHM CHEK

PROPRIETARY ITEM

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CUTD0101050
REFERENCE

DWG NO: CUTA1870110C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY. ALL MANUFACTURING RIGHTS RESERVED.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	E B	08-11-71
CHK'D BY:	P C	07-17-89
APP'D BY:	G L	08-30-71
MAT:		
H.T.:		
FINISH:		

LEE TOOL SET
INSTALLATION AND EXTRACTION

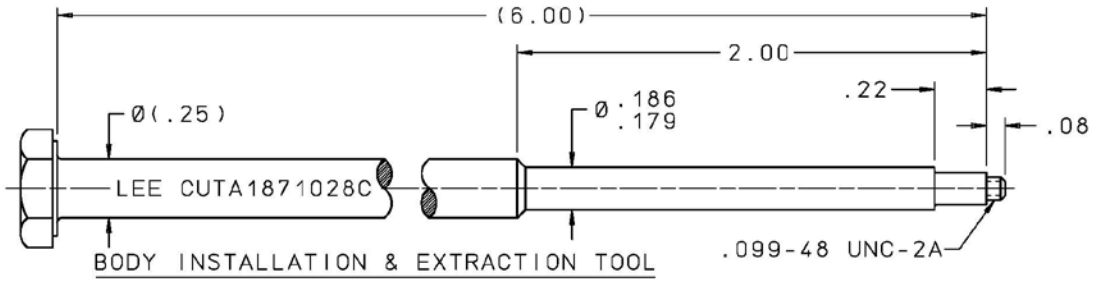
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA1870110C	H

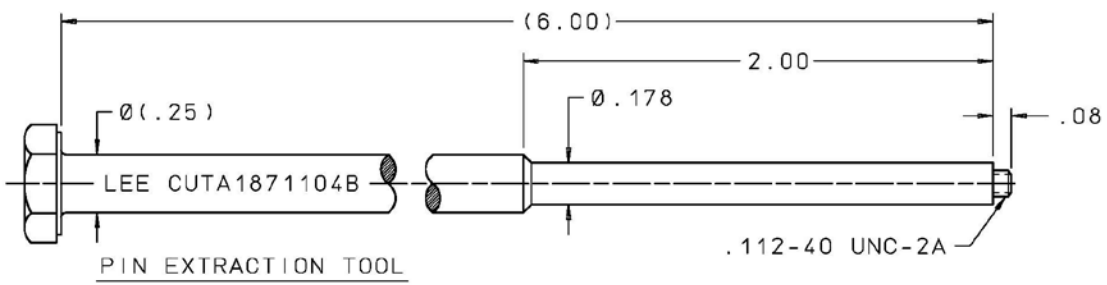
DWG SCALE: NONE SHEET 1 OF 1

CUTA1870128C

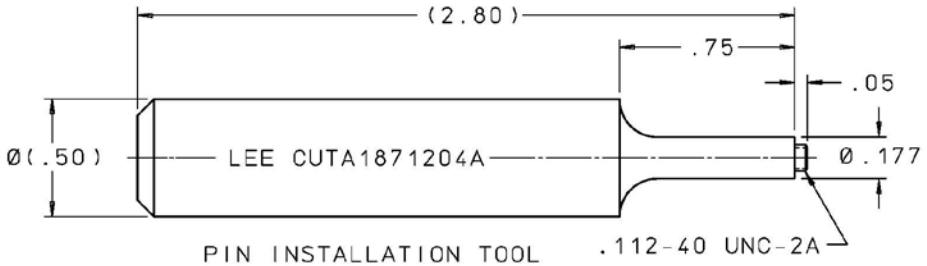
REV	DATE	BY	DESCRIPTION
E2	06-09-04	KD	REMOVED REV LETTERS FROM MARKINGS, BODY TOOL, STRIKER, PIN EXTRACTION AND PIN INSTALLATION TOOL.
3	07-14-10	KD	BODY TOOL: UPDATED HEX. ADDED Ø(.25), Ø.186-.179, .22 & (6.00) WAS 6.00. PIN EXTR TOOL: UPDATED HEX, ADDED Ø(.25),(6.00) WAS 6.00. PIN INSTAL TOOL: Ø(.50) WAS Ø.50, (2.80) WAS 2.80. STRIKER:(1.25) WAS 1.25 & Ø(1.50) WAS Ø1.49.



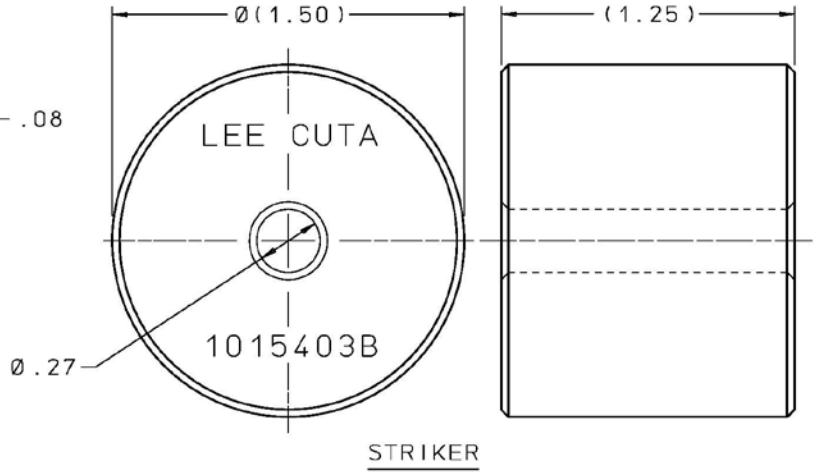
BODY INSTALLATION & EXTRACTION TOOL



PIN EXTRACTION TOOL



PIN INSTALLATION TOOL



STRIKER

INSTALLATION AND EXTRACTION SET FOR:
.187-.197 CARTRIDGE FILTER SCREEN

CUTD0101400
REFERENCE

DWG NO: CUTA1870128C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.
ALL MANUFACTURING RIGHTS RESERVED.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES
TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	E D	07-23-75
CHKD BY:	CJG	07-28-75
APPD BY:	G L	07-28-75
MAT:		
H.T.:		
FINISH:		

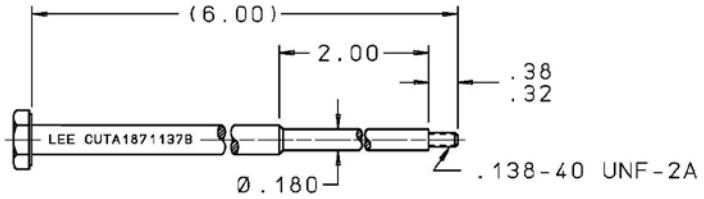
LEE TOOL SET
INSTALLATION AND EXTRACTION

THE LEE COMPANY
WESTBROOK, CT 06498

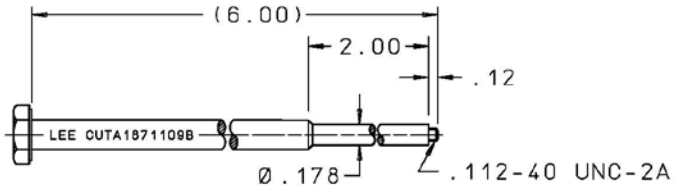
SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA1870128C	E

DWG SCALE: NONE SHEET 1 OF 1

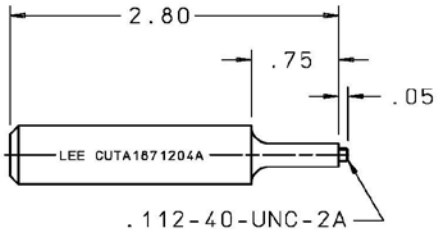
CUTA1870137C



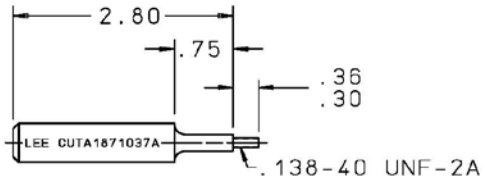
BODY EXTRACTION TOOL



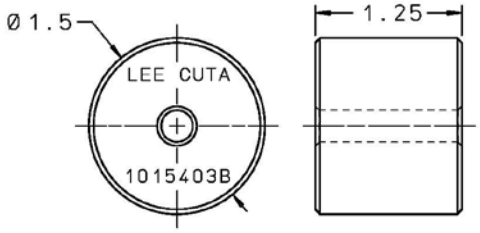
PIN EXTRACTION TOOL



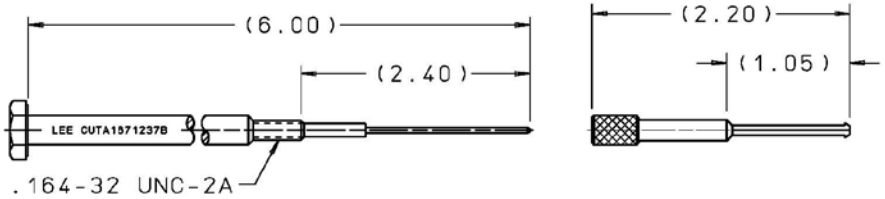
PIN INSTALLATION TOOL



BODY INSTALLATION TOOL



STRIKER



NOSE SEAL EXTRACTION TOOL

REV	DATE	BY	DESCRIPTION
A	08-17-89	KCT	INITIAL RELEASE
2	01-05-90	GMR	CORRECTED MARKING ON NOSE SEAL EXTR TOOL SHEET 2.
B	10-01-90	GMR	BODY EXTR. TOOL: .32-.38 WAS .24 & MARKING REV WAS A. BODY INST TOOL: .30-.36 WAS .22 & MARKING REV WAS A.
2	04-14-08	KD	REMOVED REV LETTER FROM MARKING. UPDATED CONFIGURATION. DELETED SHEET 2.
3	03-26-09	KD	.187/.197 WAS .281/.291
4	03-26-09	KD	BODY EXTRACTION TOOL ADDED 2.00

INSTALLATION AND EXTRACTION SET FOR
LEE .187/.197 SHUTTLE VALVE

CUTD0105420
REFERENCE

DWG NO: CUTA1870137C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 | 3 PLACES ±.005 | ANGLES ±5°

DRAWN BY:	KCT	08-17-89
CHK'D BY:	P C	08-31-89
APP'D BY:	JCD	11-16-89
MAT:		
H.T.:		
FINISH:		

LEE INSTALLATION/EXTRACTION TOOL SET

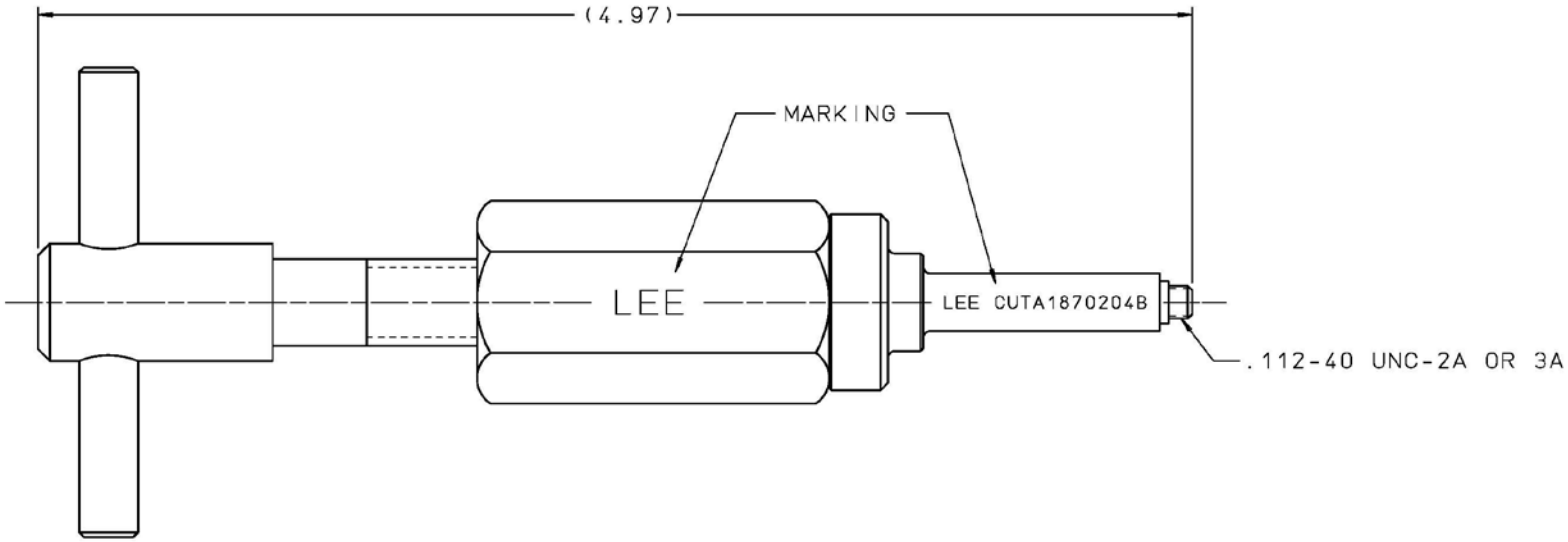
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA1870137C	B

DWG SCALE: NONE | SHEET 1 OF 1

CUTA1870204B

REV	DATE	BY	DESCRIPTION
D3	11-14-94	BR	MARKING WAS "LEE CUTA1870204B 4-40"



CUTD0472100

REFERENCE

DWG NO: CUTA1870204B

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	KMN	06-13-74
CHKD BY:	ECB	08-22-74
APPD BY:	G L	10-25-74
MAT:		
H.T.:		
FINISH:		

LEE JACKING TOOL

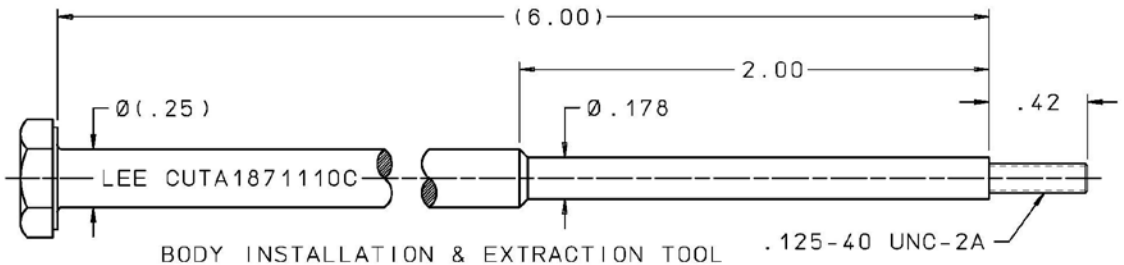
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA1870204B	D

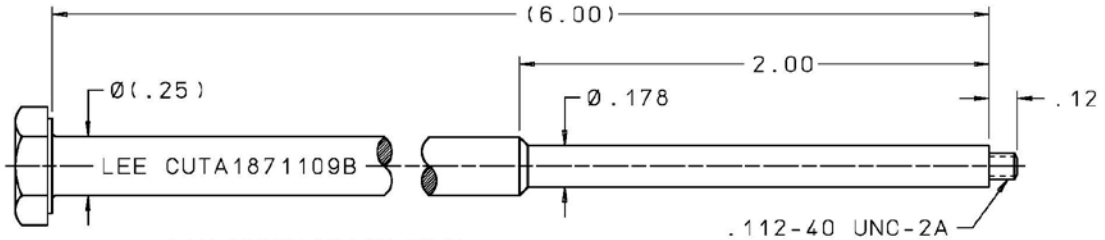
DWG SCALE: NONE SHEET 1 OF 1

CUTA1870210C

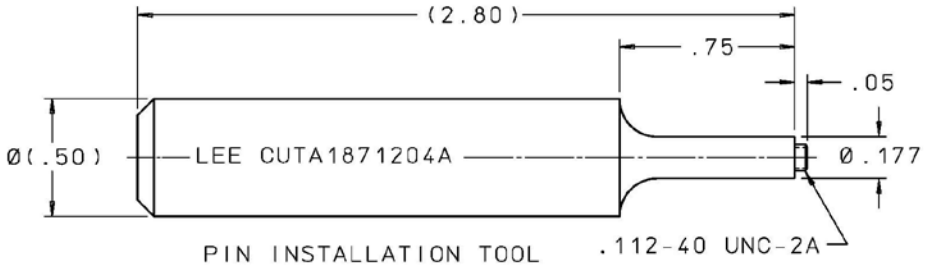
REV	DATE	BY	DESCRIPTION
C2	06-28-04	KD	REMOVED REV LETTERS FROM MARKINGS.
3	07-14-10	KD	BODY TOOL: UPDATED HEX. ADDED Ø(.25), PIN EXTRACT TOOL: UPDATED HEX. ADDED Ø(.25), PIN INSTAL TOOL: Ø(.50) WAS Ø.50, (2.80) WAS 2.80, STRIKER: (1.25) WAS 1.25 & Ø(1.50) WAS Ø1.49.



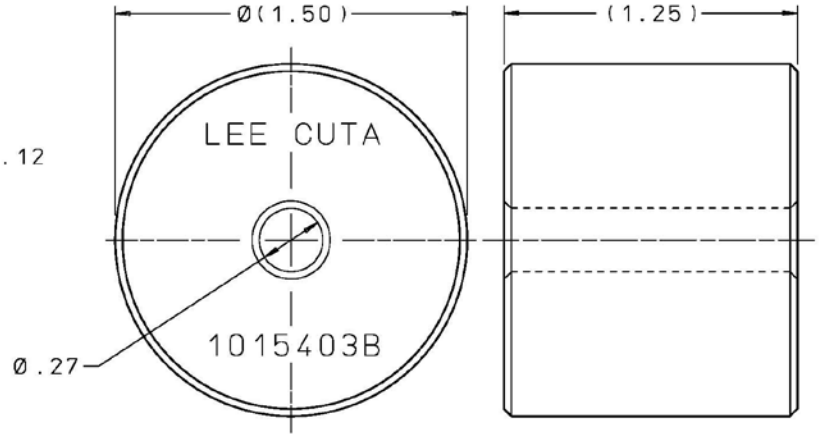
BODY INSTALLATION & EXTRACTION TOOL



PIN EXTRACTION TOOL



PIN INSTALLATION TOOL



STRIKER

INSTALLATION AND EXTRACTION SET FOR:
.187-.197 LEE HIGH PRESSURE HI-WATT JET.
.187-.197 LEE HIGH PRESSURE CHEK.
.187-.197 LEE HIGH PRESSURE TRI

PROPRIETARY ITEM

This document contains proprietary information and is submitted upon the express condition that the information contained herein will not be used directly or indirectly in any way detrimental to the interests of The Lee Company, and/or in violation of regulation DAR 7-104.9(a)(1 July 1974), et seq.

CUTD0101470
REFERENCE

DWG NO: CUTA1870210C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH ✓ ALL OVER
DIMENSIONS ARE IN INCHES
TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	S B	02-26-86
CHKD BY:	B M	02-28-86
APPD BY:	SEA	03-04-86
MAT:		
H.T.:		
FINISH:		

LEE TOOL SET
INSTALLATION AND EXTRACTION

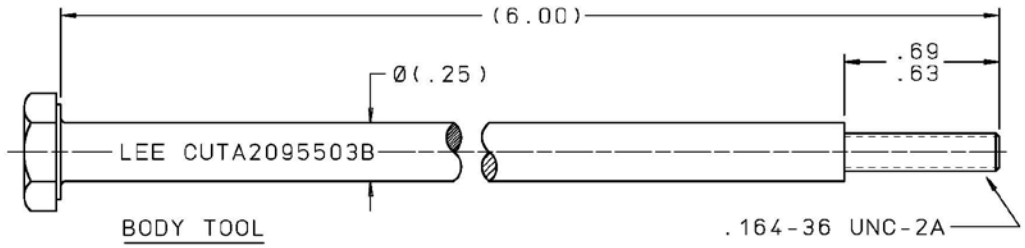
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA1870210C	C

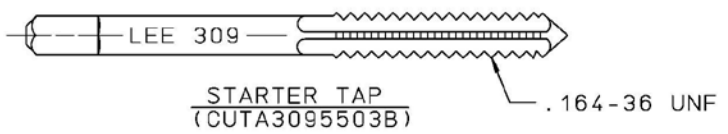
DWG SCALE: NONE SHEET 1 OF 1

CUTA1870306C

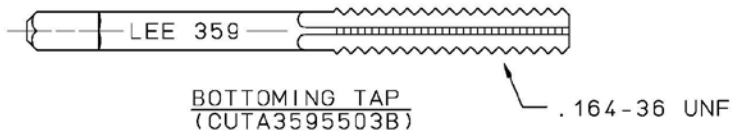
REV	DATE	BY	DESCRIPTION
B2	05-13-10	KD	DELETED REV LETTERS FROM MARKINGS, BODY TOOL, PIN EXTR & PIN INSTALLATION TOOL.



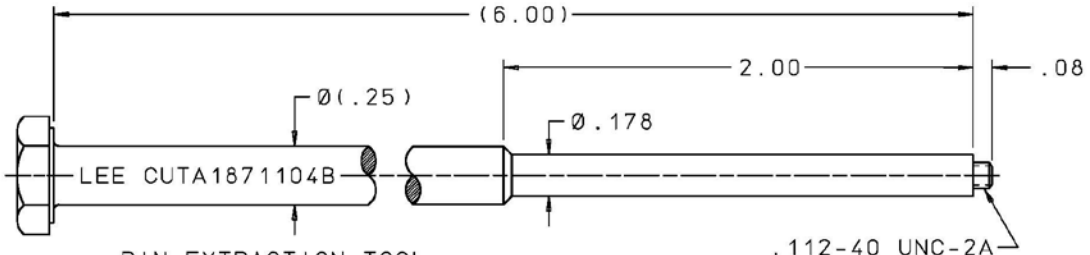
BODY TOOL



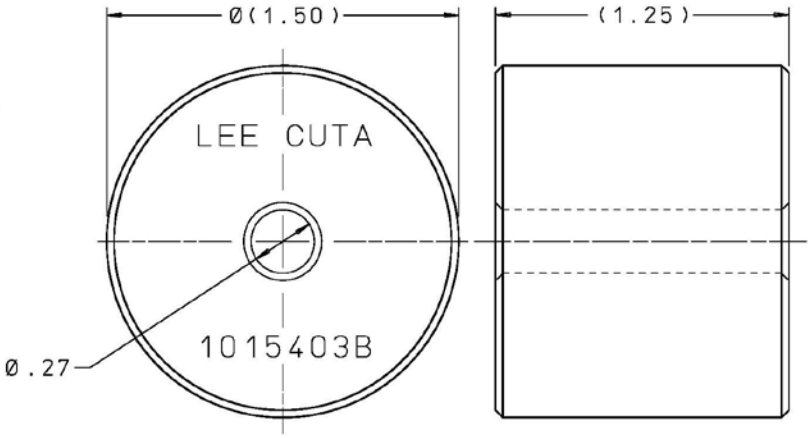
STARTER TAP
(CUTA3095503B)



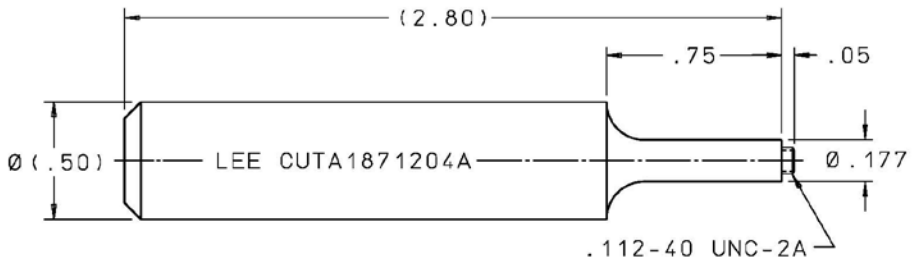
BOTTOMING TAP
(CUTA3595503B)



PIN EXTRACTION TOOL



STRIKER



PIN INSTALLATION TOOL

INSTALLATION AND EXTRACTION SET FOR: .187 LEE CHEK

PROPRIETARY ITEM

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CUTD0101490

REFERENCE

DWG NO: CUTA1870306C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 | 3 PLACES ±.005 | ANGLES ±5°

DRAWN BY:	E D	03-17-86
CHK'D BY:	J B	03-25-86
APP'D BY:	RRH	06-22-86
MAT:		
H.T.:		
FINISH:		

LEE TOOL SET
INSTALLATION AND EXTRACTION

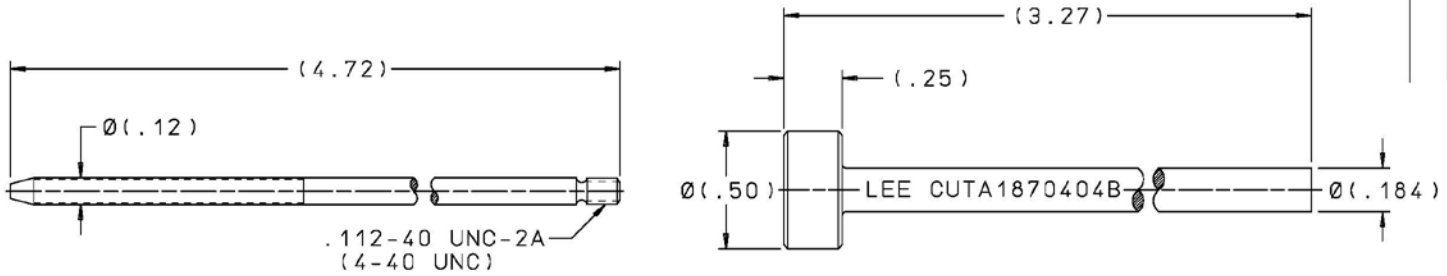
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA1870306C	B

DWG SCALE: NONE | SHEET 1 OF 1

CUTA1870404B

REV	DATE	BY	DESCRIPTION
A	12-09-88	S E	INITIAL RELEASE
B	09-08-90	GMR	ADDED NOTE 1. ADDED JEV,NZS,JEL,SVB TO NOTE 3. 3.27 WAS 1.17, 4.72 WAS 2.62.
2	02-23-05	KD	MARKING WAS CUTA1870404BB.
3	08-12-10	KD	ADDED INSTR CARD. UPDATED PULL SHAFT. (4.72) WAS 4.72 & Ø(.12) WAS Ø.12. JACKING TOOL SLEEVE, (3.27) WAS 3.27 (.25) WAS .25, Ø(.50) WAS Ø.50, Ø(.184) WAS Ø.184.



NOTES:
1. FOR USE WITH LEE RIVET TOOL PART NUMBER CUTA1870504B.
2. USE IN ACCORDANCE WITH LEE COMPANY PROCESS SPECIFICATION 187.
3. USE TO EXTRACT PINS FROM THE FOLLOWING LEE COMPANY PRODUCTS:
   - .187-.197 LEE JET, JET ONLY
   - .187-.197 LEE HI-WATT JET, JEH ONLY
   - .187-.197 LEE BENDER JET, JEB ONLY
   - .187-.197 LEE DEFLECTOR JET, JED ONLY
   - .187-.197 LEE VISCO JET, VDC ONLY
   - .187-.197 LEE CHEK, CKF/CKR ONLY
   - .187-.197 LEE PRI, PRF/PRR ONLY
   - .187-.197 LEE FLOW CONTROL, FCF/FCR ONLY
   - .187-.197 LEE TRI, PRT ONLY
   - .187-.197 LEE CARTRIDGE FILTER SCREEN, FSC ONLY
   - .187-.197 LEE RESTRICTOR CHEK, RCF/RCR ONLY
   - .187-.197 LEE JEVA, JEV ONLY
   - .187-.197 LEE SPIN JET, NZS ONLY
   - .187-.197 LEE LUBRICATION JET, JEL ONLY
   - .187-.197 LEE SHUTTLE VALVE, SVB ONLY

INSTRUCTIONS FOR LEE RIVET TYPE JACKING TOOL:

1. THREAD THE STUD INTO THE PIN TO BE REMOVED. 2 FULL TURNS MINIMUM.
2. SLIDE THE SLEEVE DOWN OVER THE STUD UNTIL IT IS SEATED AGAINST THE END OF THE BODY.
3. ENGAGE THE GROOVED END OF THE STUD INTO THE RIVET TOOL. ALLOW SOME SPACE BETWEEN THE GUN AND THE END OF THE SLEEVE. SQUEEZE THE HANDLE UNTIL THE PIN IS FREE.

CUTD0473000
REFERENCE

DWG NO: CUTA1870404B

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 | 3 PLACES ±.005 | ANGLES ±5°

DRAWN BY:	S E	12-09-88
CHK'D BY:	B M	03-01-89
APP'D BY:	JCD	03-01-89
MAT:		
H.T.:		
FINISH:		

LEE JACKING TOOL SET
.187 X .112-40

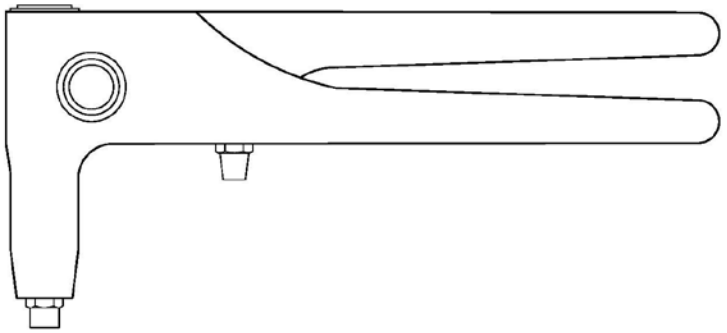
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA1870404B	B

DWG SCALE: NONE | SHEET 1 OF 1

CUTA1870504B

REV	DATE	BY	DESCRIPTION
A	01-27-89	S E	INITIAL RELEASE
2	09-06-90	GMR	NOTE 1: CUTA2500606B WAS CUTA2500306B. CUTA2500706B WAS CUTA2500506B



NOTES:
1. FOR USE WITH LEE EXTRACTION TOOLS CUTA1870404B, CUTA2500606B, CUTA2500313B AND CUTA2500706B.
2. USE IN ACCORDANCE WITH LEE PROCESS SPECIFICATION 187.

CUTD0473350B

REFERENCE

DWG NO: CUTA1870504B

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH ✓ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	S E	1-27-89
CHKD BY:	B M	2-06-89
APPD BY:	JCD	2-06-89
MAT:		
H.T.:		
FINISH:		

LEE RIVET TOOL

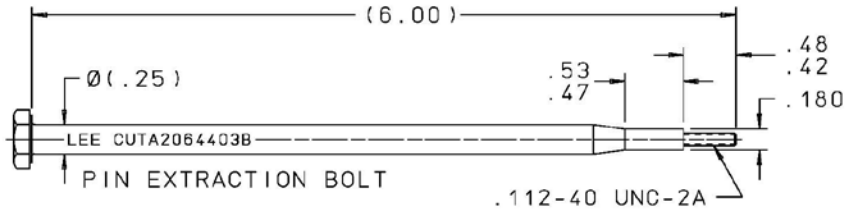
THE LEE COMPANY
WESTBROOK, CT 06498

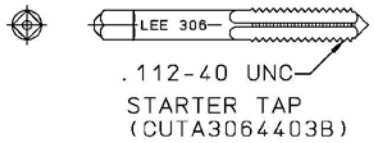
SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA1870504B	A

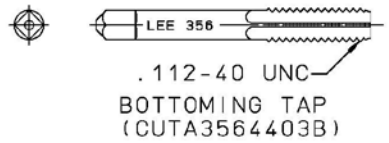
DWG SCALE: NONE SHEET 1 OF 1

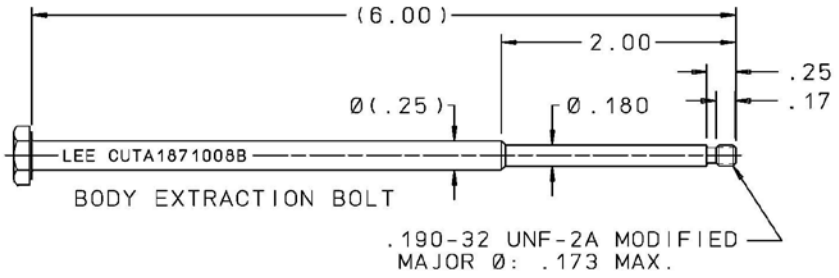
CUTA1870801C

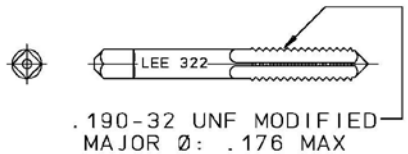
REV	DATE	BY	DESCRIPTION
A	11-01-95	BR	INITIAL RELEASE
2	05-17-10	KD	REMOVED REV LETTER FROM PIN & BODY EXTRACTION BOLT & STRIKER.

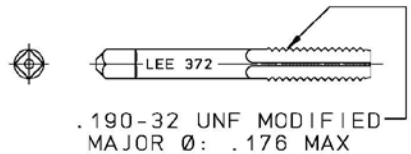


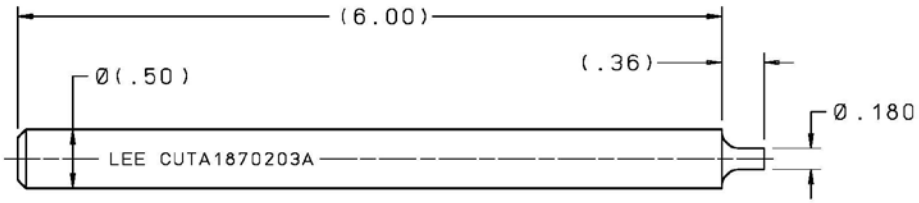


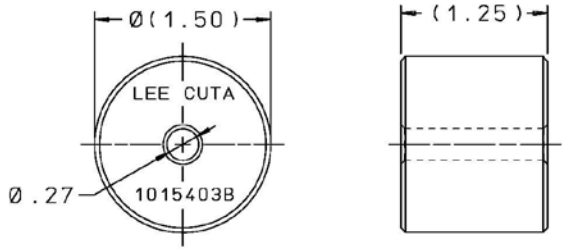












INSTALLATION AND EXTRACTION SET FOR: 187 LUBRICATION JET

PROPRIETARY ITEM

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CUTD0105660
REFERENCE

DWG NO. CUTA1870801C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY. ALL MANUFACTURING RIGHTS RESERVED.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	B R	11-01-95
CHK'D BY:	L B	11-03-95
APP'D BY:	B B	11-07-95
MAT:		
H.T.:		
FINISH:		

LEE INSTALLATION/EXTRACTION TOOL SET 187 AND 197 JELA

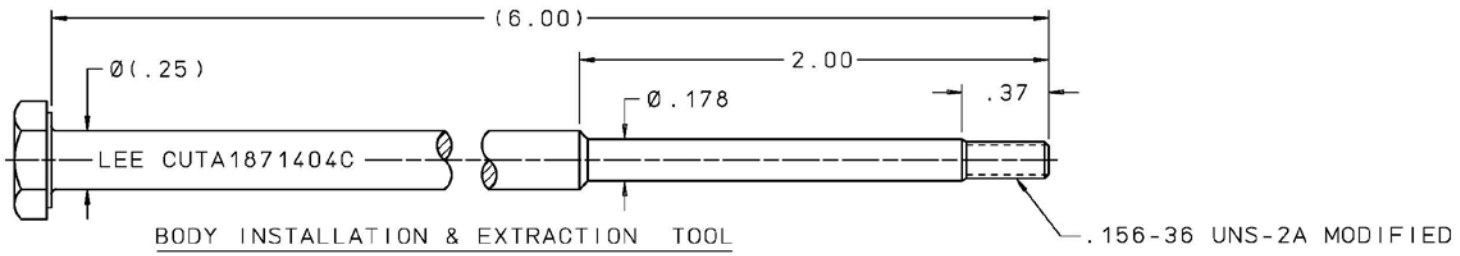
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA1870801C	A

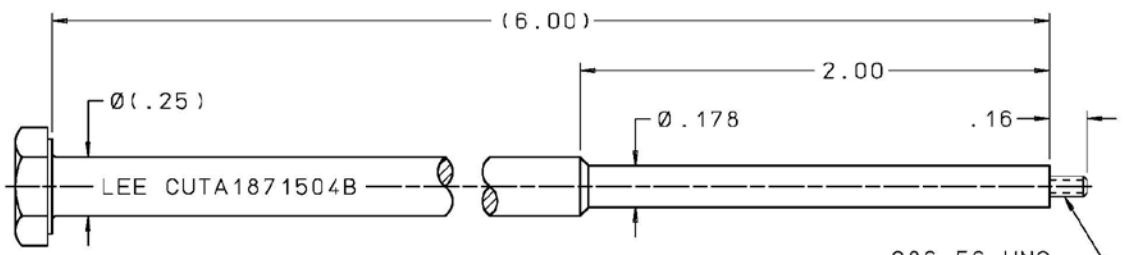
DWG SCALE: NONE SHEET 1 OF 1

CUTA1870904C

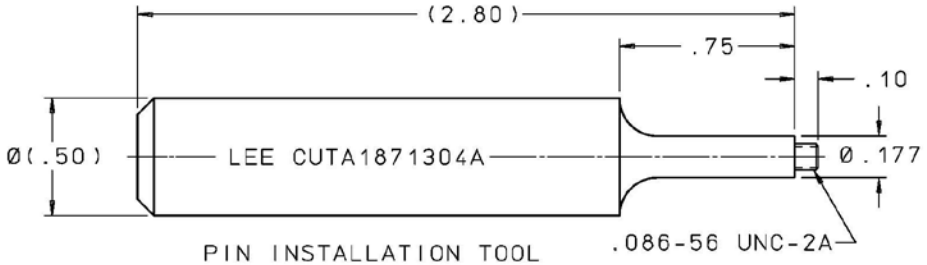
REV	DATE	BY	DESCRIPTION
B2	07-15-10	KD	BODY TOOL: UPDATED HEX. (6.00) WAS 6.00 & Ø(.25) WAS Ø.25. PIN EXTRACT TOOL: UPDATED HEX. ADDED Ø(.25) & (6.00) WAS 6.00. PIN INSTAL TOOL: Ø(.50) WAS Ø.50 & (2.80) WAS 2.80. STRIKER: (1.25) WAS 1.25 & Ø(1.50) WAS Ø1.49.



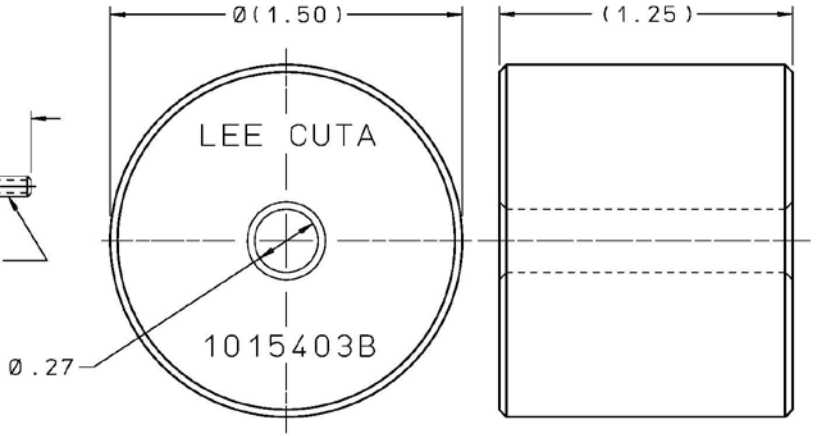
BODY INSTALLATION & EXTRACTION TOOL



PIN EXTRACTION TOOL



PIN INSTALLATION TOOL



STRIKER

INSTALLATION AND EXTRACTION SET FOR:
.187-.197 LEE 5K JET

PROPRIETARY ITEM

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CUTD0407020

REFERENCE

DWG NO: CUTA1870904C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	B R	02-08-93
CHK'D BY:	L B	02-18-93
APP'D BY:	B B	02-10-93
MAT:		
H.T.:		
FINISH:		

LEE TOOL SET
INSTALLATION AND EXTRACTION

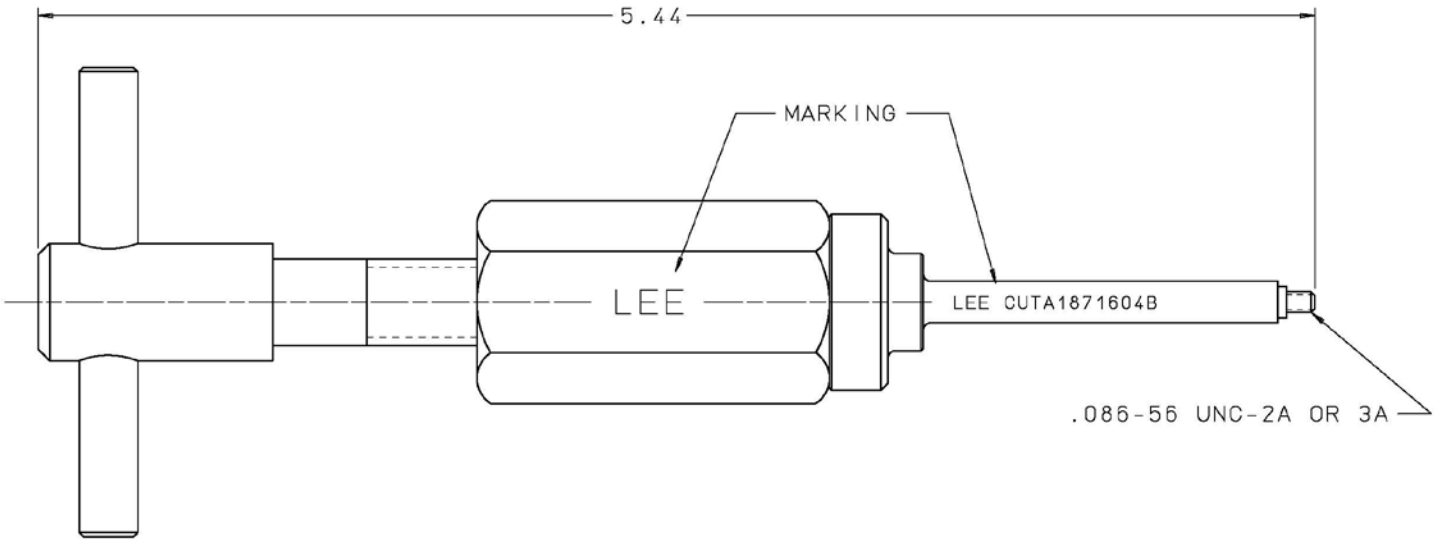
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA1870904C	B

DWG SCALE: NONE SHEET 1 OF 1

CUTA1871604B

REV	DATE	BY	DESCRIPTION
A	05-10-07	MC	INITIAL RELEASE



PROPRIETARY ITEM

This document contains proprietary information and is submitted upon the express condition that the information contained herein will not be used directly or indirectly in any way detrimental to the interests of The Lee Company, and/or in violation of regulation DAR 7-104.9(a)(1 July 1974), et seq.

CUTD0507850

REFERENCE

DWG NO: CUTA1871604B

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY. ALL MANUFACTURING RIGHTS RESERVED.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES
TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	M C	05-10-07
CHK'D BY:	DEP	05-16-07
APP'D BY:	B B	05-25-07
MAT:		
H.T.:		
FINISH:		

JACKING TOOL, 5K JET PIN

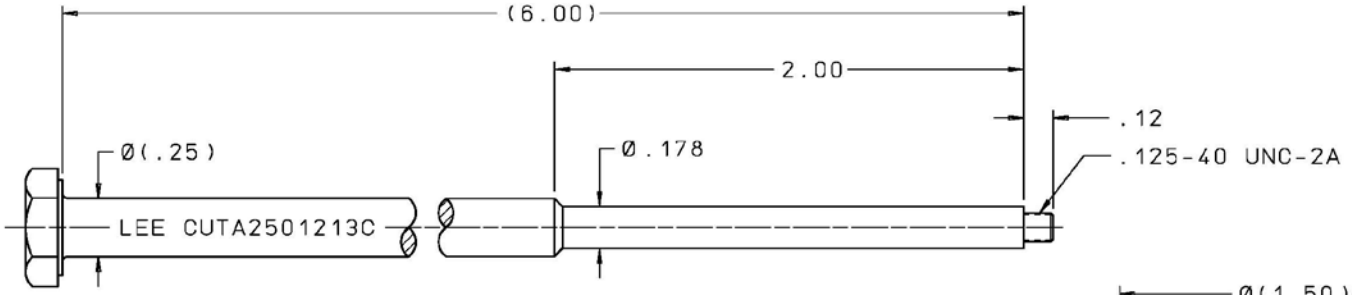
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA1871604B	A

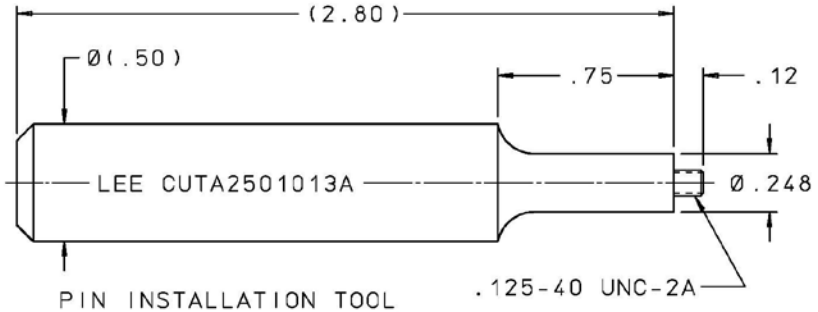
DWG SCALE: NONE SHEET 1 OF 1

CUTA2000113C

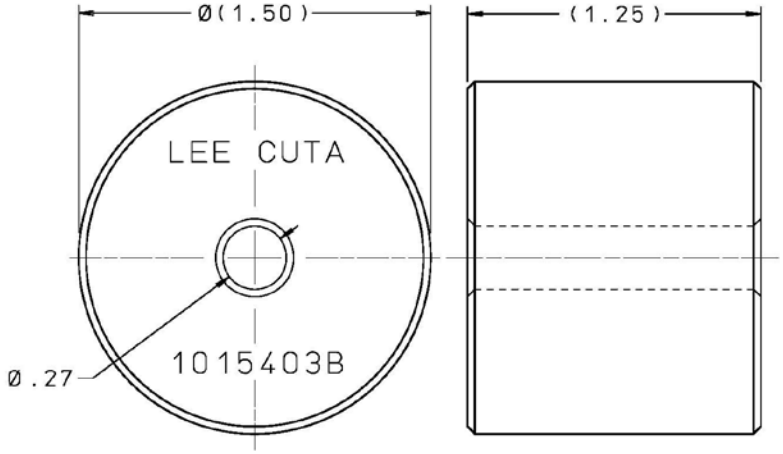
REV	DATE	BY	DESCRIPTION
L2	05-22-00	HM	REMOVED REV. LTR FROM MARKING.
M	07-30-10	KD	BODY TOOL/PIN EXT TOOL: REMOVED HEX. ADDED 2 FLATS. PIN INST TOOL: Ø(.50) WAS Ø.50 & (2.80) WAS 2.80. STRIKER: Ø(1.50) WAS Ø1.49 & (1.25) WAS 1.25



BODY TOOL/PIN EXTRACTION TOOL



PIN INSTALLATION TOOL



STRIKER

INSTALLATION AND EXTRACTION SET FOR:
250-.260 LEE SHORT AXIAL VISCO JET

CUTD0101100
REFERENCE

DWG NO: CUTA2000113C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY. ALL MANUFACTURING RIGHTS RESERVED.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	JED	2-12-69
CHKD BY:		
APPD BY:	G L	
MAT:		
H.T.:		
FINISH:		

LEE TOOL SET
INSTALLATION AND EXTRACTION

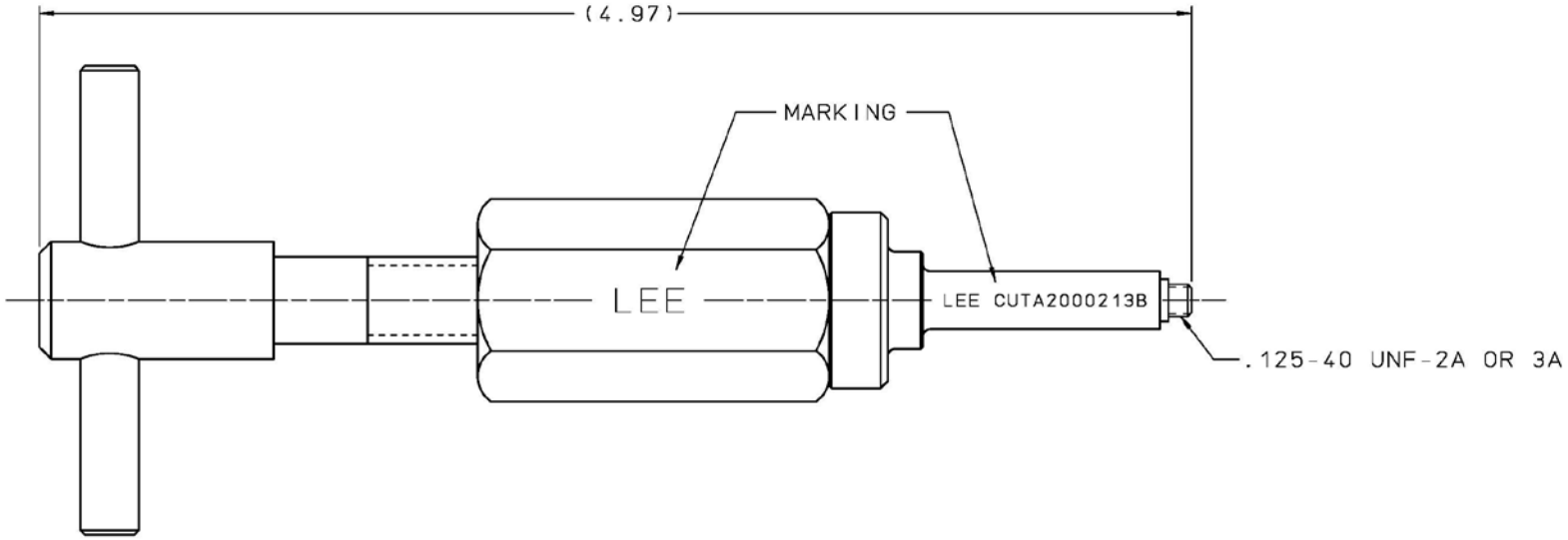
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA2000113C	M

DWG SCALE: NONE SHEET 1 OF 1

CUTA2000213B

REV	DATE	BY	DESCRIPTION
C	09-10-76	KS	DWG NO. WAS CUTX-0472300A
2	09-29-80	TD	OAL WAS (4.91)
3	06-13-91	GR	MARKING WAS 'LEE CUTA2000213B 5-40'
4	11-14-94	BR	MARKING WAS 'LEE CUTA2000213BD'



CUTD0472300

REFERENCE

DWG NO: CUTA2000213B

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	S B	07-02-87
CHK'D BY:	J B	07-29-87
APP'D BY:	SEA	08-03-87
MAT:		
H.T.:		
FINISH:		

LEE JACKING TOOL

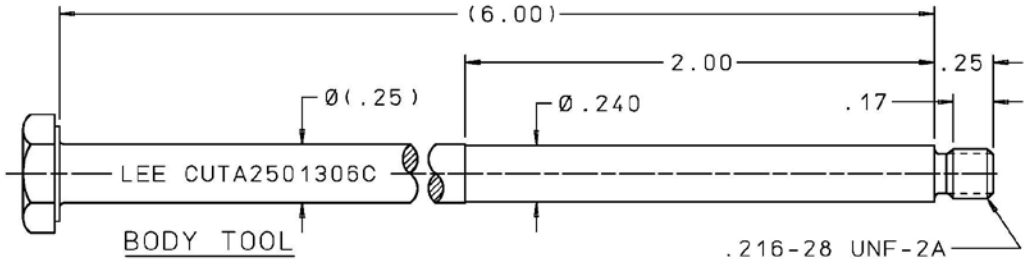
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA2000213B	C

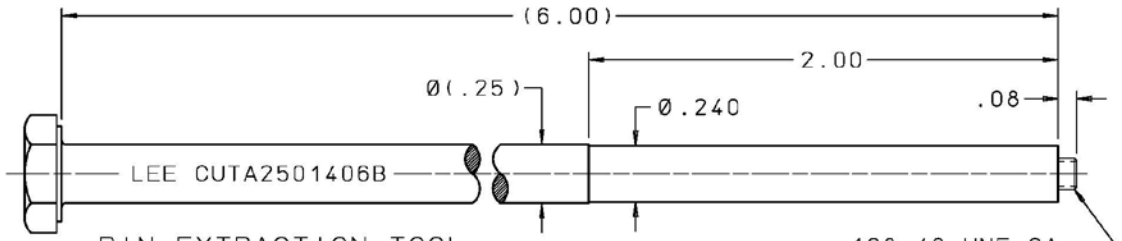
DWG SCALE: NONE SHEET 1 OF 1

CUTA2500106C

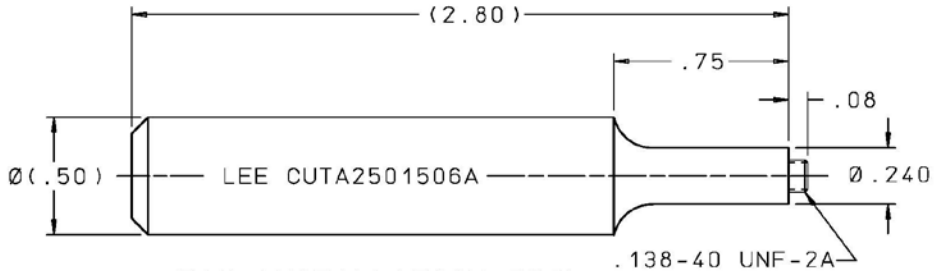
REV	DATE	BY	DESCRIPTION
K2	05-05-10	KD	DELETED REV LETTERS FROM MARKINGS, BODY TOOL, PIN EXTRACTION PIN INSTALLATION TOOL & STRIKER.



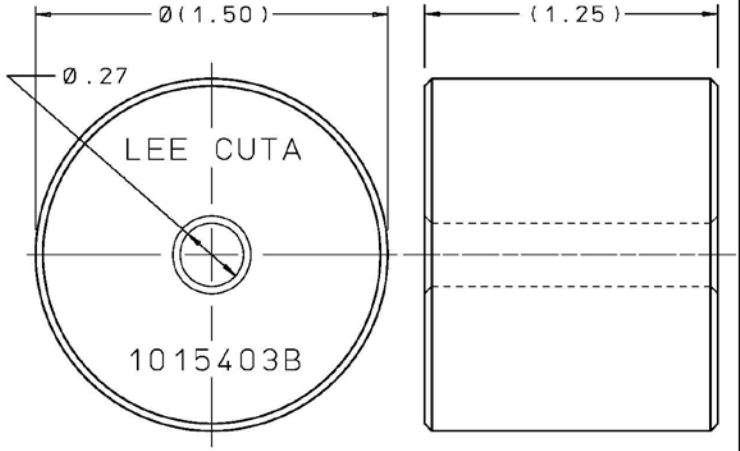
BODY TOOL



PIN EXTRACTION TOOL



PIN INSTALLATION TOOL



STRIKER

INSTALLATION AND EXTRACTION SET FOR:

.250-.260 LEE CHEKS
.250-.260 LEE AXIAL VISCO JETS

CUTD0101150
REFERENCE

DWG NO: CUTA2500106C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 | 3 PLACES ±.005 | ANGLES ±5°

DRAWN BY:	GUY	10-18-62
CHKD BY:	J B	04-09-84
APPD BY:	G L	
MAT:		
H.T.:		
FINISH:		

LEE TOOL SET
INSTALLATION AND EXTRACTION

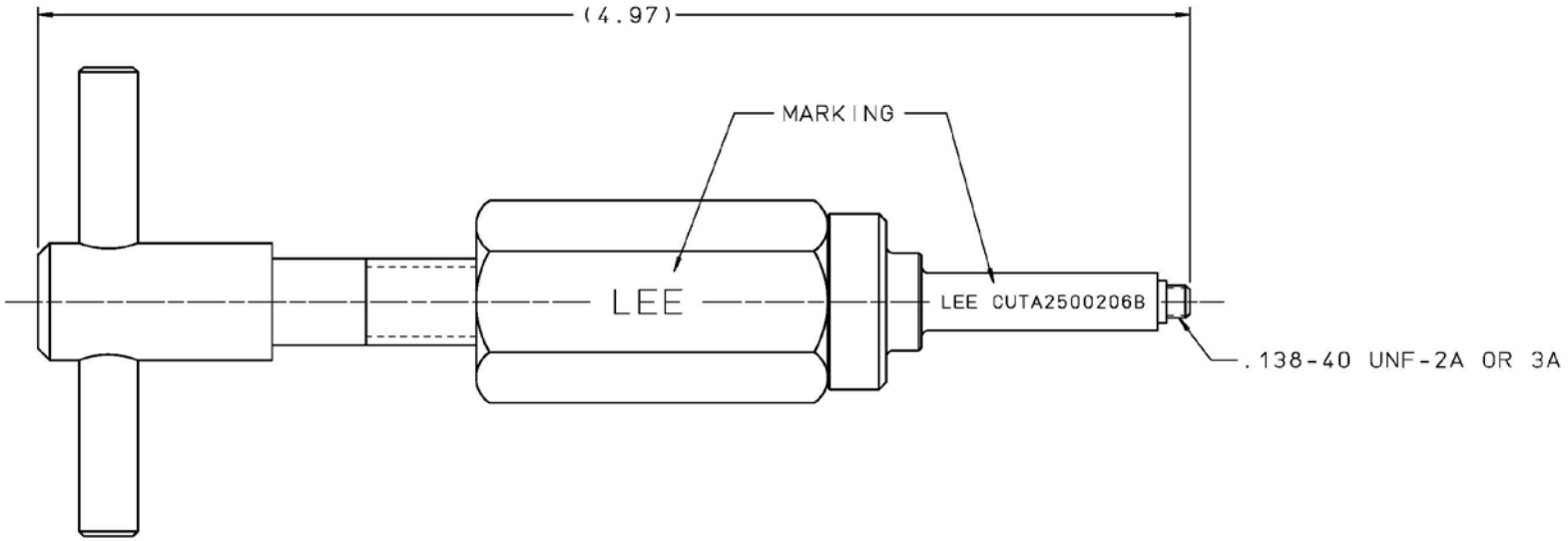
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA2500106C	K

DWG SCALE: NONE | SHEET 1 OF 1

CUTA2500206B

REV	DATE	BY	DESCRIPTION
D	08-10-76	KMS	REDRAWN TO NEW FMT
2	09-29-80	T D	OAL WAS (4.91)
3	12-08-83	TLC	MARKING WAS 'LEE CUTA2500206B 6-40'
4	06-12-91	GMR	REDRAWN TO CAD, DWG WAS A SIZE
5	02-03-93	BR	REMOVED REV LETER FROM MARKING
6	10-11-93	BR	ADDED 'OR 3A'



PROPRIETARY ITEM

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CUTD0472200

REFERENCE

DWG NO: CUTA2500206B

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	KMN	06-13-74
CHK'D BY:	ECB	08-22-74
APP'D BY:	G L	10-25-74
MAT:		
H.T.:		
FINISH:		

LEE JACKING TOOL

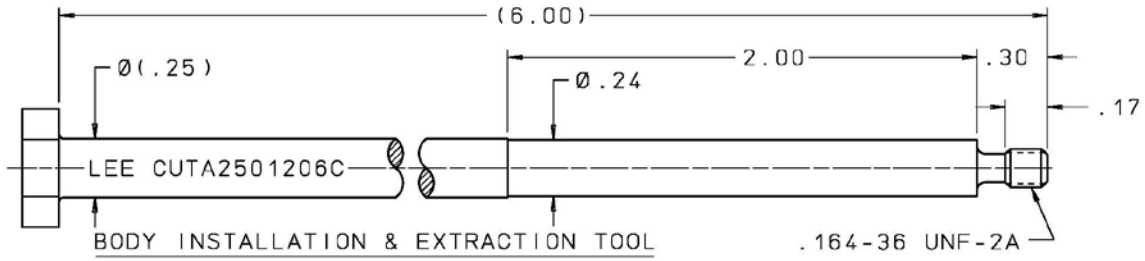
THE LEE COMPANY
WESTBROOK, CT 06498

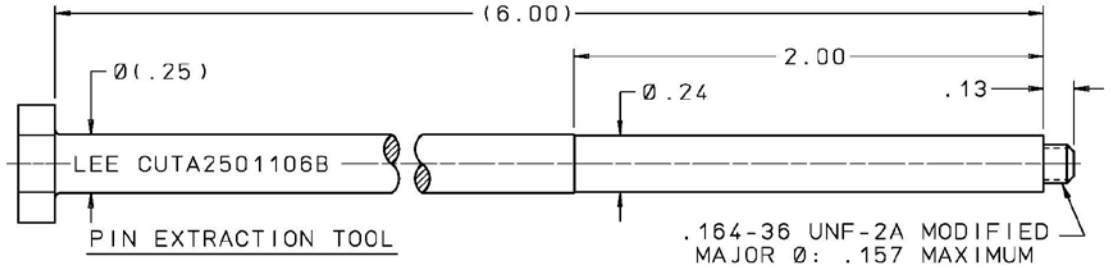
SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA2500206B	D

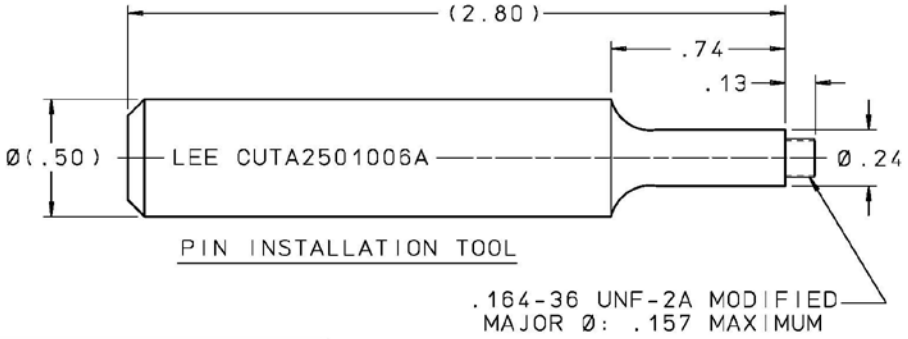
DWG SCALE: NONE SHEET 1 OF 1

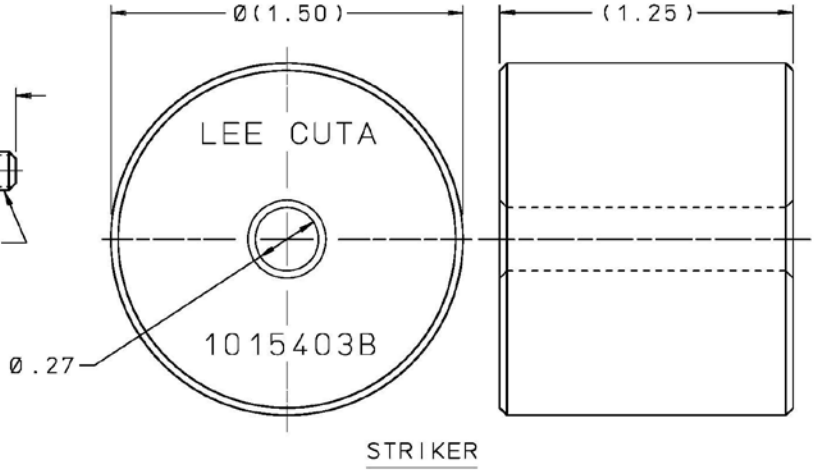
CUTA2500306C

REV	DATE	BY	DESCRIPTION
B3	08-06-04	KD	REMOVED REV LETTERS FROM MARKINGS.
C	09-16-10	KD	BODY INST/EXTR TOOL & PIN EXTR TOOL, REMOVED HEX & ADDED 2 FLATS. STRIKER: (1.25)WAS 1.25 & Ø(1.50) WAS Ø1.50.









INSTALLATION AND EXTRACTION SET FOR:
.250-.260 LEE LOLOHM CHEK

PROPRIETARY ITEM

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CUTD0100880
REFERENCE

DWG NO: CUTA2500306C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 | 3 PLACES ±.005 | ANGLES ±5°

DRAWN BY:	THD	06-08-87
CHK'D BY:	J B	06-16-87
APP'D BY:	SEA	08-03-87
MAT:		
H.T.:		
FINISH:		

LEE TOOL SET
INSTALLATION AND EXTRACTION

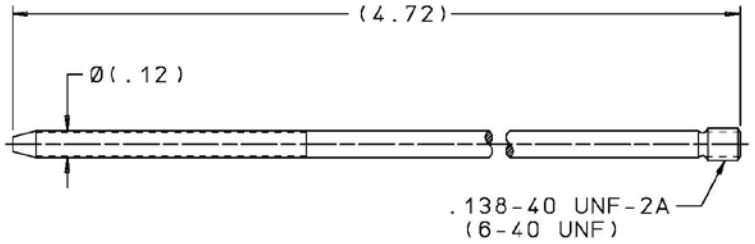
THE LEE COMPANY
WESTBROOK, CT 06498

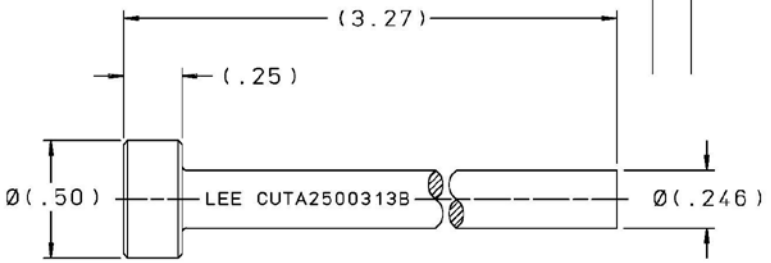
SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA2500306C	C

DWG SCALE: NONE | SHEET 1 OF 1

CUTA2500313B

REV	DATE	BY	DESCRIPTION
A	12-09-88	S E	INITIAL RELEASE
B	09-08-90	GMR	3.27 WAS 1.17, 4.72 WAS 2.62, ADDED NOTE 1.
2	02-28-07	HM	REMOVED REV LTR. FROM MARKING.
3	08-12-10	KD	ADDED INSTR CARD. UPDATED PULL SHAFT. (4.72) WAS 4.72 & Ø(.12) WAS Ø.12. JACKING TOOL SLEEVE, (3.27) WAS 3.27 (.25) WAS .25, Ø(.50) WAS Ø.50, Ø(.246) WAS Ø.246.





INSTRUCTIONS FOR LEE RIVET TYPE JACKING TOOL:

1. THREAD THE STUD INTO THE PIN TO BE REMOVED. 2 FULL TURNS MINIMUM.
2. SLIDE THE SLEEVE DOWN OVER THE STUD UNTIL IT IS SEATED AGAINST THE END OF THE BODY.
3. ENGAGE THE GROOVED END OF THE STUD INTO THE RIVET TOOL. ALLOW SOME SPACE BETWEEN THE GUN AND THE END OF THE SLEEVE. SQUEEZE THE HANDLE UNTIL THE PIN IS FREE.

NOTES:
1. FOR USE WITH LEE RIVET TOOL PART NUMBER CUTA1870504B.
2. USE IN ACCORDANCE WITH LEE COMPANY PROCESS SPECIFICATION 187.
3. USE TO EXTRACT PINS FROM THE FOLLOWING LEE COMPANY PRODUCTS:
   .250-.260 LEE CHEK, CKF/CKR ONLY.
   .250-.260 LEE AXIAL VISCO JET, VXC 2502 AND 2503 ONLY.

CUTD0473100
REFERENCE

DWG NO. CUTA2500313B

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 | 3 PLACES ±.005 | ANGLES ±5°

DRAWN BY:	S E	12-09-88
CHK'D BY:	B M	03-01-89
APP'D BY:	JCD	03-01-89
MAT:		
H.T.:		
FINISH:		

LEE JACKING TOOL SET
.250 X .138-40

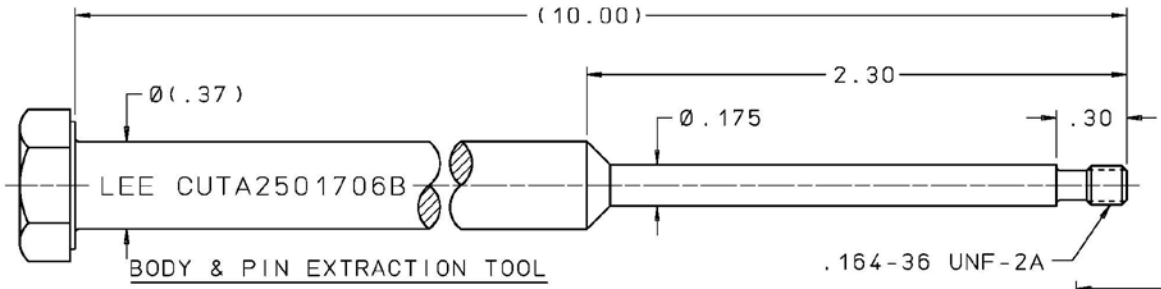
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA2500313B	B

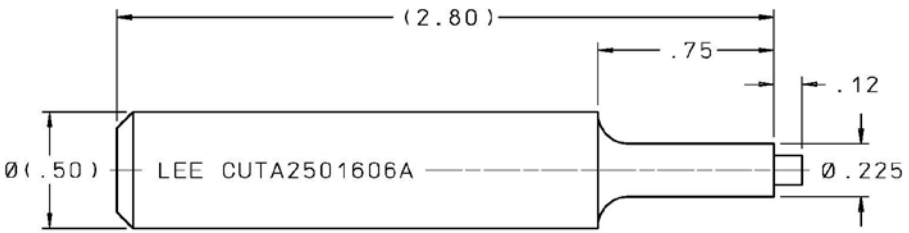
DWG SCALE: NONE | SHEET 1 OF 1

CUTA2500406C

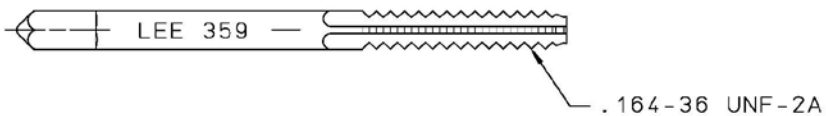
REV	DATE	BY	DESCRIPTION
A	02-07-90	GMR	INITIAL RELEASE
B	05-01-90	GMR	BODY/PIN EXTRACTION TOOL: Ø.175 WAS Ø.240
2	05-04-00	HM	REDRAWN NEW FORMAT REMOVED REV LETTERS FROM MARKINGS.
3	07-28-10	KD	BODY/PIN EXTR TOOL: UPDATED HEX & ADDED Ø(.37). PIN INST TOOL: ADDED .12. (2.80) WAS 2.80. Ø(.50) WAS Ø.50. STRIKER: Ø(2.00) WAS Ø2.00



BODY & PIN EXTRACTION TOOL

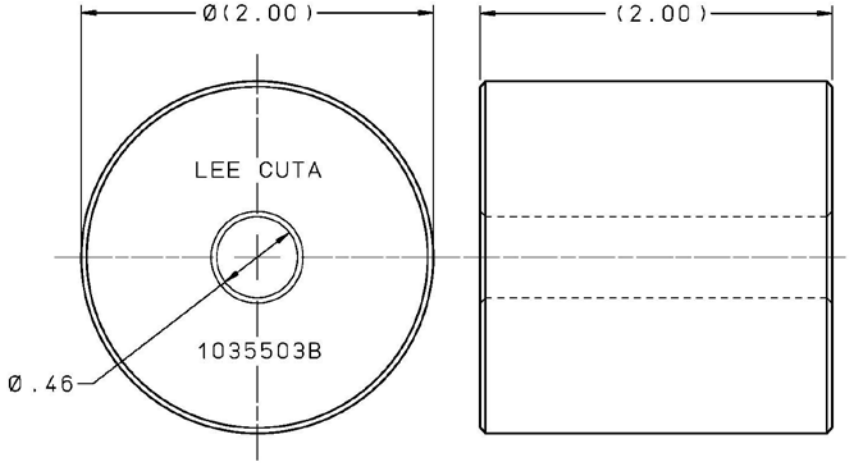


PIN INSTALLATION TOOL



BOTTOMING TAP (PIN EXTRACTION)

CUTA3595503B



STRIKER

TOOL SET FOR INSTALLATION AND EXTRACTION OF:
LEE .250-.260 HIGH STRENGTH CHEKS

PROPRIETARY ITEM

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CUTD0101570

REFERENCE

DWG NO: CUTA2500406C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 | 3 PLACES ±.005 | ANGLES ±5°

DRAWN BY:	GMR	02-07-90
CHKD BY:	P C	02-16-90
APPD BY:	JCD	02-19-90
MAT:		
H.T.:		
FINISH:		

LEE TOOL SET
INSTALLATION/EXTRACTION

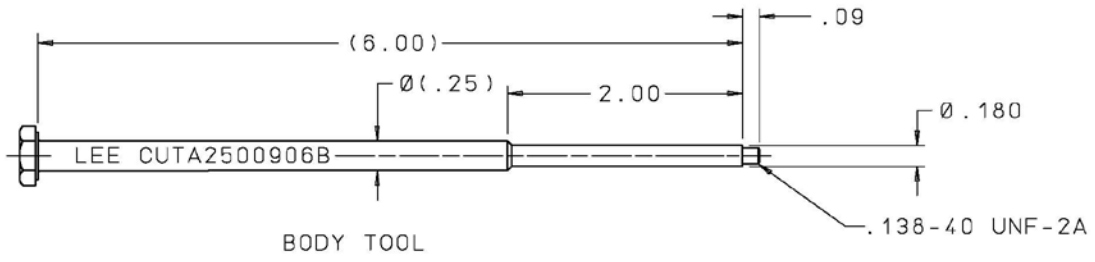
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA2500406C	B

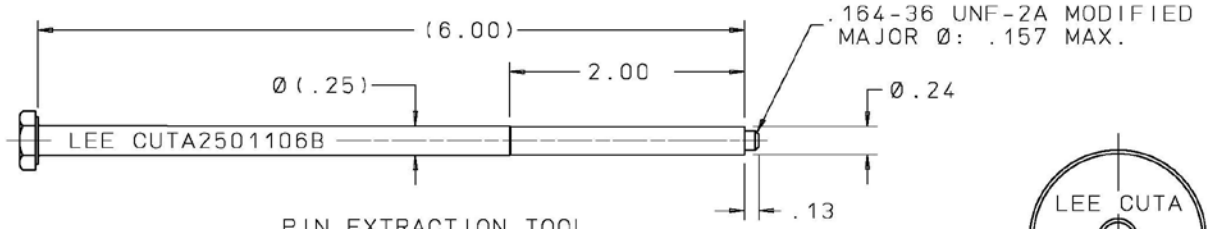
DWG SCALE: NONE | SHEET 1 OF 1

CUTA2500506C

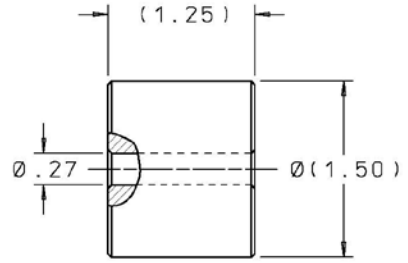
REV	DATE	BY	DESCRIPTION
A	01-13-00	HM	INITIAL RELEASE
B	03-21-00	HM	BODY TOOL WAS CUTA1871137B
2	05-13-10	MC	RMV REV LETTER FROM STRIKER MARKING.



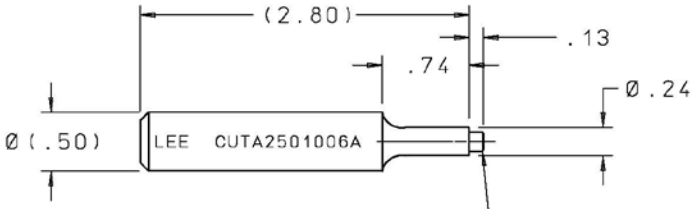
BODY TOOL



PIN EXTRACTION TOOL



STRIKER



PIN INSTALLATION TOOL

INSTALLATION AND EXTRACTION SET FOR:

.250 LEE ZERO LEAK

PROPRIETARY ITEM

CUTD0407270

REFERENCE

DWG NO. CUTA2500506C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 | 3 PLACES ±.005 | ANGLES ±5°

DRAWN BY:	H M	01-13-00
CHK'D BY:	L B	01-14-00
APPD BY:	B B	01-19-00

MAT:

H.T.:

FINISH:

LEE TOOL SET
INSTALLATION AND EXTRACTION

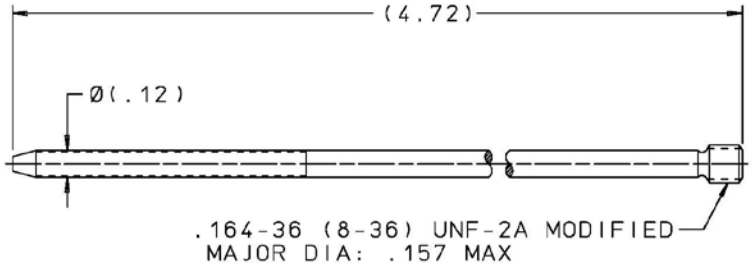
THE LEE COMPANY
WESTBROOK, CT 06498

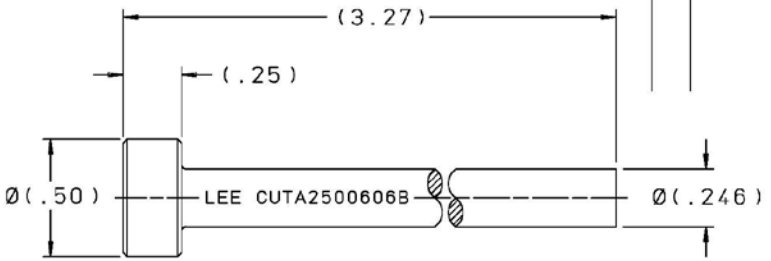
SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA2500506C	B

DWG SCALE: NONE | SHEET 1 OF 1

CUTA2500606B

REV	DATE	BY	DESCRIPTION
A	03-27-89	E D	INITIAL RELEASE
B	09-06-90	GMR	4.72 WAS 2.62, 3.27 WAS 1.17, ADDED MODIFIED MAJOR DIA TO THREAD. ADDED REV LTR TO MARKING.
2	08-13-10	KD	UPDATED PULL SHAFT, (4.72) WAS 4.72 & Ø(.12) WAS Ø.12. JACKING TOOL SLEEVE, REMOVED REV LETTER FROM MARKING. (3.27) WAS 3.27 (.25) WAS .25, Ø(.50) WAS Ø.50, Ø(.246) WAS Ø.246.





INSTRUCTIONS FOR LEE RIVET TYPE JACKING TOOL:

1. THREAD THE STUD INTO THE PIN TO BE REMOVED. 2 FULL TURNS MINIMUM.
2. SLIDE THE SLEEVE DOWN OVER THE STUD UNTIL IT IS SEATED AGAINST THE END OF THE BODY.
3. ENGAGE THE GROOVED END OF THE STUD INTO THE RIVET TOOL. ALLOW SOME SPACE BETWEEN THE GUN AND THE END OF THE SLEEVE. SQUEEZE THE HANDLE UNTIL THE PIN IS FREE.

NOTES:
1. FOR USE WITH LEE RIVET TOOL PART NUMBER CUTA1870504B.
2. USE IN ACCORDANCE WITH LEE COMPANY PROCESS SPECIFICATION 187.
3. USE TO EXTRACT PINS FROM THE FOLLOWING LEE COMPANY PRODUCT: .250 -.260 LEE CHEK LO-LOHM CKF/CKR ONLY.

CUTD0473400
REFERENCE

DWG NO: CUTA2500606B

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:
SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES
TOLERANCES
2 PLACES ±.015 | 3 PLACES ±.005 | ANGLES ±5°

DRAWN BY:	E D	03-27-89
CHKD BY:	B M	06-08-89
APPD BY:	JCD	06-08-89
MAT:		
H.T.:		
FINISH:		

LEE JACKING TOOL SET
.250 X .164-36

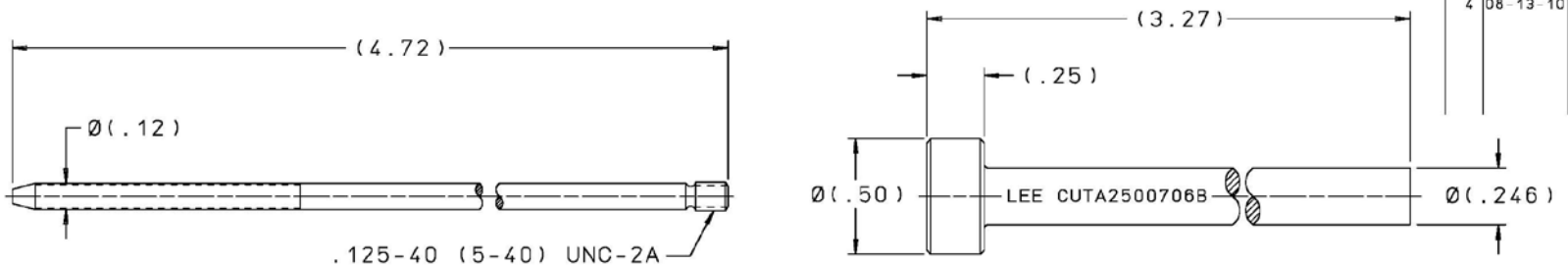
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA2500606B	B

DWG SCALE: NONE | SHEET 1 OF 1

CUTA2500706B

REV	DATE	BY	DESCRIPTION
A	12-09-88	SE	INITIAL RELEASE
B	06-06-89	KT	PART NO. WAS CUTA2500306B.
C	09-13-90	GR	3.27 WAS 1.17, 4.72 WAS 2.62. ADDED NOTE 1 & REV LTR TO MARK
2	06-09-95	BR	REMOVED REV LETTER FROM MARKING.
3	04-15-09	KD	CORRECTED PULL SHAFT & MARKING ON JACKING TOOL SLEEVE.
4	08-13-10	KD	UPDATED PULL SHAFT, (4.72) WAS 4.72 & Ø(.12) WAS Ø.12. JACKING TOOL SLEEVE, (3.27) WAS 3.27 (.25) WAS .25. Ø(.50) WAS Ø.50, Ø(.246) WAS Ø.246.



INSTRUCTIONS FOR LEE RIVET TYPE JACKING TOOL:

1. THREAD THE STUD INTO THE PIN TO BE REMOVED. 2 FULL TURNS MINIMUM.
2. SLIDE THE SLEEVE DOWN OVER THE STUD UNTIL IT IS SEATED AGAINST THE END OF THE BODY.
3. ENGAGE THE GROOVED END OF THE STUD INTO THE RIVET TOOL. ALLOW SOME SPACE BETWEEN THE GUN AND THE END OF THE SLEEVE. SQUEEZE THE HANDLE UNTIL THE PIN IS FREE.

NOTES:
1. FOR USE WITH LEE RIVET TOOL PART NUMBER CUTA1870504B.
2. USE IN ACCORDANCE WITH LEE COMPANY PROCESS SPECIFICATION 187.
3. USE TO EXTRACT PINS FROM THE FOLLOWING LEE COMPANY PRODUCTS: .250-.260 LEE AXIAL VISCO JET, VXC 2500 AND 2501 ONLY

CUTD0473050
REFERENCE

DWG NO: CUTA2500706B

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	S E	12-09-88
CHK'D BY:	B M	03-01-89
APP'D BY:	JCD	03-01-89
MAT:		
H.T.:		
FINISH:		

LEE JACKING TOOL SET
.250 X .125-40

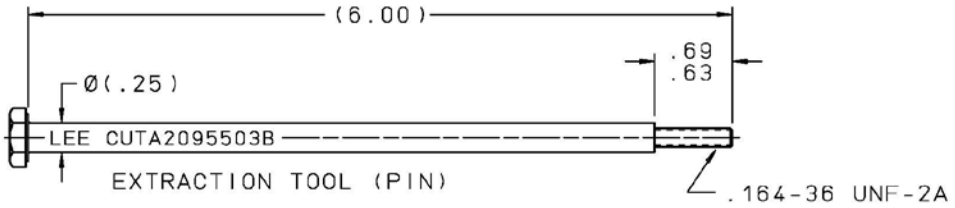
THE LEE COMPANY
WESTBROOK, CT 06498

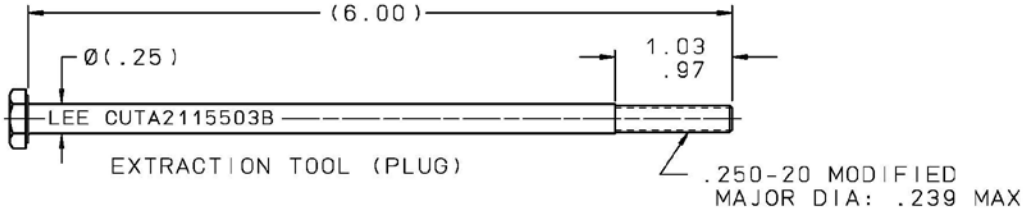
SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA2500706B	C

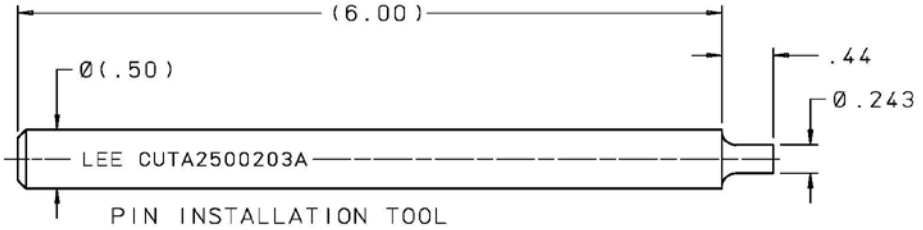
DWG SCALE: NONE SHEET 1 OF 1

CUTA2500801C

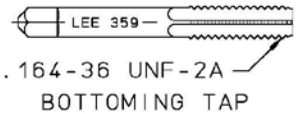
REV	DATE	BY	DESCRIPTION
A2	06-30-04	KD	REMOVED REV LETTER FROM MARKINGS.
3	07-29-10	KD	EXTR TOOL (PIN),UPDATED HEX.EXTR TOOL (PLUG),UPDATED HEX & 1.03-.97 WAS 1.035-.965. PIN INST TOOL, Ø(.50) WAS Ø.50,.44 WAS (.44).STRIKER: Ø(1.50) WAS Ø1.50 & (1.25) WAS 1.25.



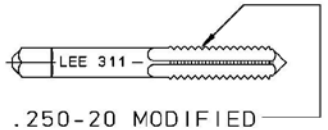




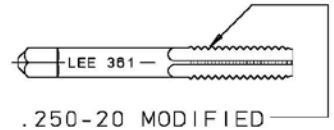
STARTER TAP
(CUTA3095503B)



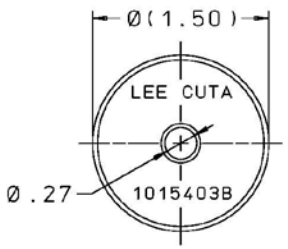
BOTTOMING TAP
(CUTA3595503B)

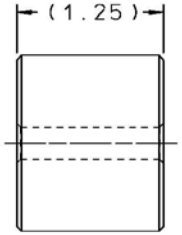


STARTER TAP
(CUTA3115503B)



BOTTOMING TAP
(CUTA3615503B)





STRIKER

INSTALLATION AND EXTRACTION SET FOR:
LEE .250-.260 JELA
LEE .250-.260 JEPA

PROPRIETARY ITEM

This document contains proprietary information and is submitted upon the express condition that the information contained herein will not be used directly or indirectly in any way detrimental to the interests of The Lee Company, and/or in violation of regulation DAR 7-104.9(a)(1 July 1974), et seq.

CUTD0105670
REFERENCE

DWG NO: CUTA2500801C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY. ALL MANUFACTURING RIGHTS RESERVED.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	B R	11-01-95
CHK'D BY:	L B	11-03-95
APP'D BY:	B B	11-07-95
MAT:		
H.T.:		
FINISH:		

LEE TOOL SET
INSTALLATION AND EXTRACTION

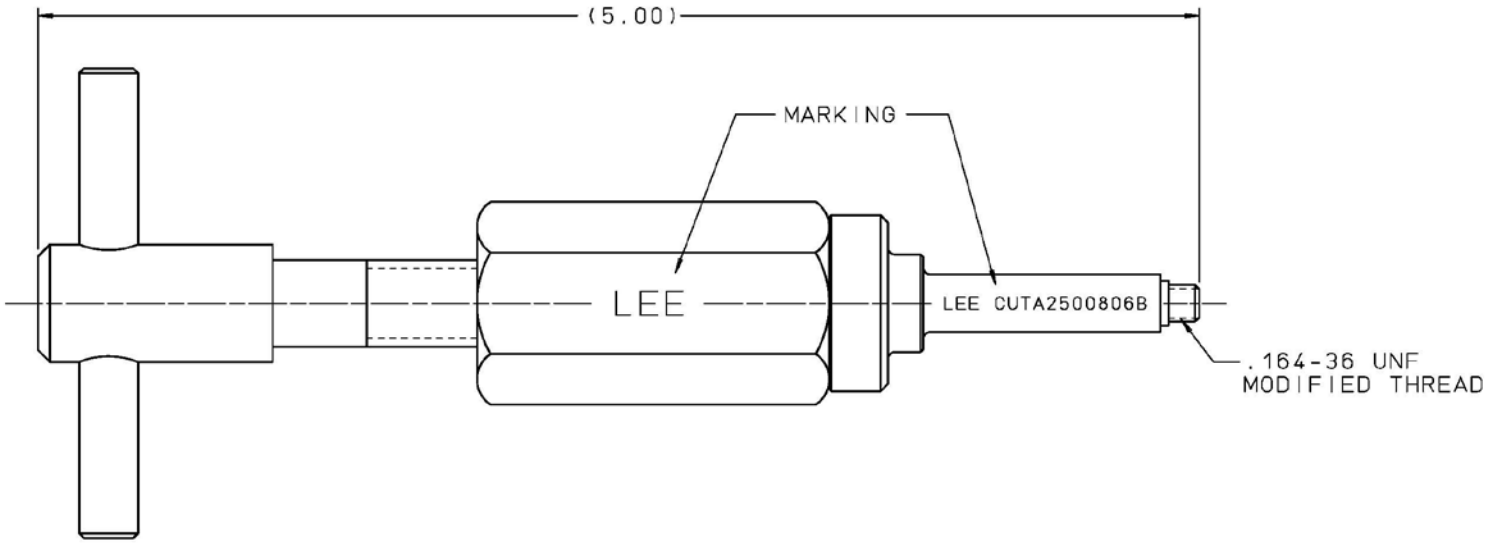
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA2500801C	A

DWG SCALE: NONE SHEET 1 OF 1

CUTA2500806B

REV	DATE	BY	DESCRIPTION
A	07-23-99	HM	INITIAL RELEASE



PROPRIETARY ITEM

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CUTD0472140

REFERENCE

DWG NO: CUTA2500806B

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	H M	07-23-99
CHKD BY:	L B	07-27-99
APPD BY:	B B	07-28-99
MAT:		
H.T.:		
FINISH:		

LEE JACKING TOOL

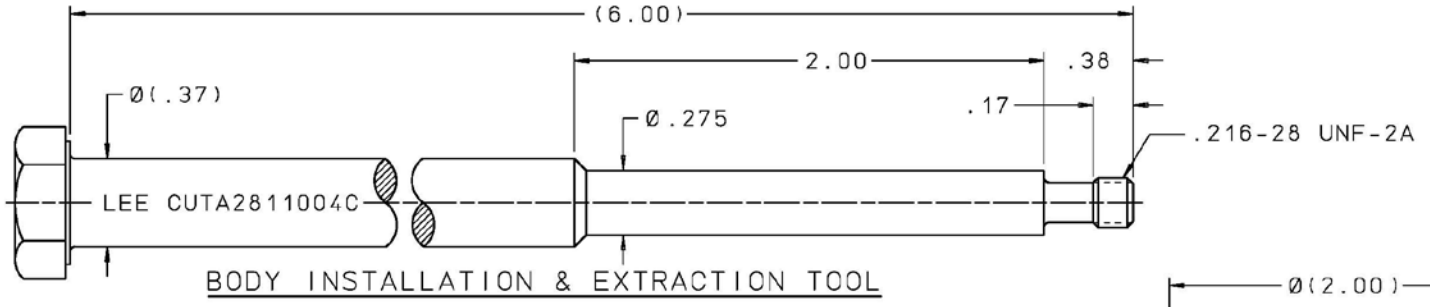
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA2500806B	A

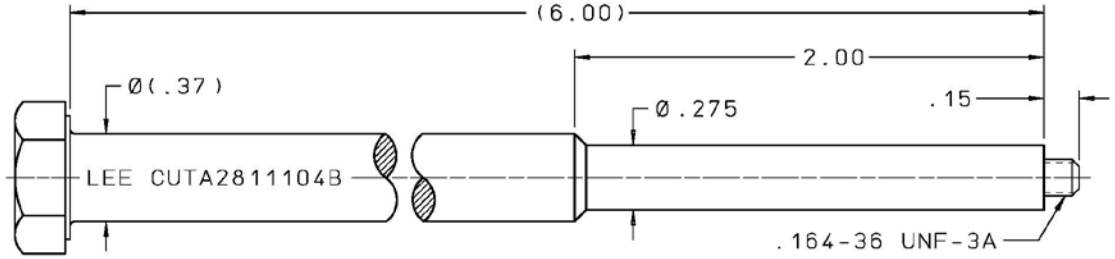
DWG SCALE: NONE SHEET 1 OF 1

CUTA2810104C

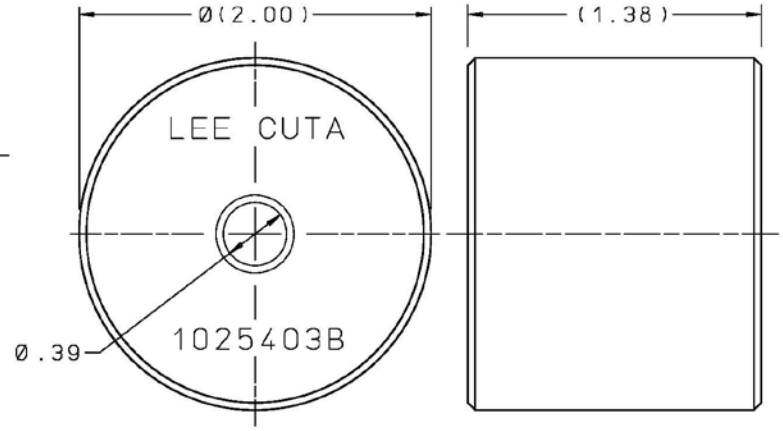
REV	DATE	BY	DESCRIPTION
A	07-10-91	GMR	INITIAL RELEASE
2	05-06-10	KD	DELETED REV LETTERS FROM MARKINGS, BODY TOOL, PIN EXTRACTION PIN INSTALLATION TOOL & STRIKER.



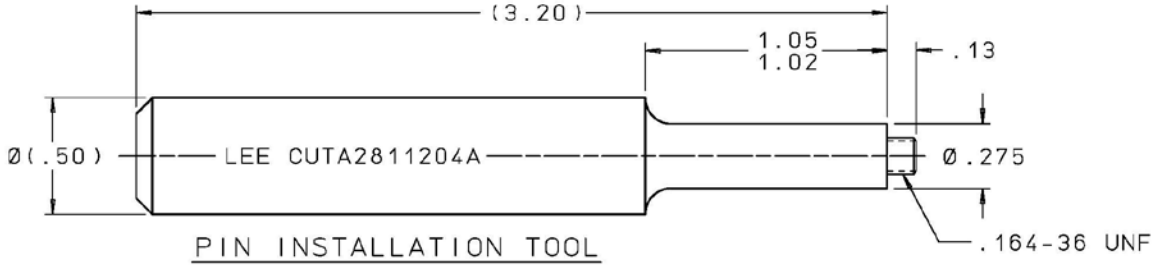
BODY INSTALLATION & EXTRACTION TOOL



PIN EXTRACTION TOOL



STRIKER



PIN INSTALLATION TOOL

INSTALLATION AND EXTRACTION SET FOR:
LEE .281/.291 KILOWATT JET

PROPRIETARY ITEM

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CUTD0105200
REFERENCE

DWG NO: CUTA2810104C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH ✓ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

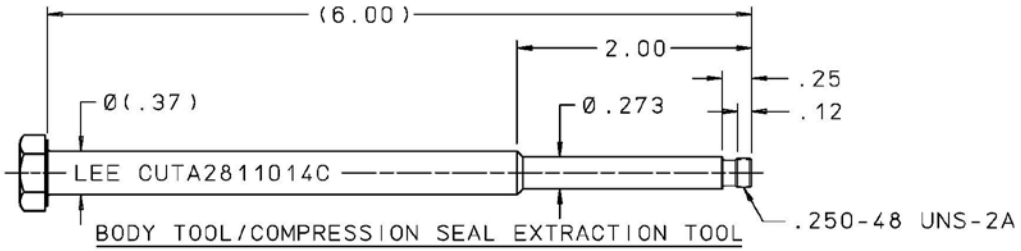
DRAWN BY:	GMR	07-10-91	LEE TOOL SET INSTALLATION AND EXTRACTION
CHKD BY:	P C	07-17-91	
APPD BY:	JCD	07-17-91	THE LEE COMPANY WESTBROOK, CT 06498
MAT:			
H.T.:			
FINISH:			

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA2810104C	A

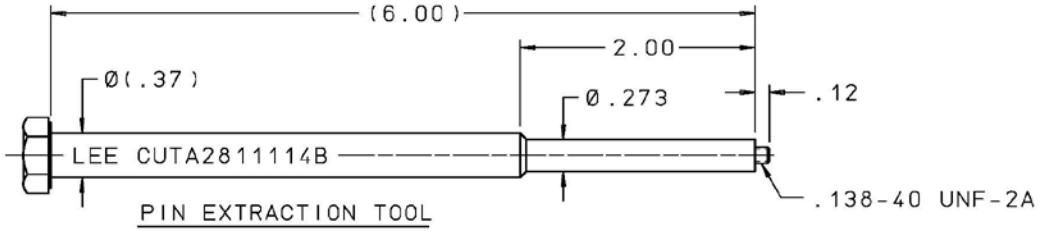
DWG SCALE: NONE SHEET 1 OF 1

CUTA2810114C

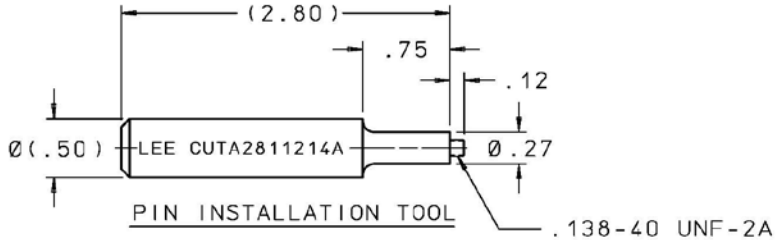
REV	DATE	BY	DESCRIPTION
J2	02-17-05	HM	REMOVED REV LETTER FROM MARKINGS.
3	01-22-09	KD	ADDED .75 & Ø.27 TO PIN INST TOOL. CORRECTED BODY & PIN EXTRACTION TOOL.
4	08-03-10	KD	BODY/COMP SEAL EXTR TOOL, ADDED Ø(.37). (6.00) WAS 6.00. PIN EXTR TOOL,ADDED Ø(.37). (6.00) WAS 6.00. UPDATED HEX. PIN INST TOOL;Ø(.50) WAS Ø.50 & (2.80) WAS 2.80. STRIKER, Ø(2.00) WAS Ø2.00 (1.38) WAS 1.38.



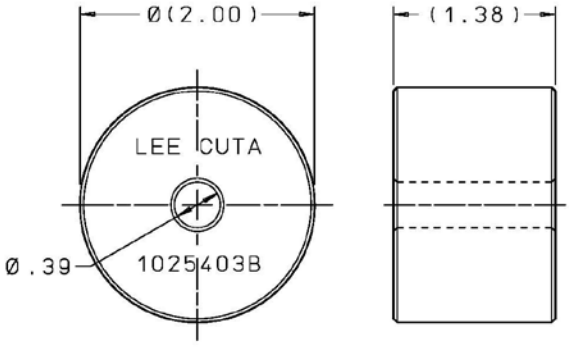
BODY TOOL/COMPRESSION SEAL EXTRACTION TOOL



PIN EXTRACTION TOOL



PIN INSTALLATION TOOL



STRIKER

INSTALLATION AND EXTRACTION SET FOR:
.281 - .291 LEE FLOSERT
.281 - .291 LEE P.R.I.
.281 - .291 LEE FLOW CONTROL

PROPRIETARY ITEM

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CUTD0101250
REFERENCE

DWG NO: CUTA2810114C

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH ✓ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	E B	05-19-70
CHKD BY:	H R	05-22-70
APPD BY:	G L	
MAT:		
H.T.:		
FINISH:		

LEE TOOL SET
INSTALLATION AND EXTRACTION

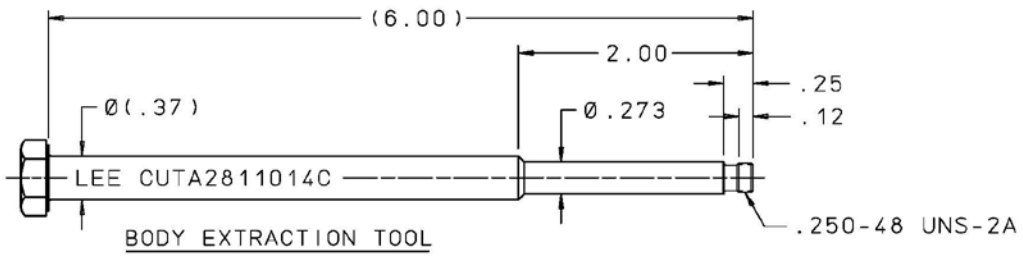
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA2810114C	J

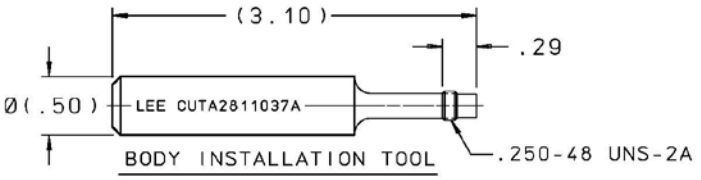
DWG SCALE: NONE SHEET 1 OF 1

CUTA2810137C

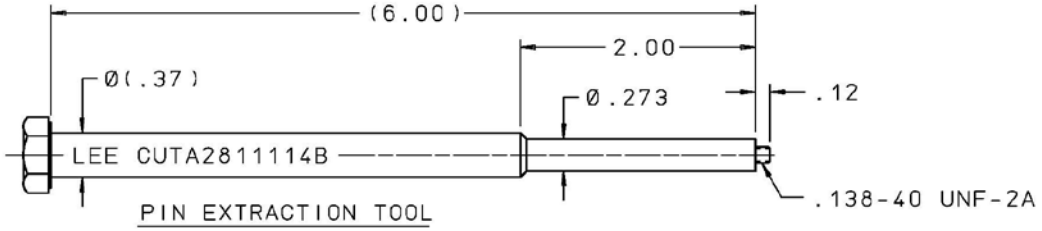
REV	DATE	BY	DESCRIPTION
B2	06-22-10	KD	REMOVED REV LETTER FROM MARKINGS.



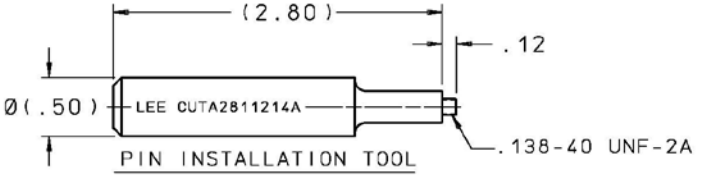
BODY EXTRACTION TOOL



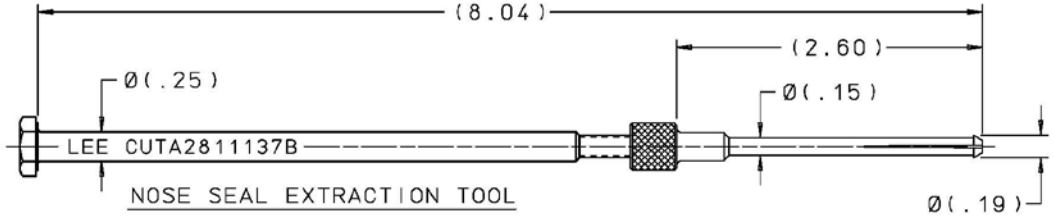
BODY INSTALLATION TOOL



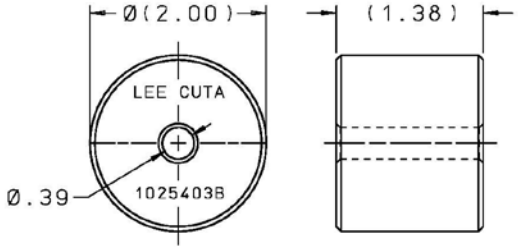
PIN EXTRACTION TOOL



PIN INSTALLATION TOOL



NOSE SEAL EXTRACTION TOOL



STRIKER

INSTALLATION AND EXTRACTION SET FOR:
LEE .281/.291 SHUTTLE VALVE

PROPRIETARY ITEM

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CUTD0105290
REFERENCE

DWG NO: CUTA2810137C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:
SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES
TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	KCT	07-07-89
CHKD BY:	P C	07-11-89
APPD BY:	JCD	07-20-89
MAT:		
H.T.:		
FINISH:		

LEE INSTALLATION/EXTRACTION TOOL SET

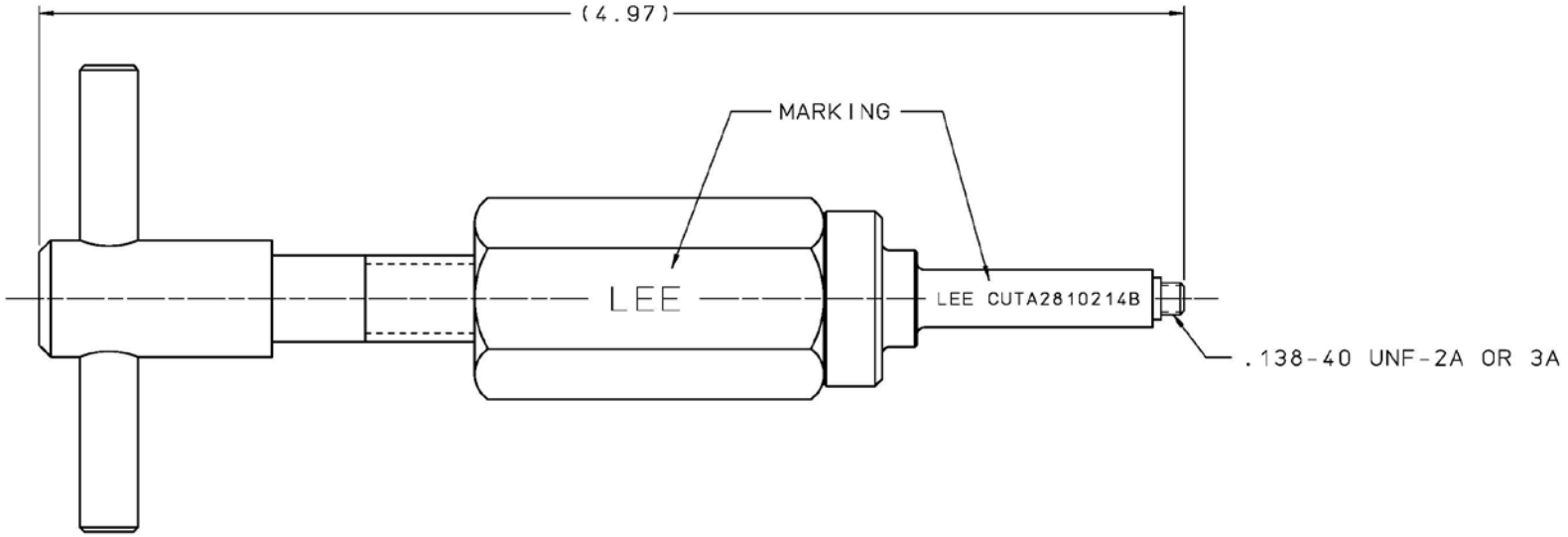
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA2810137C	B

DWG SCALE: NONE SHEET 1 OF 1

CUTA2810214B

REV	DATE	BY	DESCRIPTION
D	08-04-76	KS	REDRAWN
2	09-26-80	TD	OAL WAS (4.91)
3	12-08-83	TC	MARKING WAS 'LEE CUTA2810214B 6-40'
4	06-18-91	GR	REDRAWN TO CAD
5	11-14-94	BR	MARKING WAS 'LEE CUTA2810214BG'



PROPRIETARY ITEM

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CUTD0472400

REFERENCE

DWG NO: CUTA2810214B

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH ✓ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	KMN	08-07-74
CHKD BY:	ECB	08-22-74
APPD BY:	G L	10-25-74
MAT:		
H.T.:		
FINISH:		

LEE JACKING TOOL

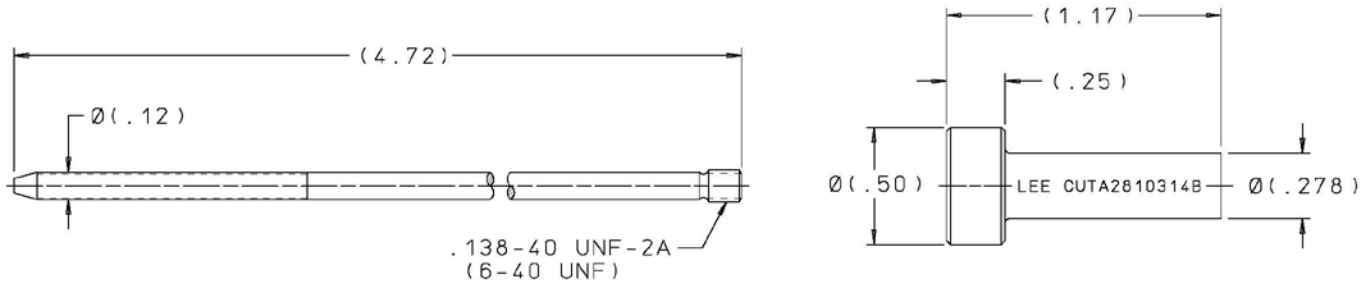
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA2810214B	D

DWG SCALE: NONE SHEET 1 OF 1

CUTA2810314B

REV	DATE	BY	DESCRIPTION
A	12-09-88	SE	INITIAL RELEASE
B	02-25-00	HM	UPDATED PULL SHAFT 4.72 WAS 2.62.
2	08-16-10	KD	ADDED INSTR CARD. PULL SHAFT; Ø(.12) WAS Ø.12. JACKING TOOL SLEEVE; (.25) WAS .25, Ø(.50) WAS Ø.50, Ø(.278) WAS Ø.278.



INSTRUCTIONS FOR LEE RIVET TYPE JACKING TOOL:

1. THREAD THE STUD INTO THE PIN TO BE REMOVED. 2 FULL TURNS MINIMUM.
2. SLIDE THE SLEEVE DOWN OVER THE STUD UNTIL IT IS SEATED AGAINST THE END OF THE BODY.
3. ENGAGE THE GROOVED END OF THE STUD INTO THE RIVET TOOL. ALLOW SOME SPACE BETWEEN THE GUN AND THE END OF THE SLEEVE. SQUEEZE THE HANDLE UNTIL THE PIN IS FREE.

NOTES:
1. USE IN ACCORDANCE WITH LEE COMPANY PROCESS SPECIFICATION PS 187.
2. USE TO EXTRACT PINS FROM THE FOLLOWING LEE COMPANY PRODUCTS:
   .281-.291 LEE FLOSERT, FLF/FLR ONLY.
   .281-.291 LEE PRI, PRF/PRR ONLY.

CUTD0473150
REFERENCE

DWG NO. CUTA2810314B

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY. ALL MANUFACTURING RIGHTS RESERVED.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	S E	12-09-88
CHK'D BY:	B M	03-01-89
APP'D BY:	JCD	03-01-89
MAT:		
H.T.:		
FINISH:		

LEE JACKING TOOL SET
.281 X .138-40

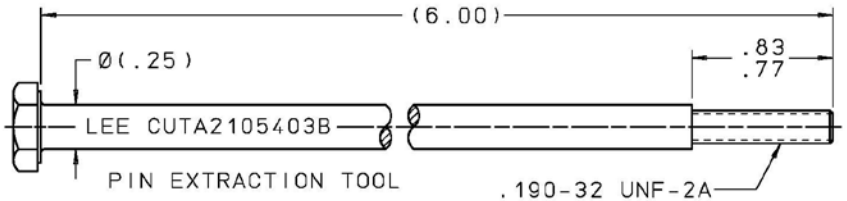
THE LEE COMPANY
WESTBROOK, CT 06498

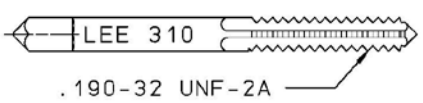
SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA2810314B	B

DWG SCALE: NONE SHEET 1 OF 1

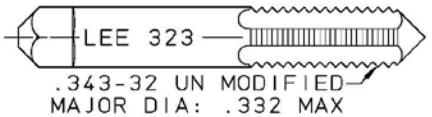
CUTA3430801C

REV	DATE	BY	DESCRIPTION
A	11-01-95	BR	INITIAL RELEASE
B	05-24-10	KD	DELETED REV LETTERS FROM MARKINGS, PIN EXTR TOOL, BODY EXTR TOOL AND STRIKER. UPDATED CUTA3430203A

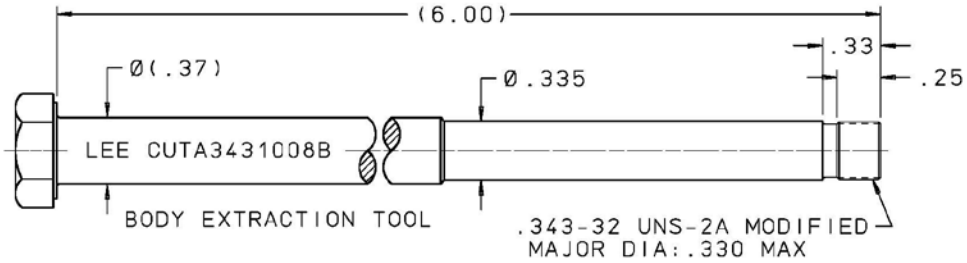


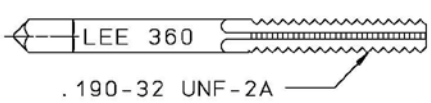


STARTER TAP
(CUTA3105403B)

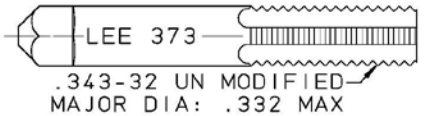


STARTER TAP
(CUTA3235503B)

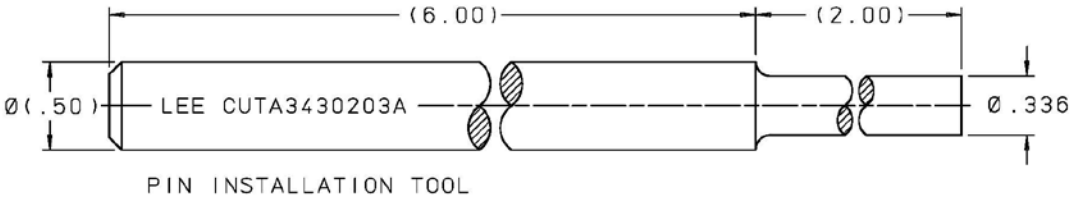


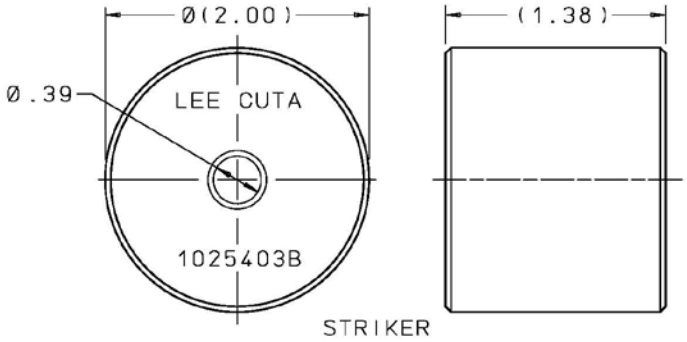


BOTTOMING TAP
(CUTA3605403B)



BOTTOMING TAP
(CUTA3735503B)





INSTALLATION/EXTRACTION TOOL SET FOR:
.343-.353 LEE LUBRICATION JET

PROPRIETARY ITEM

This document contains proprietary information and is submitted upon the express condition that the information contained herein will not be used directly or indirectly in any way detrimental to the interests of The Lee Company, and/or in violation of regulation DAR 7-104.9(a)(1 July 1974), et seq.

CUTD0105680
REFERENCE

DWG NO: CUTA3430801C

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH ✓ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 | 3 PLACES ±.005 | ANGLES ±5°

DRAWN BY:	B R	11-01-95
CHKD BY:	L B	11-03-95
APPD BY:	B B	11-07-95
MAT:		
H.T.:		
FINISH:		

LEE INSTALLATION/EXTRACTION TOOL SET

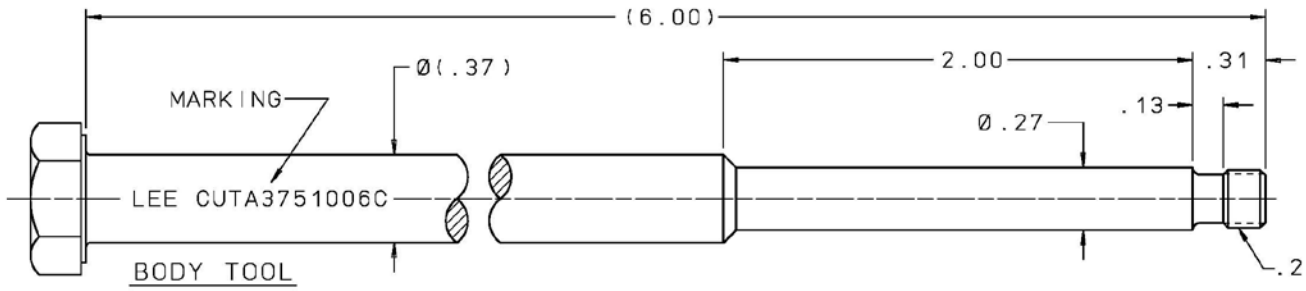
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA3430801C	B

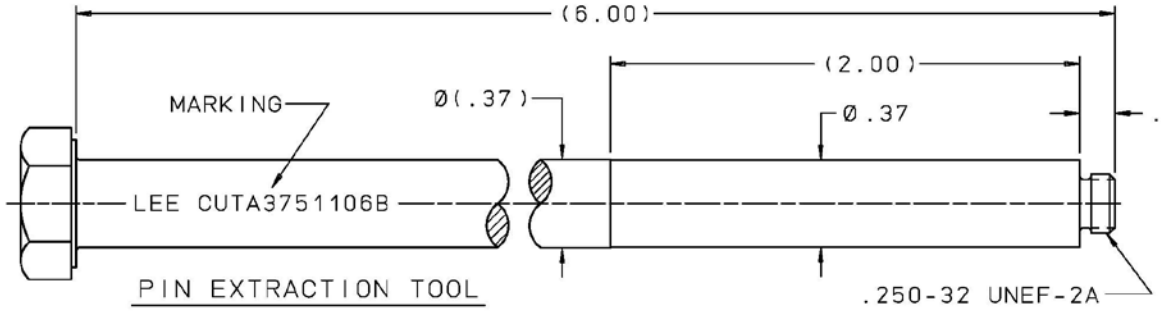
DWG SCALE: NONE | SHEET 1 OF 1

CUTA3750106C

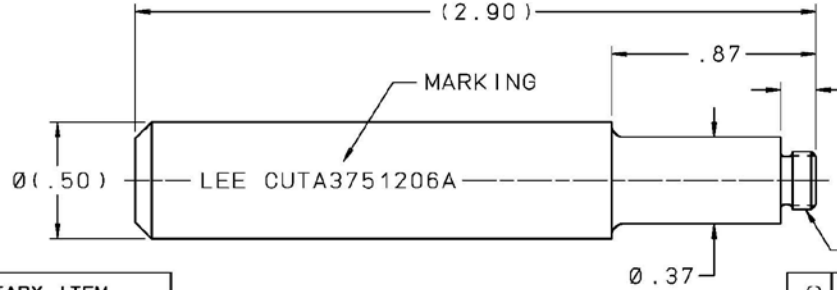
REV	DATE	BY	DESCRIPTION
K4	06-09-04	KD	REMOVED REV LETTERS
5	05-14-10	KD	UPDATED DIMENSIONS; BODY TOOL, ADDED 2.00 .31, .13 & Ø(.37)WAS Ø.37. PIN EXTRACTION ADDED Ø(.375), (2.00) & .150. PIN INSTALLATION, ADDED .150 & .87, (2.80) WAS 2.80 & Ø(.50) WAS Ø.50. STRIKER, Ø(2.00) WAS Ø2.00 & (1.38) WAS 1.38



BODY TOOL



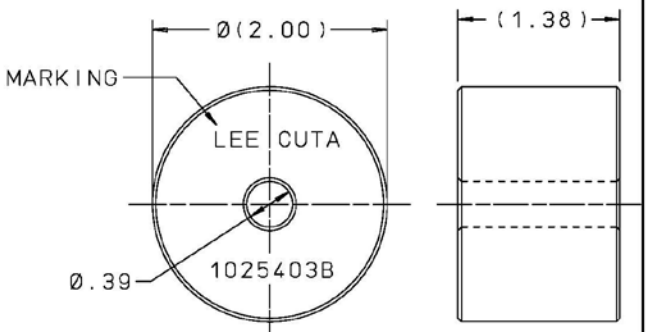
PIN EXTRACTION TOOL



PIN INSTALLATION TOOL

INSTALLATION AND EXTRACTION SET FOR:

.375 LEE FLOW CONTROL
.375 LEE LO-LOHM CHEK
.375 LEE PRI (FORWARD)



STRIKER

PROPRIETARY ITEM

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CUTD0101300
REFERENCE

DWG NO: CUTA3750106C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY. ALL MANUFACTURING RIGHTS RESERVED.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH ✓ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 | 3 PLACES ±.005 | ANGLES ±5°

DRAWN BY:	E D	12-03-73
CHKD BY:	E B	12-17-73
APPD BY:	G L	01-04-74
MAT:		
H.T.:		
FINISH:		

LEE TOOL SET INSTALLATION AND EXTRACTION .375 CHEK

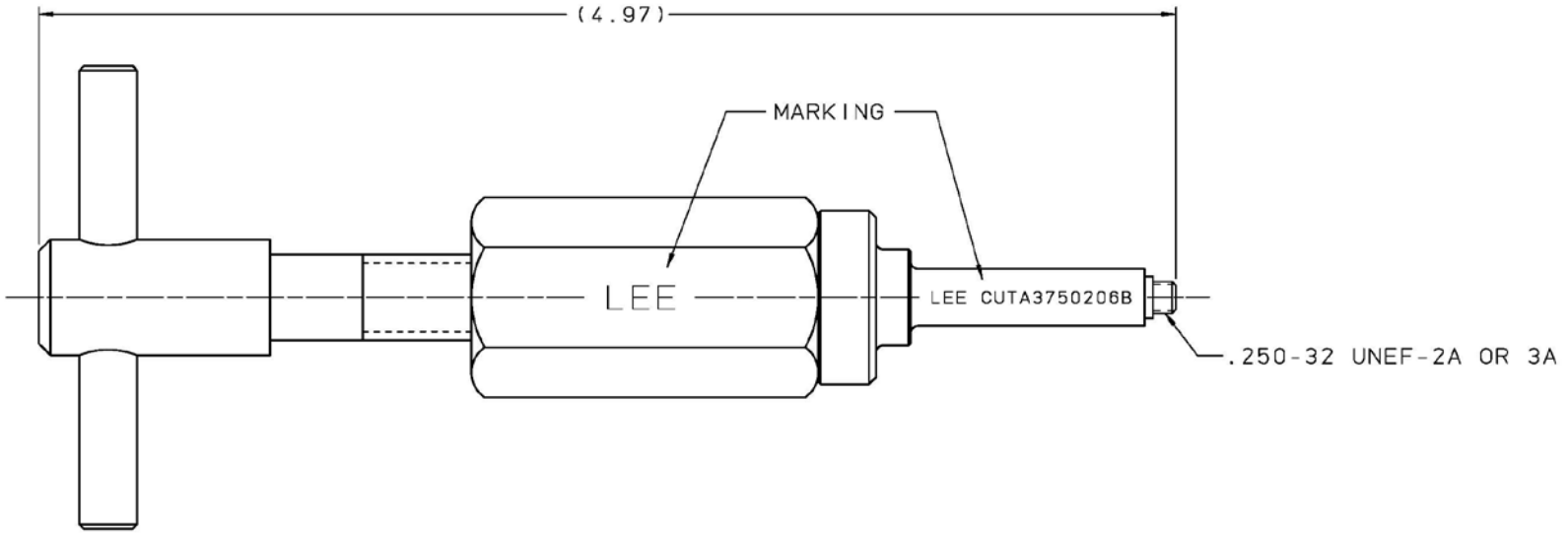
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA3750106C	K

DWG SCALE: NONE | SHEET 1 OF 1

CUTA3750206B

REV	DATE	BY	DESCRIPTION
B	09-10-76	KS	DWG NO. WAS CUTX-0472300A
2	09-29-80	TD	OAL WAS (4.91)
3	06-13-91	GR	MARKING WAS 'LEE CUTA2000213B 5-40'
4	11-14-94	BR	MARKING WAS 'LEE CUTA2000213BD'



PROPRIETARY ITEM

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CUTD0472500
REFERENCE

DWG NO. CUTA3750206B

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:
SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES
TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	KMN	08-06-74
CHK'D BY:	ECB	08-21-74
APP'D BY:	G L	10-25-74
MAT:		
H.T.:		
FINISH:		

LEE JACKING TOOL

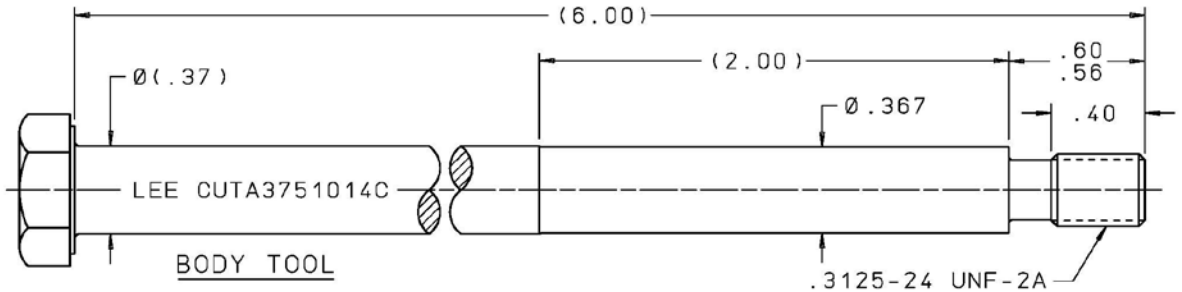
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA3750206B	B

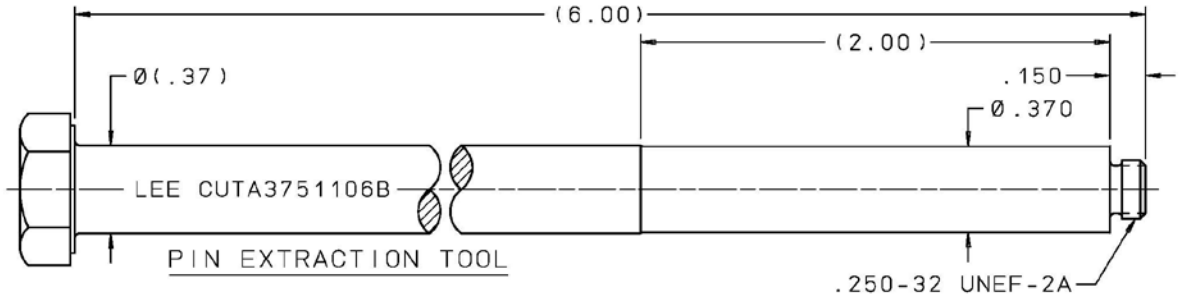
DWG SCALE: NONE SHEET 1 OF 1

CUTA3750114C

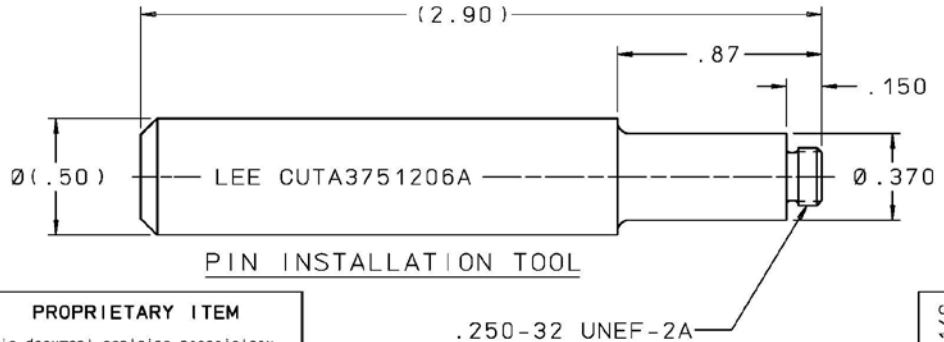
REV	DATE	BY	DESCRIPTION
A3	06-16-10	KD	BODY TOOL, REMOVED REV LTR FROM MARKING ADDED Ø(.37),(2.00), .60-.56 & .40, Ø.367 WAS Ø.370. PIN EXTR TOOL, REMOVED REV LTR FROM MARKING. ADDED Ø(.37),(2.00), & .150. PIN INST TOOL, REMOVED REV LTR FROM MARKING. ADDED .87 & .150. Ø(.50) WAS Ø.50. (2.90) WAS 2.80. STRIKER, REMOVED REV LTR FROM MARKING. Ø(2.00) WAS Ø2.00 & (1.38) WAS 1.38.



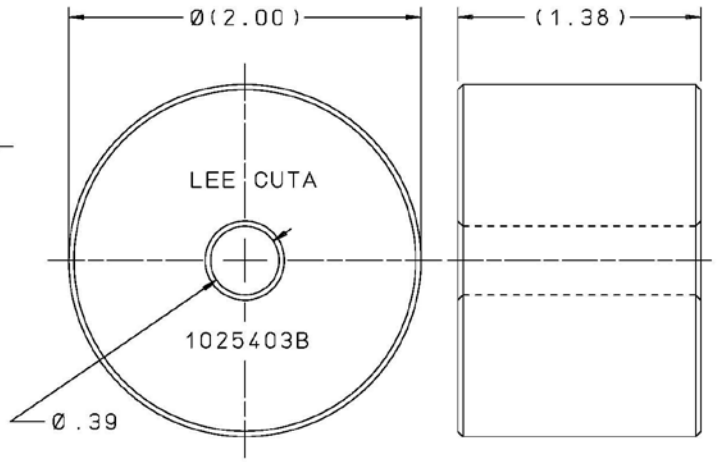
BODY TOOL



PIN EXTRACTION TOOL



PIN INSTALLATION TOOL



STRIKER

INSTALLATION AND EXTRACTION SET FOR:

.375 PRI

CUTD0101530

REFERENCE

DWG NO: CUTA3750114C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	E J	8-25-88
CHK'D BY:	R G	8-29-88
APP'D BY:	JCD	8-29-88
MAT:		
H.T.:		
FINISH:		

LEE TOOL SET INSTALLATION AND EXTRACTION

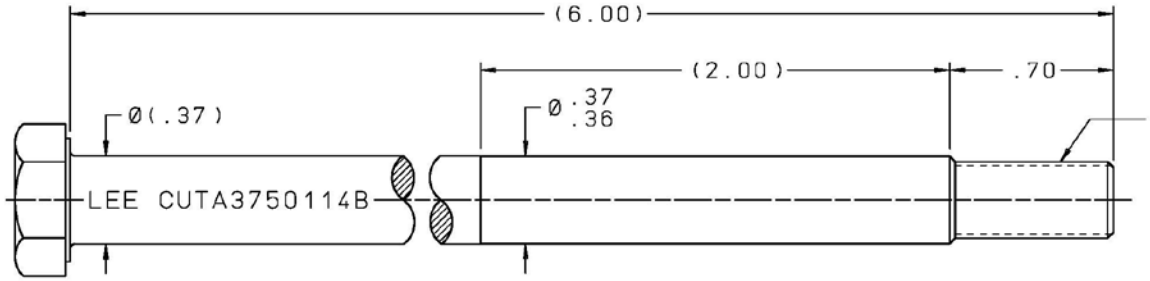
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA3750114C	A

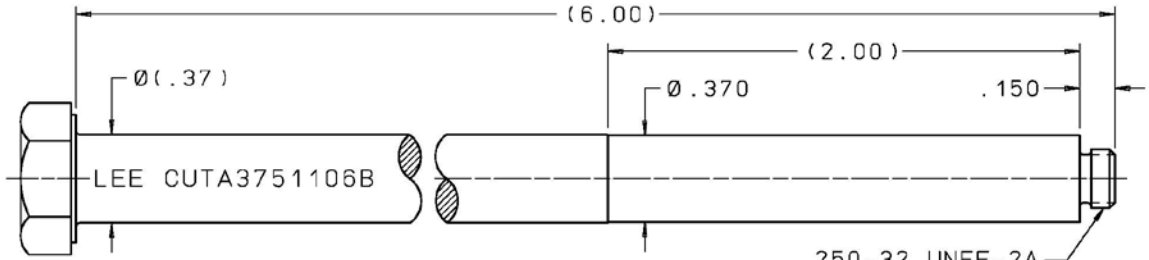
DWG SCALE: NONE SHEET 1 OF 1

CUTA3750214C

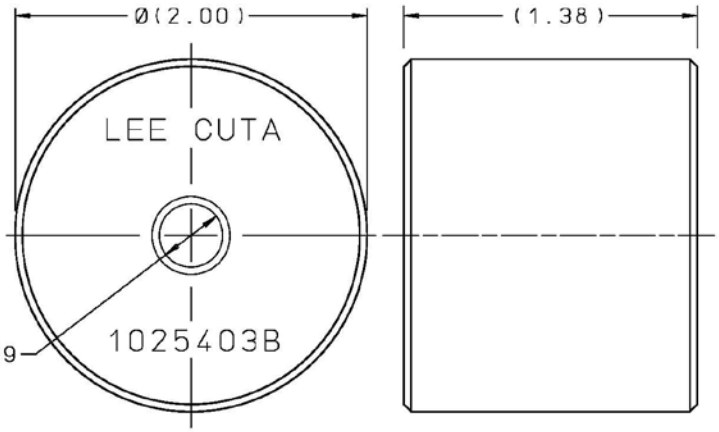
REV	DATE	BY	DESCRIPTION
A	05-04-94	BR	INITIAL RELEASE
2	08-05-10	KD	BODY TOOL: UPDATED HEX, ADDED Ø(.37), (2.00) & .70. Ø.37-.36 WAS Ø.37. PIN EXTR TOOL: UPDATED HEX. ADDED Ø(.37), (2.00) & .150. Ø.370 WAS Ø.37. PIN INST TOOL: ADDED .150. (2.90) WAS 2.80 & Ø(.50) WAS Ø.50. STRIKER: Ø(2.00) WAS Ø2.00 & (1.38) WAS 1.38.



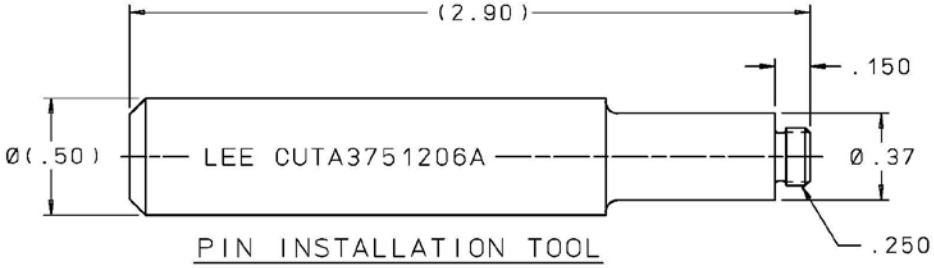
BODY INSTALLATION & EXTRACTION TOOL



PIN EXTRACTION TOOL



STRIKER



PIN INSTALLATION TOOL

INSTALLATION AND EXTRACTION SET FOR:
.375 LEE PRI

PROPRIETARY ITEM

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CUTD0105630
REFERENCE

DWG NO: CUTA3750214C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH ✓ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 | 3 PLACES ±.005 | ANGLES ±5°

DRAWN BY:	B R	04-05-94
CHKD BY:	L B	04-09-94
APPD BY:	B B	04-10-94
MAT:		
H.T.:		
FINISH:		

LEE TOOL SET
INSTALLATION AND EXTRACTION

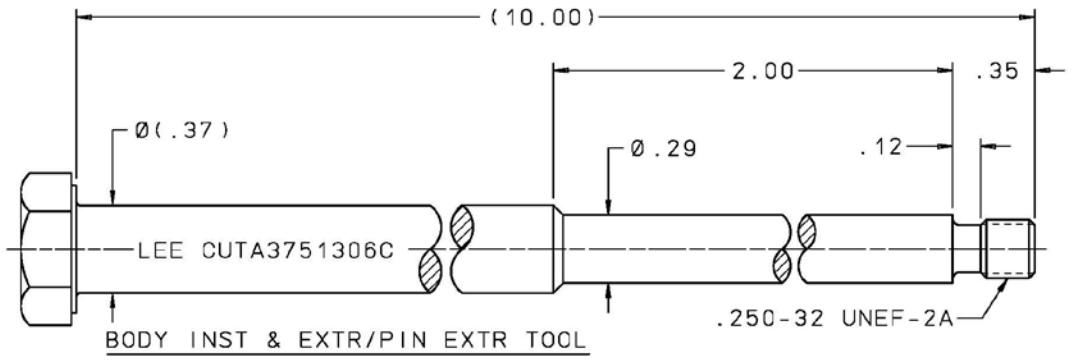
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA3750214C	A

DWG SCALE: NONE | SHEET 1 OF 1

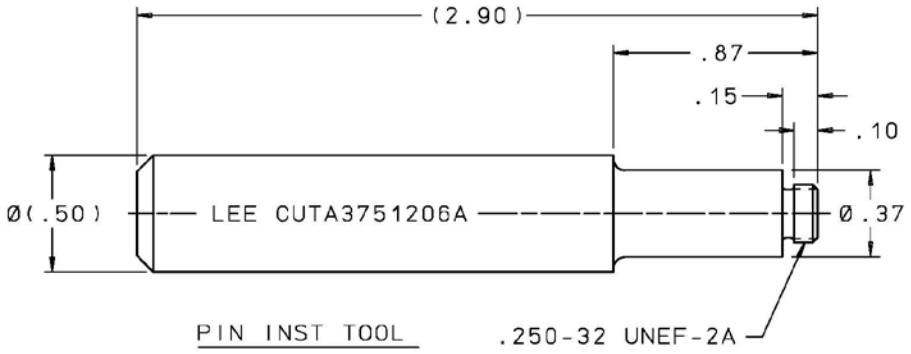
CUTA3750306C

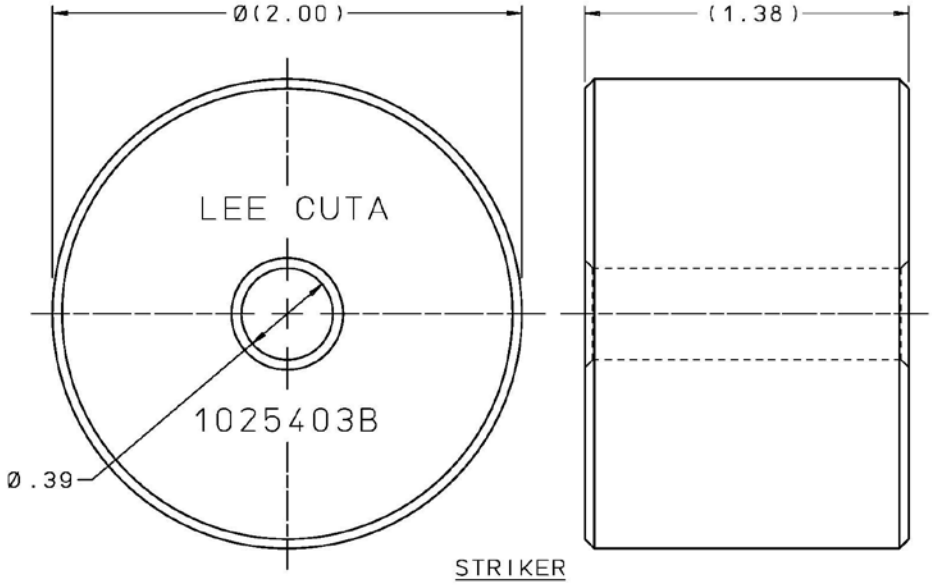
REV	DATE	BY	DESCRIPTION
A	01-08-90	GMR	INITIAL RELEASE
2	05-26-10	KD	DELETED REV LETTERS FROM MARKINGS.



INSTALLATION AND EXTRACTION SET FOR:

.375-.385 LEE HIGH PRESSURE FLOW CONTROL
.375-.385 LEE HIGH PRESSURE CHEK





PROPRIETARY ITEM

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CUTD0101720
REFERENCE

DWG NO: CUTA3750306C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 | 3 PLACES ±.005 | ANGLES ±5°

DRAWN BY:	GMR	01-08-90
CHK'D BY:	P C	01-12-90
APP'D BY:	JCD	01-15-90
MAT:		
H.T.:		
FINISH:		

LEE TOOL SET .375
HIGH PRESSURE CHEK

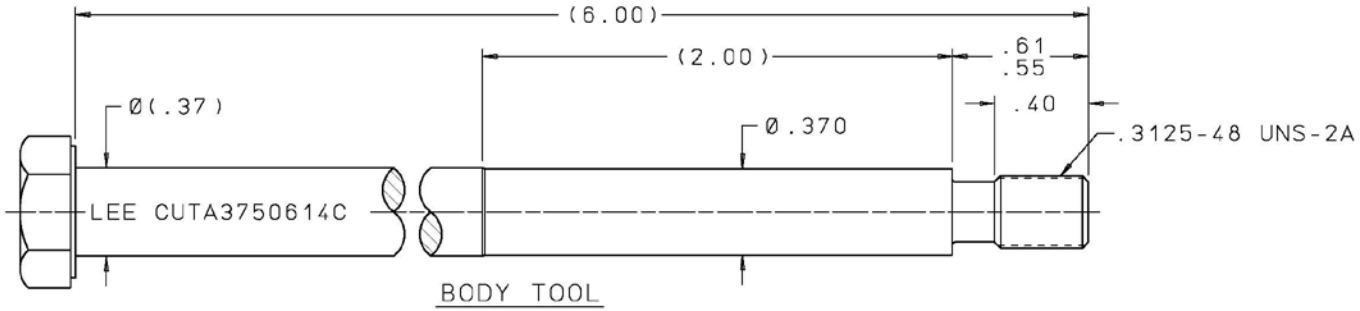
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA3750306C	A

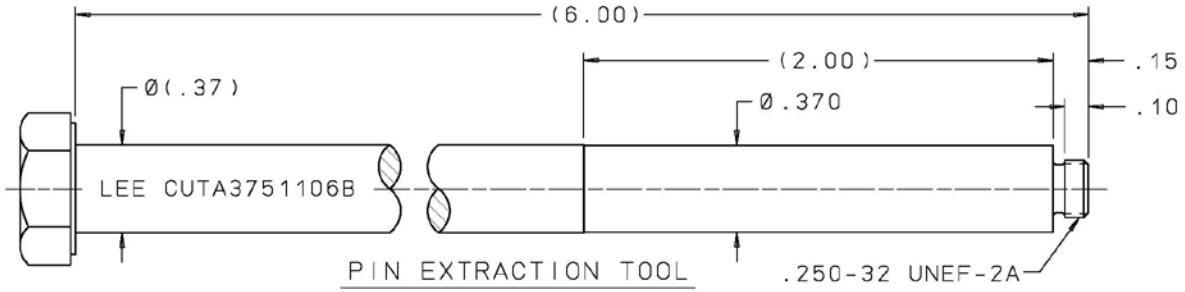
DWG SCALE: NONE | SHEET 1 OF 1

CUTA3750514C

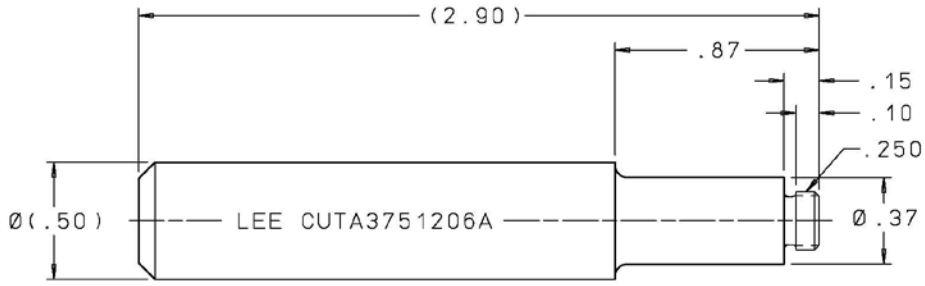
REV	DATE	BY	DESCRIPTION
A	03-15-07	HM	INITIAL RELEASE
2	12-02-10	KD	BODY TOOL, ADDED Ø(.37), (2.00), .40 & .61-.55. PIN EXT TOOL; ADDED Ø(.37) (2.00), .15 & .10 PIN INSTAL TOOL; ADDED .87, .15 &.10 Ø(.50) WAS Ø.50 & Ø.37 WAS Ø.370. STRIKER; Ø(2.00) WAS Ø2.00 & (1.38) WAS 1.38.



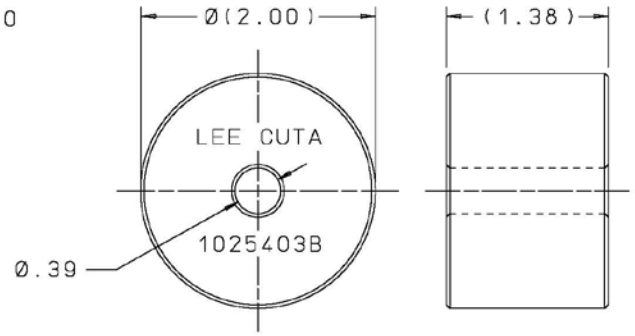
BODY TOOL



PIN EXTRACTION TOOL



PIN INSTALLATION TOOL



STRIKER

INSTALLATION & EXTRACTION SET FOR .375 HI PRESSURE PRI VALVE.

PROPRIETARY ITEM

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CUTD0105640

REFERENCE

DWG NO. CUTA3750514C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY. ALL MANUFACTURING RIGHTS RESERVED.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	H M	03-15-07
CHK'D BY:	DEP	03-20-07
APP'D BY:	B B	03-27-07
MAT:		
H.T.:		
FINISH:		

LEE TOOL SET INSTALLATION & EXTRACTION FOR .375 BODY

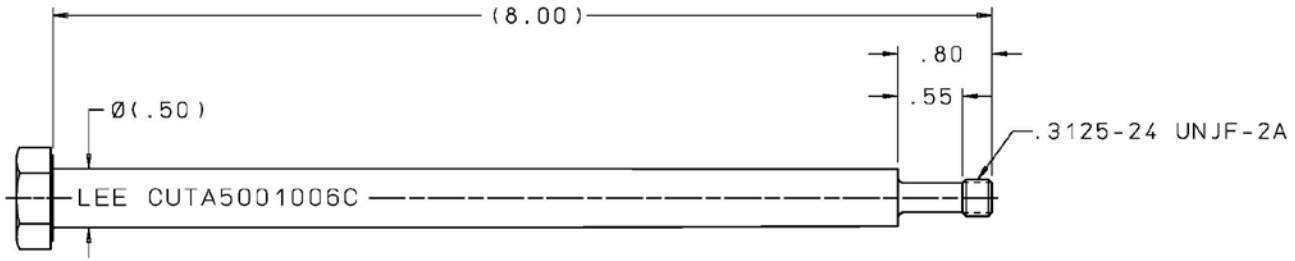
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA3750514C	A

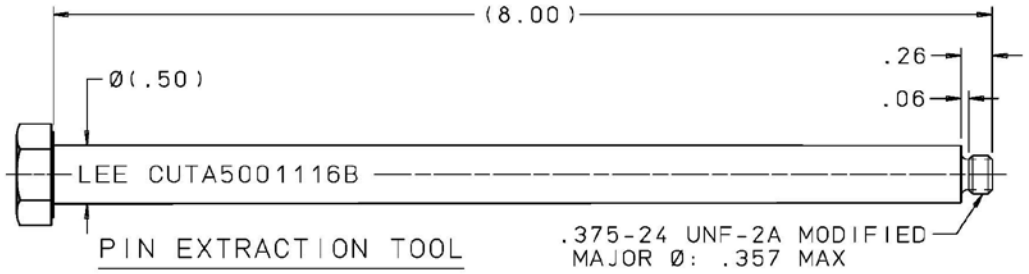
DWG SCALE: NONE SHEET 1 OF 1

CUTA5000106C

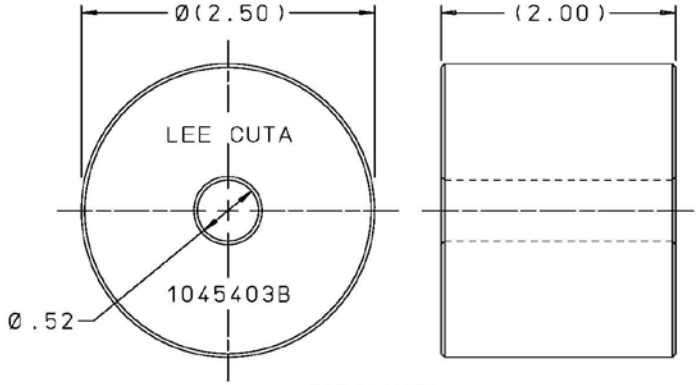
REV	DATE	BY	DESCRIPTION
C2	02-21-02	HM	REMOVED REV LTR FROM MARKINGS. PASSIVATION WAS MIL-S-5002.
3	08-06-10	KD	BODY INST/EXTR TOOL: UPDATED HEX. Ø(.50) WAS Ø(.49). PIN EXTR TOOL: UPDATED HEX. Ø(.50) WAS Ø(.49). PIN INST TOOL:(5.00) WAS 5.00 & Ø(.50) WAS Ø(.49). STRIKER: Ø(2.50) WAS Ø2.50 & (2.00) WAS 2.00. DELETED FINISH: PASSIVATE/ASTM A967



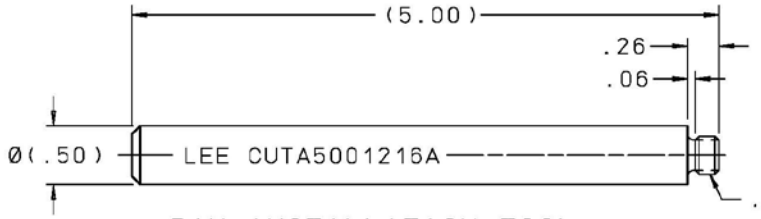
BODY INSTALLATION & EXTRACTION TOOL



PIN EXTRACTION TOOL



STRIKER



PIN INSTALLATION TOOL

INSTALLATION & EXTRACTION TOOL SET FOR:

.500 LEE FLOW CONTROL
.500 LO LOHM CHEK
.500 PRI FORWARD

CUTD0101930
REFERENCE

DWG NO: CUTA5000106C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 | 3 PLACES ±.005 | ANGLES ±5°

DRAWN BY:	E D	06-02-87
CHKD BY:	J B	06-16-87
APPD BY:	SEA	06-17-87
MAT:		
H.T.:		
FINISH:		

LEE TOOL SET
INSTALLATION AND EXTRACTION

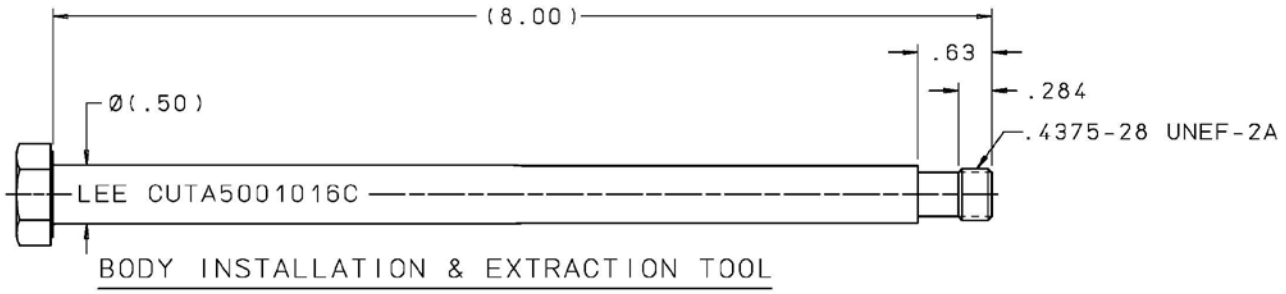
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA5000106C	C

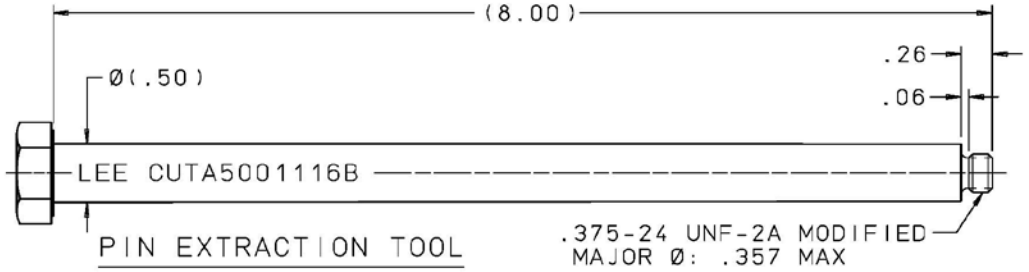
DWG SCALE: NONE | SHEET 1 OF 1

CUTA5000116C

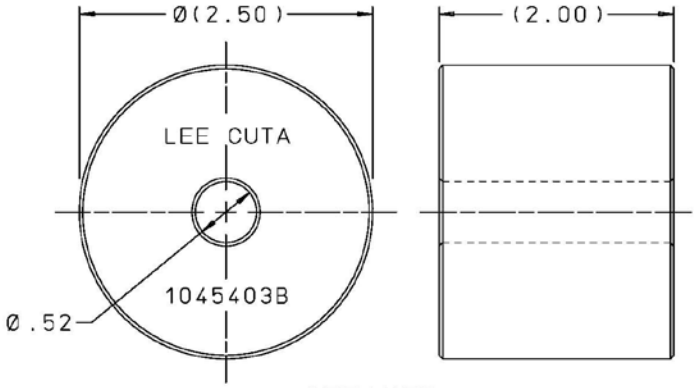
REV	DATE	BY	DESCRIPTION
D	07-10-89	KT	DRAWING WAS A SIZE. RENUMBERED MARKINGS. REMOVED REV LETTER FROM MARKINGS.
2	02-01-96	BR	
3	08-06-10	KD	BODY INST/EXTR TOOL: UPDATED HEX. ADDED .284. DELETED .35. PIN EXTR TOOL: UPDATED HEX.STRIKER: Ø(2.50) WAS Ø2.50 & (2.00) WAS 2.00.



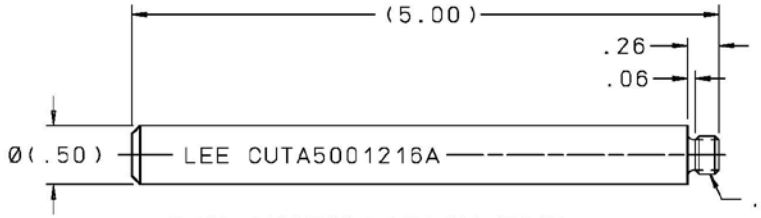
BODY INSTALLATION & EXTRACTION TOOL



PIN EXTRACTION TOOL



STRIKER



PIN INSTALLATION TOOL

INSTALLATION & EXTRACTION TOOL SET FOR:

.500 LEE FLOSERT
.500 PRI REVERSE

CUTD0101750
REFERENCE

DWG NO. CUTA5000116C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 | 3 PLACES ±.005 | ANGLES ±5°

DRAWN BY:	LNJ	04-09-81
CHK'D BY:	MWA	05-11-81
APP'D BY:	SEA	05-28-81
MAT:		
H.T.:		
FINISH:		

LEE TOOL SET
INSTALLATION AND EXTRACTION

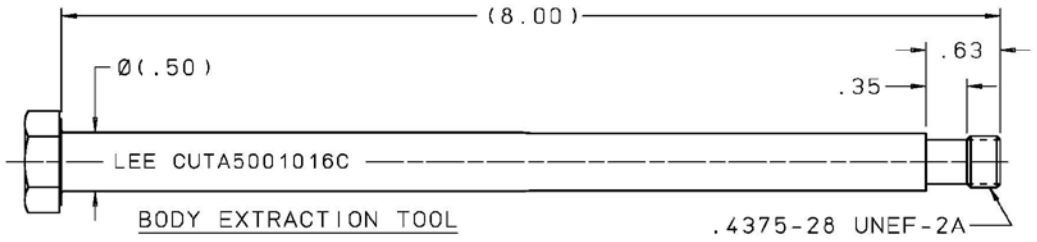
THE LEE COMPANY
WESTBROOK, CT 06498

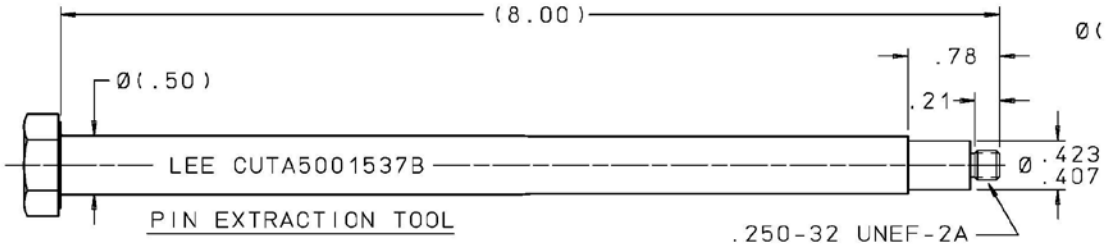
SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA5000116C	D

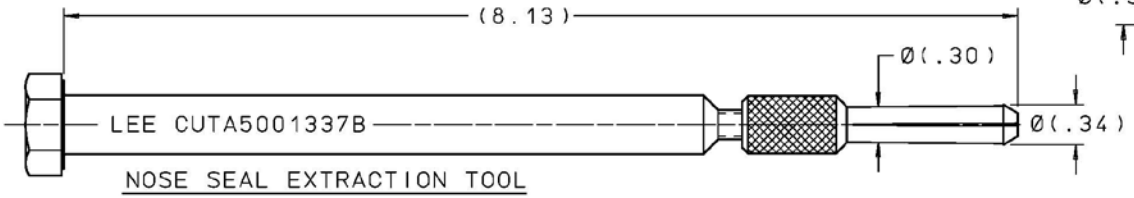
DWG SCALE: NONE | SHEET 1 OF 1

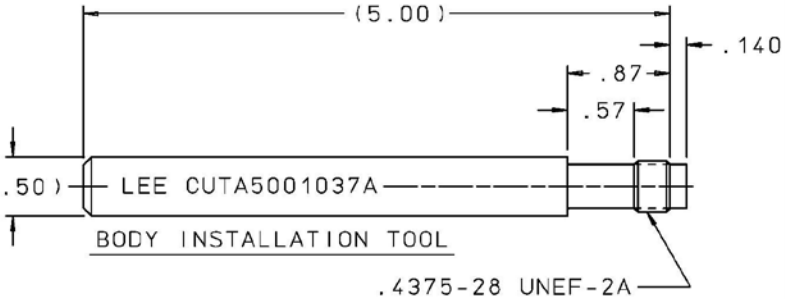
CUTA5000137C

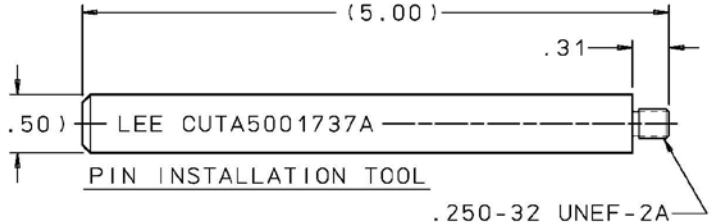
REV	DATE	BY	DESCRIPTION
A	07-27-89	KCT	INITIAL RELEASE
B	10-15-91	GMR	CUTA5001537BA WAS CUTA5001116BA. CUTA5001737AA WAS CUTA5001216AA. DELETED SHEET 2.
2	06-21-10	KD	REMOVED REV LETTER FROM MARKINGS.

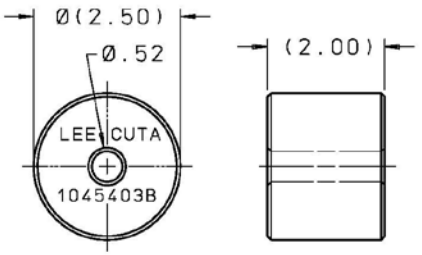












INSTALLATION AND EXTRACTION TOOL SET FOR:

.500 LEE SVBA SHUTTLE VALVE

PROPRIETARY ITEM

This document contains proprietary information and is submitted upon the express condition that the information contained herein will not be used directly or indirectly in any way detrimental to the interests of The Lee Company, and/or in violation of regulation DAR 7-104.9(a)(1 July 1974), et seq.

CUTD0105410
REFERENCE

DWG NO: CUTA5000137C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY. ALL MANUFACTURING RIGHTS RESERVED.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH ✓ ALL OVER
DIMENSIONS ARE IN INCHES
TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	KCT	07-27-89
CHKD BY:	P C	07-31-89
APPD BY:	JCD	08-01-89
MAT:		
H.T.:		
FINISH:		

LEE INSTALLATION AND EXTRACTION TOOL SET

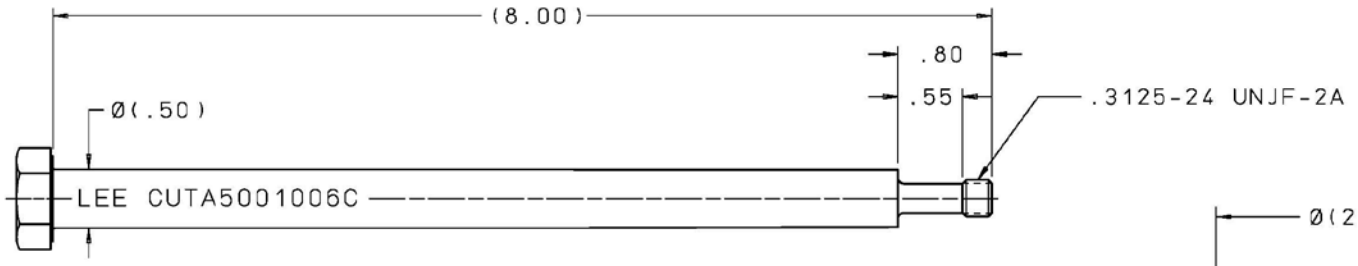
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA5000137C	B

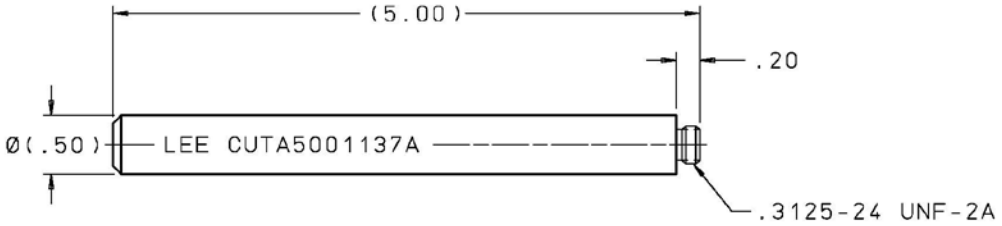
DWG SCALE: NONE SHEET 1 OF 1

CUTA5000206C

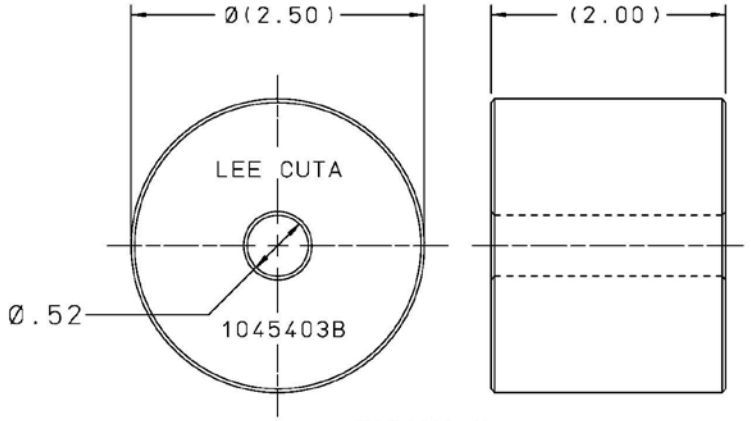
REV	DATE	BY	DESCRIPTION
A	10-01-90	GMR	INITIAL RELEASE
2	02-21-02	HM	REMOVED REV LTR FROM MARKINGS. CORRECTED LENGTH OF PIN EXTR/BODY TOOL.
3	08-06-10	KD	PIN EXTR/BODY TOOL: UPDATED HEX. Ø(.50) WAS Ø(.49). PIN INST TOOL: Ø(.50) WAS Ø.49 & (5.00) WAS 5.00.



PIN EXTRACTION AND BODY TOOL



PIN INSTALLATION TOOL



STRIKER

INSTALLATION AND EXTRACTION TOOL SET FOR:

LEE .500 HIGH PRESSURE CHEK

CUTD0101640

REFERENCE

DWG NO: CUTA5000206C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 | 3 PLACES ±.005 | ANGLES ±5°

DRAWN BY:	GMR	10-01-90
CHKD BY:	P C	10-08-90
APPD BY:	JCD	10-08-90
MAT:		
H.T.:		
FINISH:		

LEE TOOL SET
INSTALLATION AND EXTRACTION

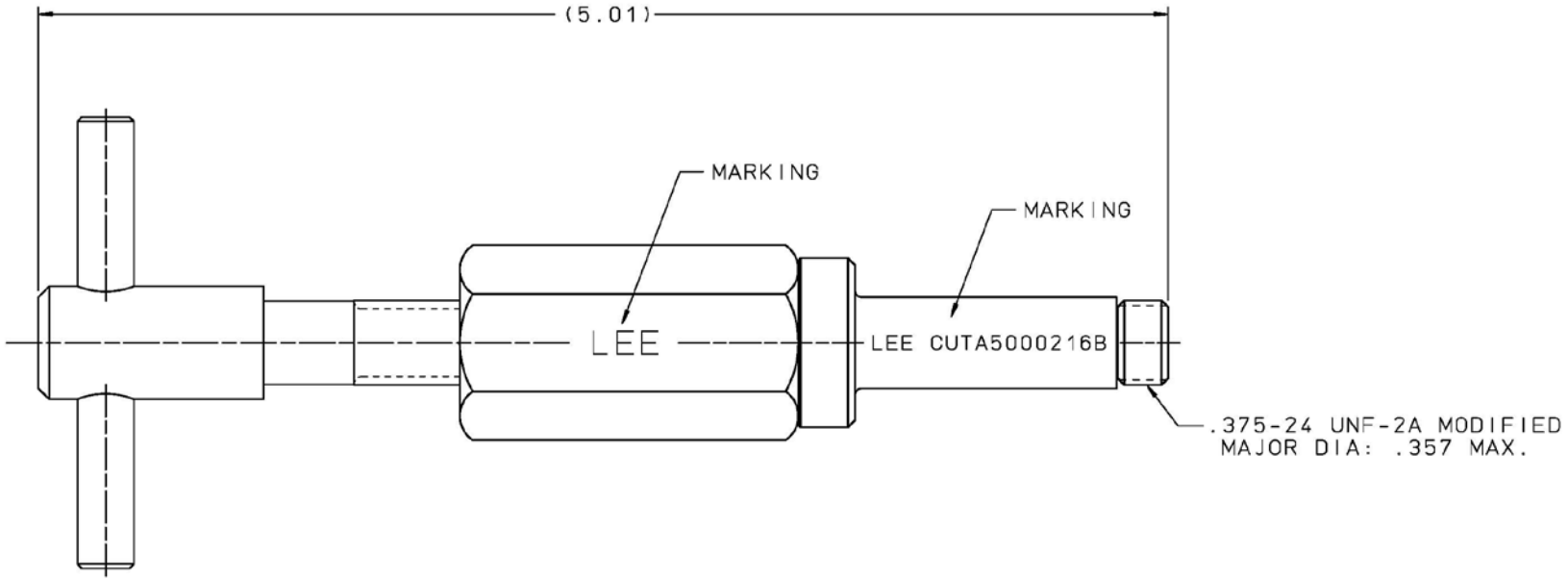
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA5000206C	A

DWG SCALE: NONE | SHEET 1 OF 1

CUTA5000216B

REV	DATE	BY	DESCRIPTION
A	07-02-87	SB	INITIAL RELEASE
2	03-03-99	HM	REDRAWN TO NEW FORMAT
3	08-13-10	KD	ADDED (5.01).



PROPRIETARY ITEM

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CUTD0472700

REFERENCE

DWG NO: CUTA5000216B

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY. ALL MANUFACTURING RIGHTS RESERVED.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	S B	07-02-87
CHKD BY:	J B	07-29-87
APPD BY:	SEA	08-03-87
MAT:		
H.T.:		
FINISH:		

LEE JACKING TOOL .500

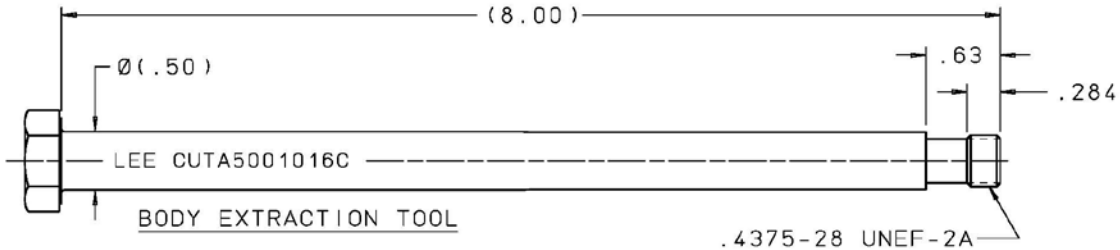
THE LEE COMPANY
WESTBROOK, CT 06498

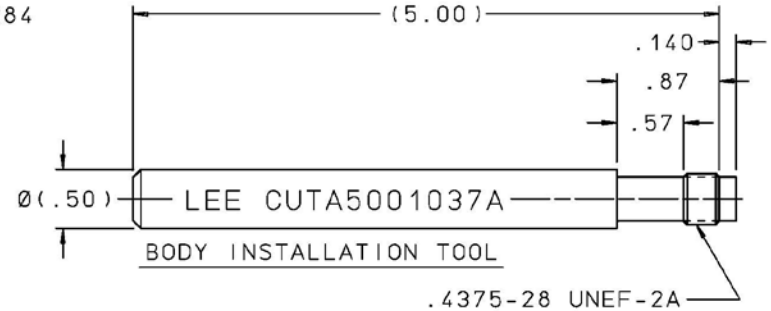
SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA5000216B	A

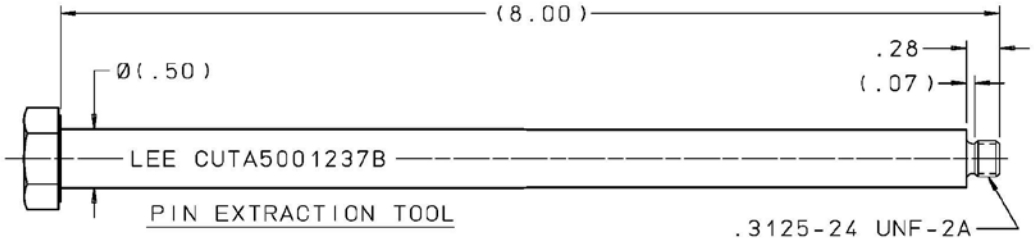
DWG SCALE: NONE SHEET 1 OF 1

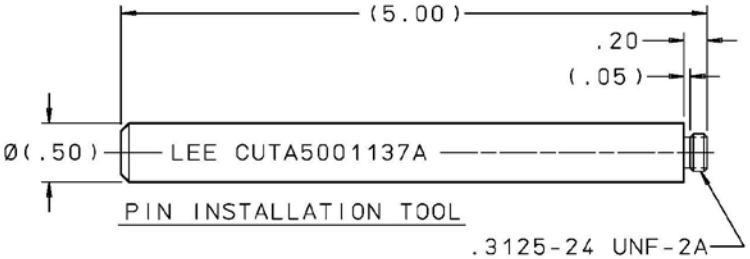
CUTA5000237C

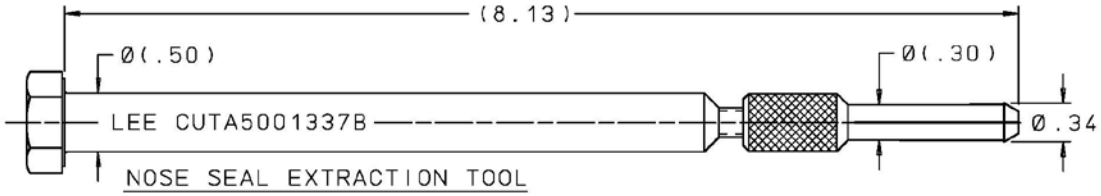
REV	DATE	BY	DESCRIPTION
A	07-14-89	KCT	INITIAL RELEASE
2	06-21-10	KD	REMOVED REV LETTER FROM MARKINGS. DELETED SHEET 2.

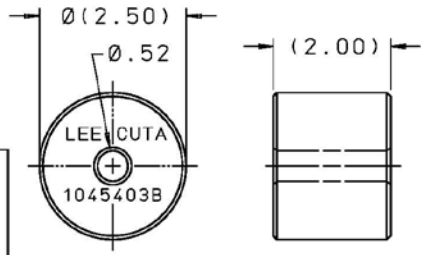












THIS TOOL SET IS FOR
INSTALLATION & EXTRACTION
OF
LEE .500 SHUTTLE VALVE HIGH STRENGTH

PROPRIETARY ITEM

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CUTD0105400
REFERENCE

DWG NO. CUTA5000237C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:
SURFACE FINISH ✓ ALL OVER
DIMENSIONS ARE IN INCHES
TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	KCT	07-14-89
CHKD BY:	P C	07-26-89
APPD BY:	JCD	07-28-89
MAT:		
H.T.:		
FINISH:		

LEE TOOL SET .500

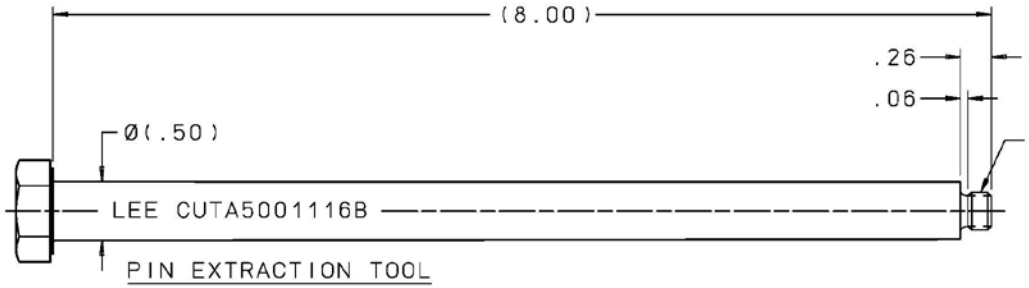
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA5000237C	A

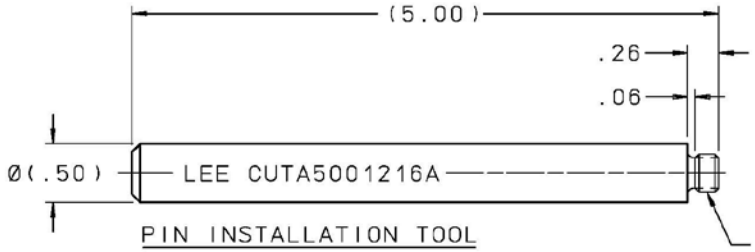
DWG SCALE: NONE | SHEET 1 OF 1

CUTA5000306C

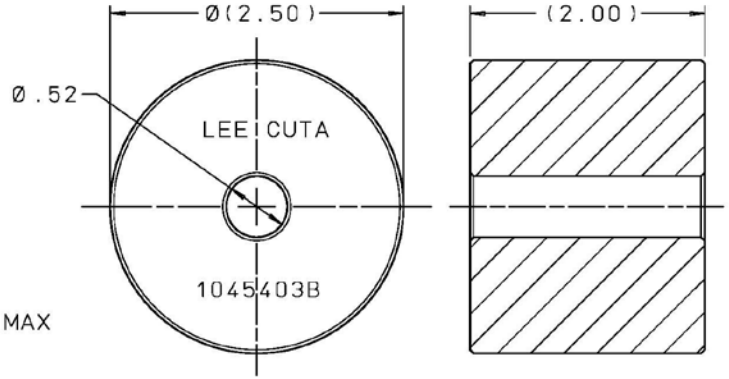
REV	DATE	BY	DESCRIPTION
A	01-28-98	BR	INITIAL RELEASE
B	06-03-02	HM	ADDED CUTA5000606.
2	06-22-10	KD	PIN EXT TOOL; Ø(.50) WAS Ø(.49), PIN INST TOOL; Ø(.50) WAS Ø(.49) & (5.00) WAS 5.00, BODY INST & EXTR TOOL; Ø(.50) WAS Ø(.49), STRIKER, Ø(2.50) WAS Ø2.50 & (2.00) WAS 2.00



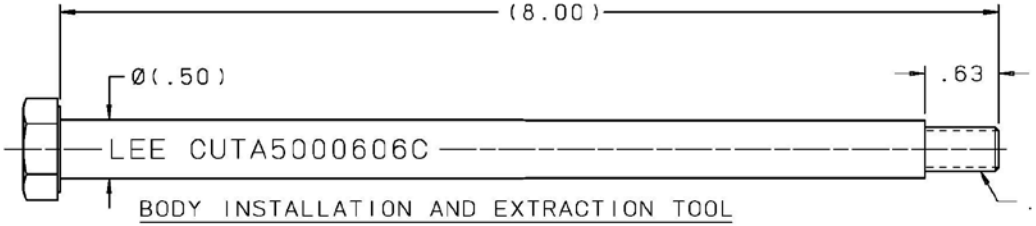
PIN EXTRACTION TOOL



PIN INSTALLATION TOOL



STRIKER



BODY INSTALLATION AND EXTRACTION TOOL

INSTALLATION & EXTRACTION TOOL SET FOR:

.500 HI Q CHECK

PROPRIETARY ITEM

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CUTD0406730

REFERENCE

DWG NO: CUTA5000306C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY. ALL MANUFACTURING RIGHTS RESERVED.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	B R	01-28-98
CHKD BY:	L B	02-02-98
APPD BY:	B B	02-03-98
MAT:		
H.T.:		
FINISH:		

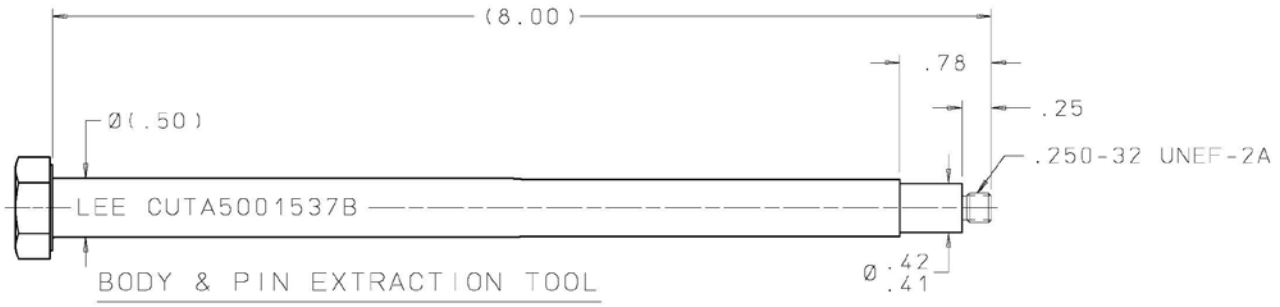
LEE TOOL SET
INSTALLATION & EXTRACTION

THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA5000306C	B

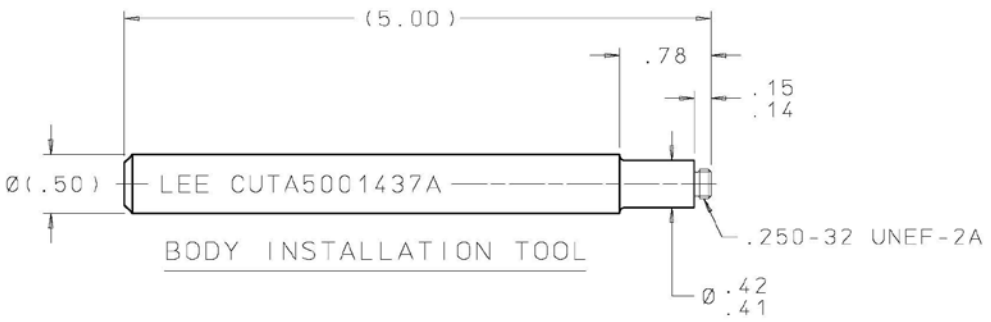
DWG SCALE: NONE SHEET 1 OF 1

CUTA5000337C

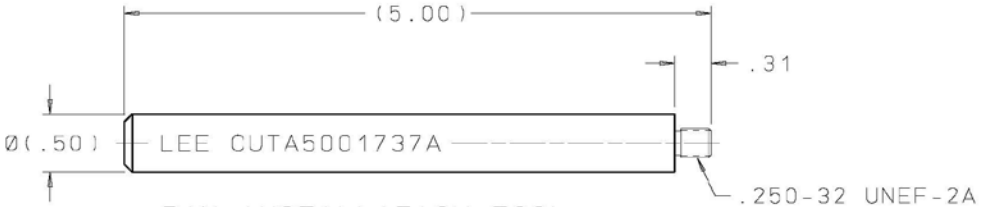


BODY & PIN EXTRACTION TOOL

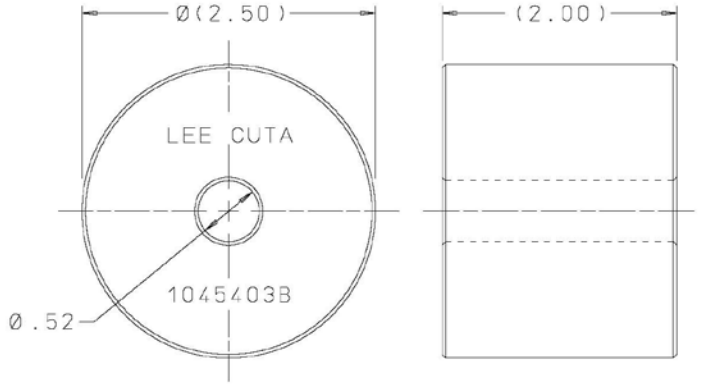
REV	DATE	BY	DESCRIPTION
B2	06-09-04	KD	REMOVED REV LETTER FROM MARKINGS.
3	08-06-10	KD	BODY/PIN EXTR TOOL: UPDATED HEX. ADDED .25. DELETED .21. Ø(.50) WAS Ø(.49). (8.00) WAS 8.075-7.925, Ø.42-.41 WAS Ø.423-.407. BODY INST TOOL:ADDED .78 & .15-.14. (5.00) WAS 5.075-4.925, Ø(.50) WAS Ø.501-.494 & Ø(.42-.41 WAS Ø.423-.407. PIN INST TOOL: (5.00) WAS 5.075-4.925, .31 WAS .325-.295 & Ø(.50) WAS Ø.501-.494. STRIKER: Ø(2.50) WAS Ø2.50 & (2.00) WAS 2.00.



BODY INSTALLATION TOOL



PIN INSTALLATION TOOL



STRIKER

INSTALLATION & EXTRACTION TOOL SET FOR:

.500-.510 LEE SVDA

PROPRIETARY ITEM

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CUTD0105430

REFERENCE

DWG NO: CUTA5000337C

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY. ALL MANUFACTURING RIGHTS RESERVED.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	GMR	09-13-91
CHK'D BY:	P C	09-19-91
APP'D BY:	JCD	09-19-91
MAT:		
H.T.:		
FINISH:		

LEE TOOL SET
INSTALLATION AND EXTRACTION

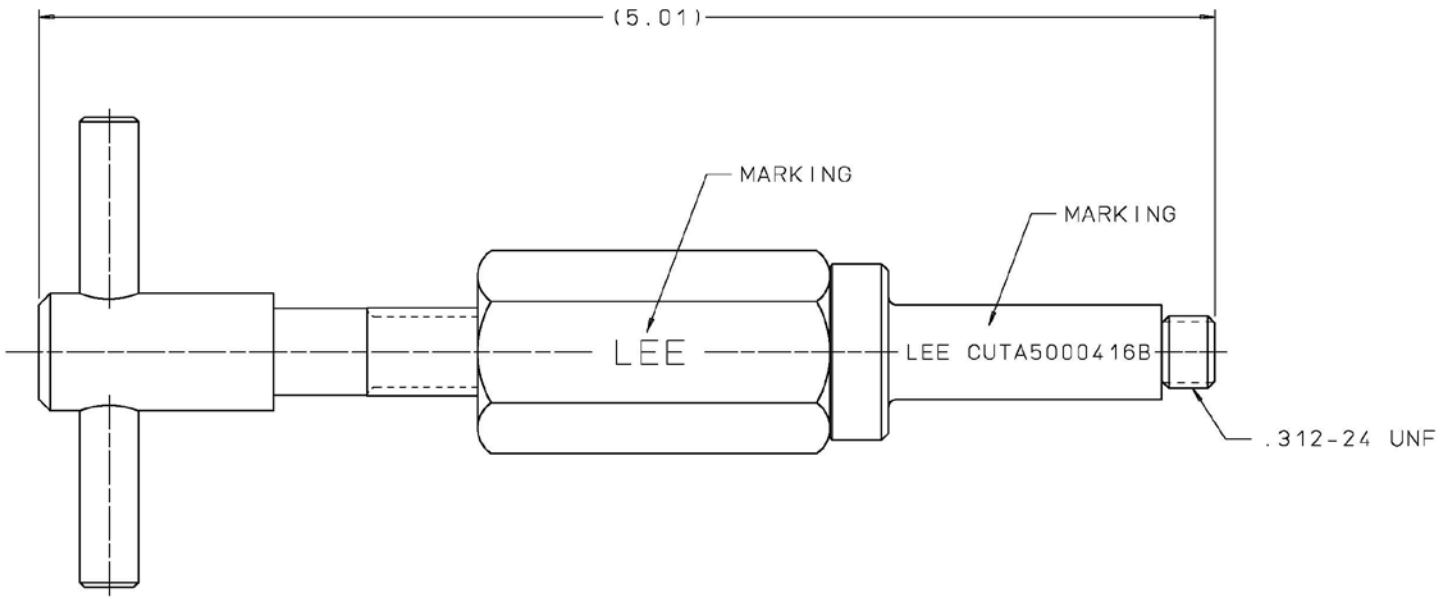
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA5000337C	B

DWG SCALE: NONE SHEET 1 OF 1

CUTA5000416B

REV	DATE	BY	DESCRIPTION
A	10-07-03	HM	INITIAL RELEASE
2	08-18-10	KD	ADDED (5.01).



CUTD0407370

REFERENCE

DWG NO: CUTA5000416B

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	H M	10-07-03
CHK'D BY:	L B	10-08-03
APP'D BY:	B B	10-13-03
MAT:		
H.T.:		
FINISH:		

LEE JACKING TOOL, .500

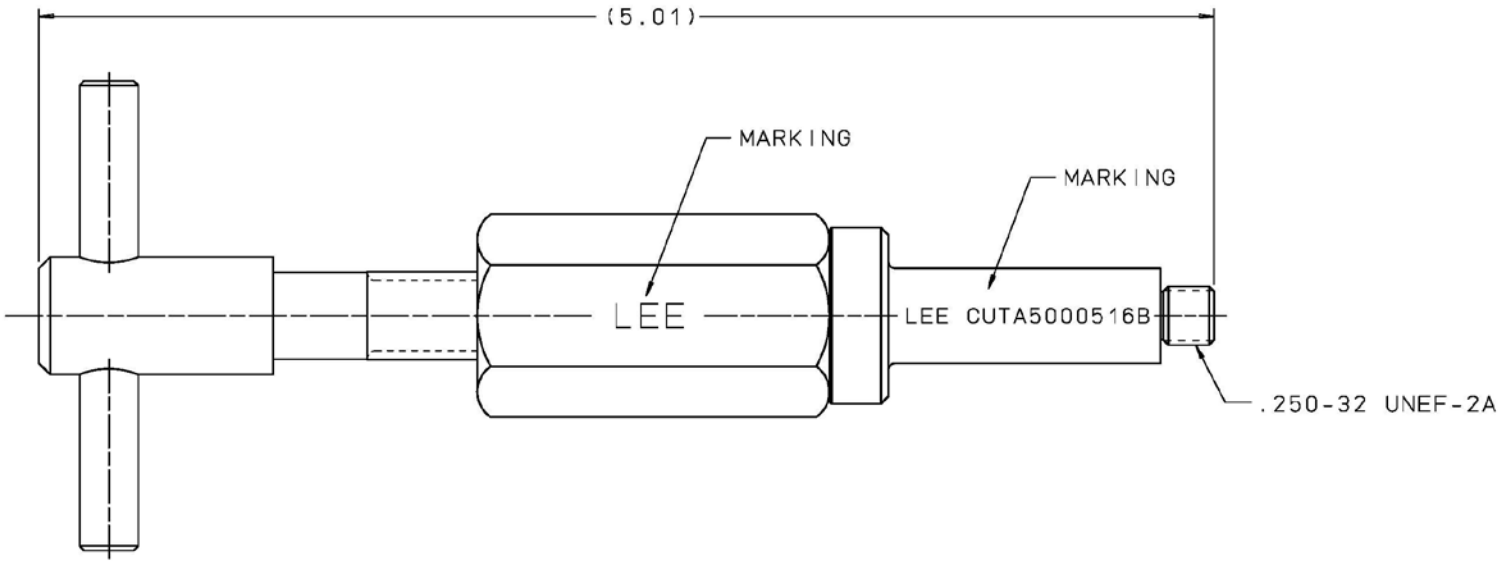
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA5000416B	A

DWG SCALE: NONE SHEET 1 OF 1

CUTA5000516B

REV	DATE	BY	DESCRIPTION
A	09-06-05	HM	INITIAL RELEASE
2	08-16-10	KD	ADDED (5.01).



CUTD0407550

REFERENCE

DWG NO: CUTA5000516B

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY. ALL MANUFACTURING RIGHTS RESERVED.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH √ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 3 PLACES ±.005 ANGLES ±5°

DRAWN BY:	H M	09-06-05
CHKD BY:	DEP	09-09-05
APPD BY:	B B	09-22-05
MAT:		
H.T.:		
FINISH:		

LEE JACKING TOOL, .500

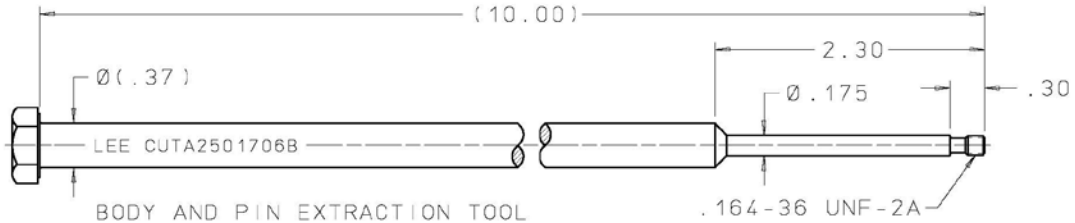
THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTA5000516B	A

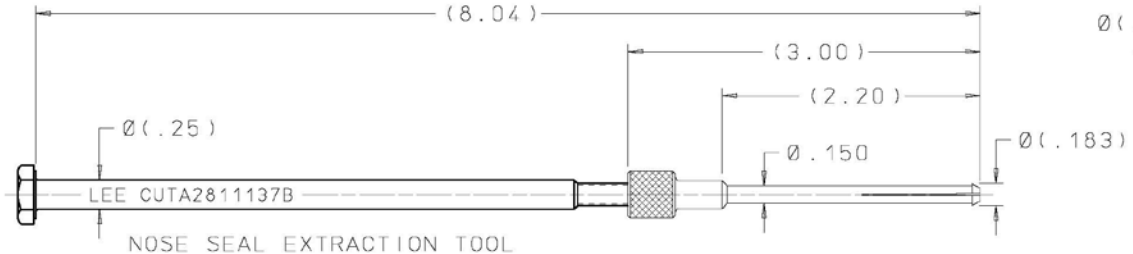
DWG SCALE: NONE SHEET 1 OF 1

CUTX0503050B

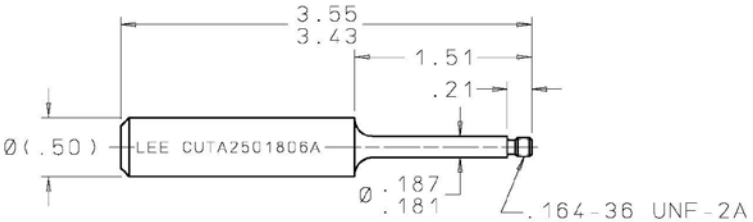
REV	DATE	BY	DESCRIPTION
A	07-16-91	GMR	INITIAL RELEASE
2	03-06-03	HM	UPDATED TO NEW FORMAT. REMOVED REV LTR FROM MARKINGS.
3	08-03-10	KD	BODY/PIN EXTR TOOL, UPDATED HEX & ADDED Ø(.37). NOSE SEAL, UPDATED HEX. STRIKER, Ø(2.00) WAS Ø2.00. BODY INST TOOL, ADDED .21, Ø(.50) WAS Ø.50. PIN INST TOOL, ADDED .12, Ø(.50) WAS Ø.50



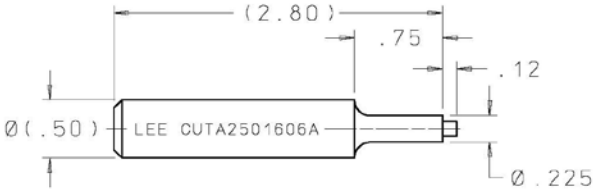
BODY AND PIN EXTRACTION TOOL



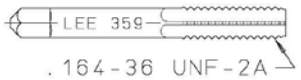
NOSE SEAL EXTRACTION TOOL



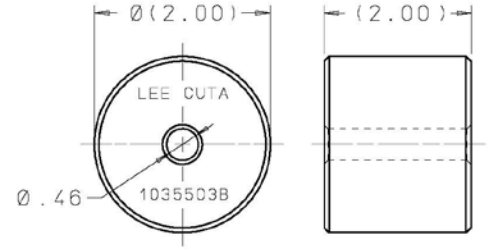
BODY INSTALLATION TOOL



PIN INSTALLATION TOOL



BOTTOMING TAP (PIN EXTRACTION)
CUTA35955033B



STRIKER

TOOL SET FOR INSTALLATION AND EXTRACTION OF:

LEE .250 HIGH PRESSURE PILOT OPERATED CHEK SPECIAL (CPRX0500100B)

PROPRIETARY ITEM

This document contains proprietary information and is submitted upon the express condition that the information contained herein will not be used directly or indirectly in any way detrimental to the interests of The Lee Company, and/or in violation of regulation DAR 7-104.9(a)(1 July 1974), et seq.

CUTD0503050
REFERENCE

DWG NO. CUTX0503050B

NOTES AND DIMENSIONS SHOWN HERE ON ARE FOR INSPECTION IDENTIFICATION ONLY.

EXTERNAL CORNER RAD:
INTERNAL FILLET RAD:

SURFACE FINISH ✓ ALL OVER
DIMENSIONS ARE IN INCHES

TOLERANCES
2 PLACES ±.015 | 3 PLACES ±.005 | ANGLES ±5°

DRAWN BY:	GMR	07-16-91
CHK'D BY:	P C	07-19-91
APPD BY:	JCD	08-01-91
MAT:		
H.T.:		
FINISH:		

LEE TOOL SET
INSTALLATION/EXTRACTION, SPECIAL

THE LEE COMPANY
WESTBROOK, CT 06498

SIZE	CAGE CODE	DWG NO.	REV
B	92555	CUTX0503050B	A

DWG SCALE: NONE | SHEET 1 OF 1

THE LEE COMPANY

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