Specifications	Bidder Complies	
	Yes	No

GENERAL CONDITIONS
(BID PRICE)

23.00 Hydraulic Tool Bid Price

Bidder offers the following prices for the hydraulic rescue tools specified in the above bid statement.

-Hydraulic power unit with gasoline engine $ 7120 each DPU30
-Optional power with gasoline engine $ 7988 each DPU 71
-Manual power unit #1 $ 5018 each PPU 15
-Manual power unit #2 $ 3716 each HTT 1800C
-Air/Hydraulic power unit $ 1999 each AHS 1400
-Hydraulic cutter #1 $ 4183 each 4020
-Hydraulic cutter #2 $ 5054 each 4050 NCT
-Hydraulic cutter #3 $ 5424 each 4055 NCT
-Hydraulic mini cutter $ 2619 each 3005
-Hydraulic special materials cutter $ 3602 each SMC 4006
-Hydraulic spreader #1 $ 5509 each 4242
-Spreader #1 Accessory package $ 744 each
-Hydraulic spreader #2 $ 6535 each 4260
-Spreader #2 Accessory package $ 1160 each
-Hydraulic spreader #3 $ 6024 each 4240
-Spreader #3 Accessory package $ 801 each
-Hydraulic Extension Hose $ 794 each 32' CORE
-Small Hydraulic Push/Pull Ram $ 2832 each 4321
-Large Hydraulic Push/Pull Ram $ 3067 each 4371
-Medium Sized Twin Plunger Ram $ 3351 each 4322
-Push/Pull Ram Accessory package $ Clarification each
-Small Hydraulic Telescopic Ram $ 3415 each 4340
-Large Hydraulic Telescopic Ram $ 4201 each 4350
-Telescopic Ram Accessory package $ N/A each
-Hydraulic Cutter/Spreader Combination tool $ 4296 each 4150
-Manual Cutter/Spreader Combination tool $ 4409 each HCT 3120
-Electric Cutter/Spreader Combination tool $ 10,710 each ECT 3120
-Hydraulic Lifting Wedge $ 2993 each 3624
-Replacement Blades for Hydraulic cutter #1 $ 407 each for 4020
-Replacement Blades for Hydraulic cutter #2 $ 727 each for 4050
-Replacement Blades for Hydraulic cutter #3 $ 922 each for 4055
-Replacement Blades for Hydraulic Mini Cutter $ 388 each for 3005
-Replacement Blades for Special Materials Cutter $ 153 each for SMC 4006
-Percentage of Catalogue Items (Parts Price list) X 5% each → see clarification

23.01 Bid Price Guarantee

Bidder guarantees price for a period of two (2) years for future purchases. All pricing shall include delivery and set up.

Specifications	Bidder Complies	
	Yes	No

GENERAL CONDITIONS

(Service of Hydraulic Tools)

24.00 Guarantee of Tool Repair

Award winning vendor guarantees service representative to assess tool repair or replacement needs at purchaser's location within twenty-four (24) hours of being contacted by purchaser. Vendor will provide replacement tool while on sight for service call and/or while tool is returned to service facility.

24.01 Service Training

Manufacturer of purchased tools shall provide training for tool service and repair to the purchasing agency.

EXCEPTIONS

All exceptions shall be stated no matter how seemingly minor. Any exceptions not taken shall be assumed by the purchaser to be included in the proposal, regardless of the cost to the bidder.

COMMERCIAL GENERAL LIABILITY INSURANCE

The successful bidder shall, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of commercial general liability insurance:

Products/Completed Operations Aggregate	$2,000,000
Personal and Advertising Injury	$1,000,000
Each Occurrence	$1,000,000

Coverage shall be written on a Commercial General Liability form. The policy shall be written on an occurrence form and shall include Contractual Liability coverage. The policy shall include owner as an additional insured as their interest may appear.

The required limits can be provided by one or more policies provided all other insurance requirements are met.

A carrier(s) rated "Excellent" by A.M. Bests shall provide coverage.

UMBRELLA/EXCESS LIABILITY INSURANCE

The successful bidder shall, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of umbrella liability insurance:

Specifications	Bidder Complies	
	Yes	No
Aggregate: $25,000,000 Each Occurrence: $25,000,000 The policy shall be written on an occurrence basis and at a minimum provide the same coverage's as Bidder's General Liability, Automobile Liability and Employer's Liability policies. Owner shall be included as an additional insured on the General Liability and Automobile Liability policies as their interest may appear. The required limits can be provided by one or more policies provided all other insurance requirements are met. Bidder agrees to furnish owner with a current Certificate of Insurance with the coverage listed above along with its bid. The certificate shall be made out to the purchaser and be an original; no photocopies shall be accepted. The Certificate of Insurance shall provide that owner be given 30 days advance notice of cancellation, no renewal or material change in coverage.		

RISK MANAGEMENT PROVISIONS
INSURANCE AND INDEMNIFICATION

INDEMNIFICATION AND HOLD HARMLESS PROVISION

(1) It is understood and agreed by the parties that Vendor hereby assumes the entire responsibility and liability for any and all damages to persons or property caused by or resulting from or arising out of any act or omission on the part of Vendor or its employees, agents,. servants, owners, principals, licensees, assigns or subcontractors of any tier (hereinafter "Vendor") under or in connection with this agreement and/or the provision of goods or services and the performance or failure to perform any work required thereby.

(2) Vendor shall indemnify, save, hold harmless and defend the Lexington-Fayette Urban County Government and its elected and appointed officials, employees, agents, volunteers, and successors in interest (hereinafter "LFUCG") from and against all liability, damages, and losses, including but not limited to, demands, claims, obligations, causes of action, judgments, penalties, fines, liens, costs, expenses, interest, defense costs and reasonable attorney's fees that are in any way incidental to or connected with, or that arise or are alleged to have arisen, directly or indirectly, from or by Vendor's performance or breach of the agreement and/or the provision of goods or services provided that: (a) it is attributable to personal injury, bodily injury, sickness, or death, or to injury to or destruction of property (including the loss of use resulting therefrom), or to or from the negligent acts, errors or omissions or willful misconduct of the Vendor; and (b) not caused solely by the active negligence or willful misconduct of LFUCG.

(3) In the event LFUCG is alleged to be liable based upon the above, Vendor shall defend such allegations and shall bear all costs, fees and expenses of such defense, including but not limited to, all reasonable attorneys' fees and expenses, court costs, and expert witness fees and expenses, using attorneys approved in writing by LFUCG, which approval shall not be unreasonably withheld.

(4) These provisions shall in no way be limited by any financial responsibility or insurance requirements, and shall survive the termination of this agreement.

FINANCIAL RESPONSIBILITY

VENDOR understands and agrees that it shall, prior to final acceptance of its bid and the commencement of any work, demonstrate the ability to assure compliance with the above Indemnity provisions and these other risk management provisions.

INSURANCE REQUIREMENTS

YOUR ATTENTION IS DIRECTED TO THE INSURANCE REQUIREMENTS BELOW, AAND YOU MAY NEED TO CONFER WITH YOUR INSURANCE AGENTS, BROKERS, OR CARRIERS TO DETERMINE IN ADVANCE OF SUBMISSION OF A RESPONSE THE AVAILABILITY OF THE INSURANCE COVERAGES AND ENDORSEMENTS REQUIRED HEREIN. IF YOU FAIL TO COMPLY WITH THE INSURANCE REQUIREMENTS BELOW, YOU MAY BE DISQUALIFIED FROM AWARD OF THE CONTRACT.

Required Insurance Coverage

VENDOR shall procure and maintain for the duration of this contract the following or equivalent insurance policies at no less than the limits shown below and cause its subcontractors to maintain similar insurance with limits acceptable to LFUCG in order to protect OWNER against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by LFUCG. The cost of such insurance shall be included in any bid:

Coverage	Limits
General Liability (Insurance Services Office Form CG 00 01)	$1 million per occurrence, $2 million aggregate or $2 million combined single limit
Commercial Automobile Liability (Insurance Services Office Form CA 0001)	combined single, $1 million per occurrence
Worker's Compensation	Statutory
Employer's Liability	$500,000.00

The policies above shall contain the following conditions:

a. All Certificates of Insurance forms used by the insurance carrier shall be properly filed and approved by the Department of Insurance for the Commonwealth of Kentucky. LFUCG shall be named as an additional insured in the General Liability Policy and Commercial Automobile Liability Policy using the Kentucky DOI approved forms.

b. The General Liability Policy shall be primary to any insurance or self-insurance retained by LFUCG.

c. The General Liability Policy shall include a Products Liability endorsement unless it is deemed not to apply by OWNER.

d. LFUCG shall be provided at least 30 days advance written notice via certified mail, return receipt requested, in the event any of the required policies are canceled or non-renewed.

e. Said coverage shall be written by insurers acceptable to LFUCG and shall be in a form acceptable to LFUCG. Insurance placed with insurers with a rating classification of no less than Excellent (A or A-) and a financial size category of no less than VIII, as defined by the most current Best's Key Rating Guide shall be deemed automatically acceptable.

Renewals

After insurance has been approved by OWNER, evidence of renewal of an expiring policy must be submitted to OWNER, and may be submitted on a manually signed renewal endorsement form. If the policy or carrier has changed, however, new evidence of coverage must be submitted in accordance with these Insurance Requirements.

Deductibles and Self-Insured Programs

IF YOU INTEND TO SUBMIT A SELF-INSURANCE PLAN IT MUST BE FORWARDED TO LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DIVISION OF RISK MANAGEMENT, 200 EAST MAIN STREET, LEXINGTON, KENTUCKY 40507 NO LATER THAN A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO THE RESPONSE DATE. Self-insurance programs, deductibles, and self-insured retentions in insurance policies are subject to separate approval by Lexington-Fayette Urban County Government's Division of Risk Management, upon

review of evidence of VENDOR's financial capacity to respond to claims. Any such programs or retentions must provide LFUCG with at least the same protection from liability and defense of suits as would be afforded by first-dollar insurance coverage. If VENDOR satisfies any portion of the insurance requirements through deductibles, self-insurance programs, or self-insured retentions, VENDOR agrees to provide Lexington-Fayette Urban County Government, Division of Risk Management, the following data prior to the final acceptance of bid and the commencement of any work:

a. Latest audited financial statement, including auditor's notes.

b. Any records of any self-insured trust fund plan or policy and related accounting statements.

c. Actuarial funding reports or retained losses.

d. Risk Management Manual or a description of the self-insurance and risk management program.

e. A claim loss run summary for the previous five (5) years.

f. Self-Insured Associations will be considered.

Verification of Coverage

VENDOR agrees to furnish LFUCG with all applicable Certificates of Insurance signed by a person authorized by the insurer to bind coverage on its behalf prior to final award, and if requested, shall provide LFUCG copies of all insurance policies, including all endorsements.

Right to Review, Audit and Inspect

VENDOR understands and agrees that LFUCG may review, audit and inspect any and all of its records and operations to insure compliance with these Insurance Requirements.

DEFAULT

VENDOR understands and agrees that the failure to comply with any of these insurance, safety, or loss control provisions shall constitute default and that LFUCG may elect at its option any single remedy or penalty or any combination of remedies and penalties, as available, including but not limited to purchasing insurance and charging VENDOR for any such insurance premiums purchased, or suspending or terminating the work.

00337079

Vogelpohl Fire Equipment, Inc

2770 Circleport Dr. Erlanger, Ky 41018
Office: 859-282-1000 Fax: 859-282-1550 800-797-8317

Clarifications & Additional Pricing

1) The Holmatro PPU15 power unit no longer allows for two tools to be hooked up with the CORE technology. This power unit is now a single connection pump.
2) Your specifications for the telescopic rams ask for ram supports. These are not part of the tool and are not included in the pricing of the ram. The Holmatro #HRS22 ram supports are $298.00 each.
3) There are several different types of brackets available for the Holmatro equipment. They have a wide range of prices depending on customization. We have proposed brackets made by Plastix Plus which are a good starting point.
4) The accessory package that we bid for both spreaders include pulling tips and chains. If you also wish to purchase cutting tips they are (each) $151 for the 4242 spreader, $208.00 for the 4260 spreader and $184.00 for the 4240 spreader. Spare spreading tips (each) are $166.00 for the 4242 spreader, $230.00 for the 4260 spreader and $248.00 for the 4240 spreader.
5) Holmatro does not have an accessory package for their rams. The following are the prices for various accessories we have for our standard rams:

a. 6.5" Extension	$290.00
b. 13" Extension	$331.00
c. 23.5" Extension	$366.00
d. Wedge Head	$169.00
e. Conical Point	$146.00
f. Base Plate	$201.00
g. Pulling Tips	$531.00
h. Pulling Chains	$246.00

6) There are no accessories available for the telescopic rams

7) We have supplied a price for a single 32' hose. We did not include any 32' hoses in the price of any of the power units. You must add however many hoses you need to complete the system you desire.

8) We will offer $1500.00 trade-in allowance for a complete system containing a gasoline hydraulic power unit, hydraulic spreader and cutter, along with a small, medium and large ram and two hydraulic hoses.

9) The BCT3120 combination tool deluxe package in the bid contains:

   a. BCT3120
   b. 2 batteries
   c. Carrying strap
   d. DC power cord
   e. Pelican case
   f. AC or DC charger

   The BCT3120 combination tool standard package includes the above items less the DC power cord and Pelican Case for $9509.00

10) See Enclosed Certificate of Liability Insurance for the amount of $2,000,000.00. Your bid calls for 25,000,000.00.

11) Parts pricing will be provided with a 5% discount off of the list pricing on all genuine Holmatro parts.

Voluntary Equipment Pricing:

1) Holmatro SPU16 CORE Personal Power Unit $6193.00
2) Holmatro CC 20 C Concrete Crusher CORE $11741.00
3) Holmatro 4007 CORE Mini Cutter $3274.00
4) Holmatro 4360 Extendo Ram CORE $4201.00
5) Holmatro HPW4624 Hand Operated Power Wedge $4978.00

OP ID: PLR

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 08/02/11

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Hukill Hazlett Harrington Agy 4601 Malsbary Road Cincinnati, OH 45242 Peggy L. Roberts 513-793-1190 513-793-5730	CONTACT NAME: PHONE (A/C, No, Ext): FAX (A/C, No): E-MAIL ADDRESS: PRODUCER CUSTOMER ID #: VOGEL-3
INSURED Vogelpohl Fire Equipment, Inc. 2770 Circleport Drive Erlanger, KY 41018	INSURER(S) AFFORDING COVERAGE — NAIC # INSURER A : Travelers Commercial Lines — 25674 INSURER B : National Union Fire Ins Co. INSURER C : INSURER D : INSURER E : INSURER F :

COVERAGES — CERTIFICATE NUMBER: — REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	GENERAL LIABILITY X COMMERCIAL GENERAL LIABILITY CLAIMS-MADE X OCCUR X PD DEDUCTIBLE GEN'L AGGREGATE LIMIT APPLIES PER: POLICY PRO-JECT LOC			Y-630-7915N235 PER OCCURRENCE: $1000	08/04/11	08/04/12	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ 1,000,000 $ 500,000 $ 5,000 $ 1,000,000 $ 2,000,000 $ 2,000,000
A	AUTOMOBILE LIABILITY X ANY AUTO ALL OWNED AUTOS SCHEDULED AUTOS X HIRED AUTOS X NON-OWNED AUTOS			Y-810-7915N235-TIL-09 Y-810-7915N235-TIL-09 PHYS DMG: $40,000	08/04/11	08/04/12	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$ 1,000,000 $ $ $
A	X GARAGEKEEPERS			Y-810-7915N235-TIL-09	08/04/11	08/04/12	GKLL	$ 3,000,000
B	UMBRELLA LIAB X OCCUR EXCESS LIAB CLAIMS-MADE DEDUCTIBLE X RETENTION $			EBU063747566	08/04/11	08/04/12	EACH OCCURRENCE AGGREGATE	$ 2,000,000 $ 2,000,000
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y / N (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	N / A		YJUB-5059R03-9-10	08/04/11	08/04/12	X WC STATU-TORY LIMITS OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	$ 500,000 $ 500,000 $ 500,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

CERTIFICATE HOLDER

PROOF--

Proof of Insurance
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXX, XX XXXXXXXXXX

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE
Peggy L. Roberts

DPU30 DUO PUMP

General

This pump must be compliant with NFPA 1936 Standard on Powered Rescue Tool Systems, 1999 edition. The pump must allow operation in a humid and dusty environment. The pump must be capable of powering two tools at full power, independently and simultaneously. For this purpose the pump must have two separate valve blocks, each incorporating a manually operated pressure relief valve. Each valve must have two positions, "Operation" and "Neutral". Even when under full pressure the relief valve should be easy to operate and relieve the pressure under full load by just flipping a lever. The relief valve must vent internally. Couplers must be one hand operated, flat-face, non-drip couplings with built-in automatic locking feature. Couplers must be supplied with aluminum protective dust caps. The pump will be provided with a Pressure Relief Device to allow the relief of pressure in hose lines due to temperature change or inadvertent pressurization of the line when no tool is connected.

Engine

The pump shall be driven by a Honda 4-cycle gasoline engine of at least 3.0 HP (2237 watts). The engine shall have a gasoline tank of at least 1.5 qts (1.4 liter), which allows the engine to run for at least one hour during intermittent operation. For ease of operation the fuel tank shall incorporate a highly visible fuel level indicator.

Pump

Each pump part shall be a two stage radial piston pump with an output of not less than 131 cu in/min (2150 cc/min) in the first stage and not less than 27.5 cu in/min (450 cc/min) in the second stage. The pump shall have two automatic sequence valves, set at approximately 2,900 psi (200 bar), that switch the first stage to second stage, in order to allow full pressure to be built up to a maximum working pressure of 10,500 psi (720 bar). Each pump shall be protected with two internal safety valves. In addition, each valve block shall have an external safety valve, factory set at 10,500 psi (720 bar).

Carrying frame

The pump shall have a carrying frame that protects all parts of the pump, and makes it easy to carry the pump unit. In order to provide improved grip in all weather conditions, the frame must have a non-slip surface. The frame shall be provided with anti-vibration dampers to keep the pump at its position while running. The pump unit shall be mounted to the frame with rubber isolation dampers to reduce vibration and shock to the pump unit.

Tank and fluid

The pump shall be designed for the use of non-toxic mineral oil. The effective oil contents shall be no less than 3.2 qt. (3 liters). For ease of operation the oil tank shall incorporate a highly visible oil level indicator. The oil contents of the tank when filled to the proper level shall be no less then 3.8 qt. (3.6 liters).

Weight and Dimensions

The complete unit, including pump, frame, hydraulic oil and gasoline shall weigh no more than 58 lbs (26.3 kg). The dimensions of the complete pump unit shall be within (LxWxH): 19 5/8 in x 13 3/8 in x 15 3/8 in (500 mm x 340 mm x 390 mm).

Sound level

The sound level of the Duo Pump must not exceed 83 dB measured at a distance of 13 ft (4 meters).

DPU31 Gasoline Powered Pump with CORE Technology™

General

The pump must allow operation in a humid and dusty environment. The pump must be capable of powering two tools at full power, independently and simultaneously. For this purpose the pump must have two separate valve outlets incorporated in a single valve block, each incorporating a Holmatro CORE Technology™ flat face coupler which will allow the user to connect and disconnect the rescue tool while the pump is operating and flowing oil without having to operate a manual pressure release valve. Couplers must be one hand operated, flat-face, non-drip couplings with built-in automatic locking feature. Couplers must be supplied with aluminum protective dust caps. The valve block shall be provided with LED illumination for easy identification and coupling in low light conditions. The pump will be provided with a Pressure Relief Device to allow the relief of pressure in hose lines due to temperature change.

Engine

The pump shall be driven by a Honda 4-cycle gasoline engine of at least 3.0 HP (2237 watts). The engine shall have a gasoline tank of at least 1.3 qts (1.2 liter), which allows the engine to run for at least one hour during intermittent operation. The fuel tank shall be translucent and shall also be provided with a highly visible fuel level indicator.

Pump

Each pump part shall be a two stage axial piston pump with an output of not less than 171 cu in/min (2800 cc/min) in the first stage and not less than 34 cu in/min (550 cc/min) in the second stage. The pump shall have two automatic sequence valves, set at approximately 2,900 psi (200 bar), that switch the first stage to second stage, in order to allow full pressure to be built up to a maximum working pressure of 10,500 psi (720 bar). Each pump part shall be protected with an internal pressure relief valve to protect against over-pressurization of the pump parts. In addition, each pump unit shall have an external pressure relief valve, to regulate pressure to the tool(s), factory set at 10,500 psi (720 bar).

Carrying frame

The pump shall have a carrying frame that protects all parts of the pump, and makes it easy to carry the pump unit. The frame shall be provided with anti-vibration dampers to keep the pump at its position while running. The pump unit shall be mounted to the frame with rubber isolation dampers to reduce vibration and shock to the pump unit.

Tank and fluid

The pump shall be designed for the use of non-toxic mineral oil. The effective oil contents shall be no less than 2.6 qt. (2.5 liters). For ease of operation the oil tank shall incorporate a highly visible oil level indicator.

Weight and Dimensions

The complete unit, including pump, frame, hydraulic oil and gasoline shall weigh no more than 55 lbs (25 kg). The dimensions of the complete pump unit shall be within (LxWxH): 23 ½" x 11 ½" x 16 ¾" (600 x 290 x 425mm).

Sound level

The sound level of the Duo Pump must not exceed 83 dB measured at a distance of 13 ft (4 meters).

PPU-15 GASOLINE PUMP

General

This pump must be compliant with NFPA 1936 Standard on Powered Rescue Tool Systems, 1999 edition. The pump must allow operation in a humid and dusty environment and thus is provided with an easy to clean air filter on the engine. The pump must have the capability for two-tool connection with selective operation of one tool at a time. The selector valve will be designed so as to permit selection between either of the two line positions or the neutral position. The pump must have pressure dump valve that allows inadvertent pressurization to be relieved from full load by just flipping a lever. Couplers must be one hand operated, flat-face, non-drip couplings with built-in automatic locking feature. Couplers must be supplied with aluminum protective dust caps. The pump will be provided with a Pressure Relief Device to allow the relief of pressure in hose lines due to temperature change.

Engine

The unit shall be driven by a compact Honda 4 stroke gasoline engine of at least 2.5 HP set at 4,500 rpm. The engine shall have a gasoline tank of at least 1.3 qt. (1.25 L) that allows the pump to run for at least 2 hours.

Pump

The pump shall be a two-stage radial piston pump with pump output of not less than 139 cu in/min (2,280 cc/min) in the first stage and a pump output of not less than 37 cu in/min (620 cc/min) in the second stage. The pump shall have an automatic sequence valve, set at approx. 2683 psi (185 bar), that switches the first stage pump to no-load in order to allow full pressure to be built up to a maximum working pressure of approx. 10,500 psi (720 bar). The mini pump shall be protected with an internal safety valve. In addition to that, the pump must have an external safety valve, factory set at 10,500 psi (720 bar).

Carrying Handle

The pump shall have an integrated carrying handle, which makes it easy to carry the pump unit.

Tank and fluid

The oil tank shall contain not less than 2.4 qt (2.3 L) to allow a proper cooling of the hydraulic fluid and shall be provided with an automatic air vent in the fill cap. The pump shall be designed for the use of non-toxic mineral oil. The effective oil contents shall be no less than 2.1 qt (2.0 L).

Weight and Dimensions

The complete pump ready to use shall weigh no more than 35 lbs (15.9 kg). The dimensions of the complete pump unit shall be within (LxWxH): 17 ¾ in x 12 in x 15 in (451 mm x 305 mm x 381 mm).

The sound level

The sound level of the pump must not exceed 83 dB measured at a distance of 13 ft (4 meters).

AHS 1400 AIR/HYDRAULIC PUMP

General

The pump will have a maximum operating pressure of 10,500 psi (720 bar). The pump must have a one tool connection and a manual pressure relief valve situated over the pressure outlet in such way that inadvertent pressurization cannot take place but that allows a pressure relief under full load by just pressing the foot pedal. Couplers must be drip free with quick connect design.

Power Source

The unit shall be driven by an air supply operating at 125 psi (8.5 bar). Air consumption unloaded shall be no less than 184 cfm; loaded shall be no less than 153 cfm.

Pump

The pump will be a reciprocating air/hydraulic pump for use in high hazard areas. The pump shall have unloaded output of not less than 58 cu in/min (960 cc/min) and loaded output of 25 cu in/min (410 cc/min). The pump will consume air at a rate of 3 gal/min (700 L/min) unloaded and 2.5 gal/min (580 L/min) loaded. The air intake port will be 1/4" (6.35mm) BSP and the oil port will be 3/8" (9.5 mm) NPT. The pump shall be protected with an internal safety valve. In addition, the pump must have an external safety valve, factory set at 10,500 psi (720 bar).

Tank and fluid

The oil tank shall contain 1.8 qt. (1.7 L) to allow a proper cooling of the hydraulic fluid and shall be provided with an automatic air vent. The pump shall be designed for the use of non-toxic mineral oil. The effective oil contents shall be no less than 1.7 qt. (1.6 L).

Weight and Dimensions

The complete pump's ready to use weight will be 15 lbs. (6.5 kg). The dimensions of the complete pump unit shall be within (LxWxH): 13 1/2 in x 5 in x 8 ¼ in (343 mm x 127 mm x 210 mm).

The sound level

The sound level of the pump/compressor must not exceed 85 dB measured at a distance of 13 ft (4 meters).

4020 HEAVY DUTY 5" RESCUE CUTTER

General

The tool must be UL Listed: This tool must have successfully completed the rescue tool test program certified by Underwriters Laboratories, Inc. The tool must be capable of withstanding a static over-load pressure of twice the working pressure. This 2:1 over-load ratio is a UL requirement to provide maximum safety to the operator. This tool must ***also*** be compliant with NFPA 1936 Standard on Powered Rescue Tools, 2005 edition. The tool must be a "one-person" operated lightweight tool, which means that one person will be able to position, guide and operate the tool without the assistance of other people. For this reason the tool will be equipped with a carrying handle, which allows the operator to keep the tool evenly balanced in all positions, even with one hand. To eliminate connection errors and reduce deployment time the tool shall be supplied with one hydraulic coupler. This single coupler shall have a coaxial design with the pressure line inside of the return line to allow for rapid simultaneous connection of both lines with one connection motion. To avoid hindrance to the operator the coupler must be extremely compact and lightweight. The coupler design shall incorporate an automatic return valve to permit connection and disconnection of the tool to the hose *while under flow*. The coupler must be a flat-face, non-drip coupling with a built-in automatic locking feature and must be one hand operated. The coupler shall permit an unhindered 360° rotation at the connection point to avoid twisting or stressing the hose. The coupler must be supplied with a protective aluminum dust cap. The hose connection point will be to the rear of the dead man's handle, leading away in line with the center axis of the tool, avoiding interference with the operation of the tool.

Dead Man's Handle

The tool must be activated by means of a rotary dead man's handle, operated by a twist of the wrist. For ease of operation, the handle shall have a maximum rotation of 20° in either direction. When the dead man's handle is released, it must automatically return to the neutral position. The dead man's handle will provide one-handed control of opening and closing functions. The dead man's handle shall provide 360 degree access to the operator allowing operation of the tool in any position. The dead man's handle must be located in such a way that it can be operated, guided and supported easily by right and left handed operators without having to change the position of the hands, even when wearing gloves. The dead man's control must be capable of withstanding 6000 endurance cycles, one cycle consisting of opening and closing the tool.

Lighted Carrying Handle

To assist the operator and increase safety while working in dark or poorly lit circumstances the carrying handle shall have integrated LED lights. The lights shall be focused on the working area of the tool and shall be completely weatherproof. Lights should be powered by a field replaceable single AA battery and shall provide a minimum of six continuous hours of illumination. The distance between the dead man's handle and the U-shaped carrying handle will be at least 9" (229 mm) to provide a natural position for both hands during operation and to allow for complete control of the tool. The tool shall remain in a balanced horizontal position when held only by the carrying handle. In order to provide improved grip in all weather conditions, the carrying handle must have a non-slip surface.

Safety and Protection

For maximum safety of the operator, all cutters, spreaders and rams shall contain a safety relief valve to protect the tool against sudden load shift. All moving parts such as yoke and levers must be protected by a cover for the safety of the operator.

Hinge bolt system

To allow greater access into tight spaces the cutter will contain a low profile locking hinge bolt system that does not extend beyond the blade holder profile. Bolt head and nut construction that protrude and impede tool operation are not acceptable. This low profile system allows greater precision and control on every cut by locking the factory set torque value. For ease of maintenance, the hinge bolt system must require a torque of no more than 38 ft-lb (50Nm). For extended tool life the cutter shall have a set of corrosion resistant steel covers in place to shield the front of the tool from damage during the extrication operation.

Blades

The blades of the cutter will be fabricated from high grade tool steel, hardened to improve durability. The blades shall be manufactured from forged bar stock by CNC machining technology. The blades will be constructed so as to be re-grindable. The blades will be manufactured with a recess in the cutting edge of ∅ 28mm (1.1") The NFPA 1936 performance level rating for this tool shall be: A6 B3 C5 D6 E5.

Pump

Hydraulic power must be delivered from a gasoline or electrically driven pump. Alternatively, a manually operated pump or an air driven pump may be used. To provide maximum ease of use (lightest weight) to the operator the pump must be a completely separate unit from the rescue tool.

Forces

The maximum cutting force exerted will be no less than 63,400 lbf. (282 kN) in the recess, and 41,000 lbs. (182.4 kN) in the blade's center.

Weight & Dimensions

The weight of an operable tool may not exceed 24 lbs. (10.9 kg) including hydraulic oil. The maximum opening of the blades will be no less than 5¼" (134 mm) measured at the tips. The length of the tool is not to exceed 27" (686 mm); width not to exceed 9 5/16" (236 mm); height not to exceed 7½" (190 mm).

Corrosion & Wear Protection

Internal and external aluminum parts of the tool that are susceptible to wear or corrosion must be anodized to provide maximum durability. The tool must be capable of withstanding a 10-day salt spray test, and still be able to function normally.

Lifetime Warranty

The manufacturer shall warrant this tool against all defects in material and workmanship for as long as owned by the original purchaser.

4050-NCT RESCUE CUTTER

General

The tool must be **UL Listed**: This tool must have successfully completed the rescue tool test program certified by Underwriters Laboratories, Inc. The tool must be capable of withstanding a static over-load pressure of twice the working pressure. This 2:1 over-load ratio is a UL requirement to provide maximum safety to the operator. This tool must ***also*** be compliant with NFPA 1936 Standard on Powered Rescue Tools, 2005 edition. The tool must be a "one-person" operated lightweight tool, which means that one person will be able to position, guide and operate the tool without the assistance of other people. For this reason the tool will be equipped with a carrying handle, which allows the operator to keep the tool evenly balanced in all positions even with one hand. To eliminate connection errors and reduce deployment time, the tool shall be designed for use and supplied with a factory installed single, compact hydraulic coupler. This single male coupler shall incorporate a coaxial design with the pressure line inside of the return line, allowing for simultaneous connection of both lines with one connection motion. The coupler must be of a flat-face, non-drip style, with a protective aluminum dust cap attached to the tool. This coupler shall be located to the rear of the deadman's handle, in line with the center axis of the tool, avoiding hindrance to the operator.

Dead man's handle

The tool must be activated by means of a rotary deadman's handle grip, operated by a twist of the wrist. For ease of operation, the handle shall have a maximum rotation of 20° in either direction. When the deadman's handle grip is released, it must return to the neutral position automatically. The deadman's handle design will provide one-handed ergonomic control of opening and closing functions that does not rely on thumb (single digit) operation. The deadman's handle shall provide 360° access to the operator allowing operation of the tool in any position. The deadman's handle must be located in such a way that it can be operated, guided and supported easily by right and left handed operators without having to change the position of the hands, even when wearing gloves. The deadman's control must be capable of withstanding 6000 endurance cycles, one cycle consisting of opening and closing the tool.

Lighted Carrying Handle

To assist the operator and increase safety while working in dark or poorly lit circumstances the carrying handle shall have integrated LED lights. The lights shall be focused on the working area of the tool and shall be completely weatherproof. Lights should be powered by a field replaceable single AA battery and shall provide a minimum of six continuous hours of illumination. The distance between the dead man's handle and the U-shaped carrying handle will be at least 12" (305 mm) to provide a natural position for both hands during operation and to allow for complete control of the tool. The tool shall remain in a balanced horizontal position when held only by the carrying handle. In order to provide improved grip in all weather conditions, the carrying handle must have a non-slip surface.

Safety and Protection

For maximum safety of the operator all cutters, spreaders and rams shall contain a safety relief valve to protect the tool against sudden load shift. All moving parts such as yoke and levers must be protected by a cover for the safety of the operator.

Hinge bolt system

To allow better access into tight spaces the cutter will contain a low profile locking hinge bolt system that does not extend beyond the blade holder profile. The bolt and nut must be secured by means of two adjustable interlocking rings that are recessed and protected from damage. Any hinge bolt systems that use any style of lock washers, or lock nuts are not acceptable. Bolt heads or nuts that protrude beyond the blade holders and impede tool operation are not acceptable. This low profile, hinge bolt locking system allows greater precision and control on every cut. For ease of maintenance, the hinge bolt system must not use any blade shims, and the factory recommended

torque may not exceed 38 ft-lb (50Nm). For extended tool life the cutter shall have a set of corrosion resistant steel covers in place to shield the blade holders from damage.

Blades

The blades of the cutter will be fabricated from high grade tool steel, hardened to improve durability. The blades shall be manufactured from forged bar stock by CNC machining technology. The design of the blade shall be derived to meet the requirement of today's rescuer facing *New Car Technology*. The blades will be constructed so as to be re-grindable.

Pump

Hydraulic power at a maximum pressure of 10,500 psi (720 bar) must be delivered from a gasoline or an electrically driven pump. Alternatively, a manually operated pump or an air driven pump may be used. To provide maximum ease of use (lightest weight) to the operator, the pump must be a completely separate unit from the rescue tool.

Forces

The maximum cutting force exerted will be no less than 208,000 lbf. (927 kN) in the recess of the blades, near the hinge bolt. The NFPA performance level rating for this tool shall be A8 B7 C7 D8 E9.

Weight and dimensions

The maximum opening of the blades will be no less than 7 1/8" (181 mm) measured at the tips. Length of tool not to exceed 31" (789 mm); Width not to exceed 10 3/8" (264 mm); Height not to exceed 7 5/8" (194 mm). Weight ready to use not to exceed 39 lbs (37.4 kg).

Corrosion and wear protection

Internal and external aluminum parts of the tool that are susceptible to wear or corrosion must be protected by anodization to provide maximum durability. The tool must be capable of withstanding a 10 day salt spray test, and still be able to function normally.

Lifetime Warranty

The manufacturer shall warrant this tool against all defects in material and workmanship for as long as owned by the original purchaser.

3005 Mini Cutter

General

The tool must be capable of withstanding a static over-load pressure of twice the working pressure. The tool must be a "one-person" operated lightweight tool, which means that one person will be able to position, guide and operate the tool without the assistance of other people. Couplers must be one hand operated, flat-face, non-drip couplings with built-in automatic locking feature. Couplers must be supplied with aluminum protective dust caps. Pigtail hoses will be connected to the rear of the deadman's handle, leading away in line with the tool avoiding hindrance to the operator. Pigtail hose connection shall be protected so that the connection is not accessible or susceptible to damage. Pigtail hoses shall be equipped with full-length, spring-type, protective bend restrictors.

Deadman's Handle

The tool must be activated by means of a toggle-type, push button deadman's handle, operated by depressing the push button by one's thumb or fingers. When the deadman's push button is released, it must return to the neutral position automatically. The deadman's push button will provide one-handed control of opening and closing functions. The deadman's push button must be located in such a way that it can be operated, guided and supported easily by right and left handed operators without having to change the position of the hands, even when wearing gloves. The deadman's push button shall be inset into the handle in such a way that inadvertent activation is not possible.

Safety and Protection

For maximum safety of the operator the cutter shall contain a safety relief valve to protect the tool against over pressurization caused by accidentally disconnecting the return line of the tool. The tool shall have a built in no return check valve to hold the load when used to spread or push.

Blades

The blades of the cutter will be fabricated from high grade tool steel, hardened to improve durability. The blades will be constructed so as to be re-grindable. The blades will be manufactured with serrations in the cutting edge. The outside edge of the blades will have serrations to allow for spreading/pushing operations.

Pump

Hydraulic power must be delivered from a gasoline or electrically driven pump. Alternatively, a manually operated pump or an air driven pump may be used. To provide maximum ease of use (lightest weight) to the operator the pump must be a completely separate unit from the rescue tool.

Forces

The maximum cutting force exerted will be no less than 29,225 lbf.(130 kN). The maximum spreading force exerted will be no less than 7,000 lbf. (31 kN).

Weight & Dimensions

The weight of an operable tool may not exceed 8 lbs. (3.6kg) including hydraulic oil. The maximum opening of the blades will be no less than 1 ½ " (40 mm) measured at the tips. The length of the tool not including hose bend radius is not to exceed 13"(327mm). Width not to exceed 2 ¾"(68 mm). Height not to exceed 5" (125 mm).

Corrosion & Wear Protection

Internal and external aluminum parts of the tool that are susceptible to wear or corrosion must be anodized to provide maximum durability.

4242 27" Rescue Spreader

General

The tool must be UL listed. This tool must have successfully completed the rescue tool test program certified by Underwriters Laboratories, Inc. The tool must be capable of withstanding a static over-load pressure of twice the working pressure. This 2:1 over-load ratio is a UL requirement to provide maximum safety to the operator This tool must also be compliant with NFPA 1936 Standard on Powered Rescue Tools, 2005 edition. The tool must be capable of withstanding a static over-load pressure of twice the working pressure. This 2:1 over-load ratio is a requirement to provide maximum safety to the operator. The tool must be a "one-person" operated lightweight tool, which means that one person will be able to position, guide and operate the tool without the assistance of other people. For this reason the tool will be equipped with a carrying handle, which allows the operator to keep the tool evenly balanced in all positions even with one hand. To eliminate connection errors and reduce deployment time the tool shall be supplied with only one compact hydraulic coupler. This single coupler shall have a coaxial design with the pressure line inside of the return line to allow for rapid simultaneous connection of both lines with one connection motion. The coupler design shall incorporate an automatic return valve to permit connection and disconnection of the tool to the hose while under flow. The coupler must be a flat-face, non-drip coupling with built-in automatic locking feature and be one hand operated. Coupler must be supplied with a protective aluminum dust cap. The hose connection will be to the rear of the dead man's handle, leading away in line with the center axis of the tool, avoiding hindrance to the operator.

Dead man's Handle

The tool must be activated by means of a rotary dead man's handle, operated by a twist of the wrist. For ease of operation, the handle shall have a maximum rotation of 20° in either direction. When the dead man's handle is released, it must return to the neutral position automatically. The dead man's handle will provide one-handed control of opening and closing functions. The dead man's handle shall provide 360 degree access to the operator allowing operation of the tool in any position. The deadman's handle must be located in such a way that it can be operated, guided and supported easily by right and left handed operators without having to change the position of the hands, even when wearing gloves. The dead man's control must be capable of withstanding 6000 endurance cycles, one cycle consisting of opening and closing the tool.

Carrying Handle

The distance between the dead man's handle and the U-shaped carrying handle will be no less than 10 ½" (267 mm) to provide a natural position for both hands during operation and to allow for complete control of the tool. The tool shall remain in a balanced horizontal position when held only by the carrying handle. In order to provide improved grip in all weather conditions, the carrying handle must have a non-slip surface. To assist the operator and increase safety while working in dark or poorly lit circumstances the carrying handle shall have integrated LED lights. The lights shall be focused on the working area of the tool and shall be completely weatherproof. Lights should be powered by a field replaceable single AA battery and shall provide a minimum of six continuous hours of illumination.

Safety and Protection

For maximum safety of the operator all cutters, spreaders and rams shall contain a safety relief valve to protect the tool against over pressurization caused by sudden load shift on the tool. The tool will have automatic, non-return check valves built in so that the tool will hold the load when the dead man's handle is released, whether the tool is

spreading or pulling. If pressure should drop because of interruption of the power source for any reason, the tool must hold the load. All moving parts such as yoke and levers must be protected by a cover for the safety of the user.

Arms

The arms and yoke of the spreader must be manufactured out of extremely high tensile aluminum alloy, anodized to offer protection against corrosion. The arms of the spreader will be equipped with investment cast hardened tool steel tips, specially designed for quick field replacement without the use of any tools. Spring-loaded tip locking pins will be incorporated into the arms so that no loose parts can be lost. The tips will have serrations on both the inside and the outside for a superior grip in spreading or crushing operations.

Pump

Hydraulic power must be delivered from a gasoline or electrically driven pump. Alternatively, a manually operated pump or an air driven pump may be used. To provide maximum ease of use (lightest weight) to the operator the pump must be a completely separate unit from the rescue tool.

Forces

The arms of the spreader will have a maximum opening width of 27¼" (692 mm), must exert no less than 8,800 lbf (39.1 kN) at the tips, and at least 19,595 lbf (87.2 kN) at the base of the tips. Maximum pulling force at full opening will be at least 11,200 lbf (49.8 kN).

Method of Measuring Forces

The spreading force must be measured at the effective tip area on the moving arms, perpendicular to the centerline of the tool when in an unfixed state. This measurement of force measures the actual force created by the tool when used by the operator.

Weight & Dimensions

The weight of the ready-for-use tool may not exceed 39 lbs (17.7 kg) including hydraulic oil. Length of not to exceed 30½" (773 mm). Width not to exceed 11¾" (297 mm). Height not to exceed 8 1/8" (206 mm)

Accessories

The following accessories will be available:

-Pulling attachments

Pulling adapters and chains will be provided for pulling operations. The adapters must have the same quick-change design as the spreading tips. Pulling chains will be equipped with shortening hooks. Safety factor of the chain set will be at least 2 times the maximum pulling force of the tool.

-Cutting Tip

An optional cutting tip for cutting sheet metals will be available. The cutting tip must have the same quick-change design as the spreading tips.

Corrosion & Wear Protection

Internal and external aluminum parts of the tool that are susceptible to wear or corrosion must be protected by anodization to provide maximum durability. The tool must be capable of withstanding a 10 day salt spray test, and still be able to function normally.

4260-UL 32" Rescue Spreader

General

The tool must be UL listed. This tool must have successfully completed the rescue tool test program certified by Underwriters Laboratories, Inc. The tool must be capable of performing 1000 endurance cycles, whereby one cycle consists of completely opening and closing the tool at its maximum pressure during its stroke. The tool must be capable of withstanding a static over-load pressure of twice the working pressure. This 2:1 over-load ratio is a UL requirement to provide maximum safety to the operator. This tool must also be compliant with NFPA 1936 Standard On Powered Rescue Tool Systems, 1999 edition. The tool must be a "one-person" operated lightweight tool, which means that one person will be able to position, guide and operate the tool without the assistance of other people. For this reason the tool will be equipped with a carrying handle, which allows the operator to keep the tool evenly balanced in all positions even with one hand. Couplers must be one hand operated, flat-face, non-drip couplings with built-in automatic locking feature. Couplers must be supplied with aluminum protective dust caps. Pigtail hoses will be connected to the rear of the deadman's handle, leading away in line with the tool avoiding hindrance to the operator. Pigtail hose connection shall be protected so that the connection is not accessible or susceptible to damage. Pigtail hoses shall be equipped with full-length, spring-type, protective bend restrictors.

Deadman's Handle

The tool must be activated by means of a rotary deadman's handle, operated by a twist of the wrist. For ease of operation, the handle shall have a maximum rotation of 20° in either direction. When the deadman's handle is released, it must return to the neutral position automatically. The deadman's handle will provide one-handed control of opening and closing functions. The deadman's handle shall provide 360 degree access to the operator allowing operation of the tool in any position. The deadman's handle must be located in such a way that it can be operated, guided and supported easily by right and left handed operators without having to change the position of the hands, even when wearing gloves. The deadman's control must be capable of withstanding 6000 endurance cycles, one cycle consisting of opening and closing the tool.

Carrying Handle

The distance between the deadman's handle and the U-shaped carrying handle will be no less than 12" (305 mm) to provide a natural position for both hands during operation and to allow for complete control of the tool. The tool shall remain in a balanced horizontal position when held only by the carrying handle. In order to provide improved grip in all weather conditions, the carrying handle must have a non-slip surface.

Safety and Protection

For maximum safety of the operator all cutters, spreaders and rams shall contain a safety relief valve to protect the tool against over pressurization caused by accidentally disconnecting the return line of the tool. The tool will have automatic, non-return check valves built in so that the tool will hold the load when the deadman's handle is released, whether the tool is spreading or pulling. If pressure should drop because of interruption of the power source for any reason, the tool must hold the load. All moving parts such as yoke and levers must be protected by a cover for the safety of the user.

Arms

The arms and yoke of the spreader must be manufactured out of extremely high tensile aluminum alloy, anodized to offer protection against corrosion.The arms of the spreader will be equipped with investment cast hardened tool steel tips, specially designed for quick field replacement without the use of any tools. Spring-loaded tip locking pins will be incorporated into the arms so that no loose parts can be lost. The tips will have serrations on both the inside and the outside for a superior grip in spreading or crushing operations.

Pump

Hydraulic power must be delivered from a gasoline or electrically driven pump. Alternatively, a manually operated pump or an air driven pump may be used. To provide maximum ease of use (lightest weight) to the operator the pump must be a completely separate unit from the rescue tool.

Forces

The arms of the spreader will have a maximum opening width of 32 ¾" (832 mm), must exert no less than 33,000 lbf (146.8 kN) of force in the base of the tips at maximum opening. Maximum pulling force shall be no less than 14,300 lbf (63.6 kN).

Method of Measuring Forces

The spreading force must be measured at the effective tip area on the moving arms, perpendicular to the centerline of the tool when in an unfixed state. This measurement of force was calculated and approved by UL and measures the actual force created by the tool when used by the operator.

Weight & Dimensions

The weight of the ready-for-use tool may not exceed 58.5 lbs (27 kg) including hydraulic oil. Length of tool including hose bend radius not to exceed 37½" (953 mm). Width not to exceed 12 ½ " (318 mm). Height not to exceed 9 ¼" (235 mm)

Accessories

The following accessories will be available:

-Pulling attachments

Pulling adapters and chains will be provided for pulling operations. The adapters must have the same quick-change design as the spreading tips. Pulling chains will be equipped with shortening hooks. Safety factor of the chain set will be at least 2 times the maximum pulling force of the tool.

-Cutting Tip

An optional cutting tip for cutting sheet metals will be available. The cutting tip must have the same quick-change design as the spreading tips.

Corrosion & Wear Protection

Internal and external aluminum parts of the tool that are susceptible to wear or corrosion must be protected by anodization to provide maximum durability. The tool must be capable of withstanding a 10 day salt spray test, and still be able to function normally.

4321-UL Small Single Plunger Rescue Ram

General

The tool must be UL listed. This tool must have successfully completed the rescue tool test program certified by Underwriters Laboratories, Inc. The tool must be capable of performing 1000 endurance cycles, whereby one cycle consists of completely opening and closing the tool at its maximum pressure during its stroke. The tool must be capable of withstanding a static over-load pressure of twice the working pressure. This 2:1 over-load ratio is a UL requirement to provide maximum safety to the operator. This tool must also be compliant with NFPA 1936 Standard On Powered Rescue Tool Systems, 1999 edition. The tool must be a "one-person" operated lightweight tool, which means that one person will be able to position, guide and operate the tool without the assistance of other people. Couplers must be one hand operated, flat-face, non-drip couplings with built-in automatic locking feature. Couplers must be supplied with aluminum protective dust caps. Pigtail hoses will be connected to the rear of the deadman's handle, leading away in line with the tool avoiding hindrance to the operator. Pigtail hose connection shall be protected so that the connection is not accessible or susceptible to damage. The end of the plunger will have a twist-lock design to accept interchangeable tool accessories. Likewise, the rear of the tool shall have a twist-lock design to accept extension pipes. Tool shall be delivered with two diamond shaped grip heads designed to prevent off-center loads. Pigtail hoses shall be equipped with full-length, spring-type, protective bend restrictors.

Deadman's Handle

The tool must be activated by means of a rotary deadman's handle, operated by a twist of the wrist. For ease of operation, the handle shall have a maximum rotation of 20° in either direction. When the deadman's handle is released, it must return to the neutral position automatically. The deadman's handle will provide one-handed control of opening and closing functions. The deadman's handle shall provide 360 degree access to the operator allowing operation of the tool in any position. The deadman's handle must be located in such a way that it can be operated, guided and supported easily by right and left handed operators without having to change the position of the hands, even when wearing gloves. The deadman's control must be capable of withstanding 6000 endurance cycles, one cycle consisting of opening and closing the tool. In addition, the ram must be able to rotate under load to allow the operating handle to be moved out of the way for patient removal.

Safety and Protection

When the ram plunger is fully extended and under maximum load, the safety factor against bending or buckling must be at least 2:1. For maximum safety of the operator all cutters, spreaders and rams shall contain a safety relief valve to protect the tool against over pressurization caused by accidentally disconnecting the return line of the tool. The tool will have automatic, non-return check valves built in so that the tool will hold the load when the deadman's handle is released, whether the tool is spreading or pulling. If pressure should drop because of interruption of the power source for any reason, the tool must hold the load.

Pump

Hydraulic power must be delivered from a gasoline or electrically driven pump. Alternatively, a manually operated pump or an air driven pump may be used. To provide maximum ease of use (lightest weight) to the operator the pump must be a completely separate unit from the rescue tool.

Forces

The ram will have a maximum pushing force of no less than 36,460 lbf (162.2 kN) and a maximum pulling force of no less than 11,265 lbf (50.1 kN).

Weight & Dimensions

Length of closed tool not to exceed 21 ¼" (539 mm).
Length of extended tool not to exceed 31" (787mm).
Width not to exceed 15 7/8" (404 mm).
Height not to exceed 4¾" (121 mm)
Net stroke not less than 9 ¾" (248 mm).
Weight not to exceed 29¾ lbs (13.5 kg).

Accessories

All accessories shall be of a twist lock design. *No threading and/or loose locking pins are allowed.*

-Pulling attachments

Pulling adapters and chains will be provided for pulling operations. The adapters must have a quick-change design. Pulling chains will be equipped with shortening hooks. Safety factor of the chain set will be at least 2 times the maximum pulling force of the tool

-Attachments

-Wedge tip for splitting.
-Conical point for piercing holes in sheet materials.
-Round flat base min. diameter 4 ½ " (115 mm) for better distribution of the forces.

-Extension Pipes

Extension pipes in the following lengths will be available for pushing operations:
6 ½" (165 mm), 13" (330 mm) and 23 ½" (597 mm)

-Ram Support Unit

Provides firm surface to allow for full extension and effectiveness of the ram during pushing operations such as dash displacements.

Corrosion & Wear Protection

Internal and external aluminum parts of the tool that are susceptible to wear or corrosion must be protected by anodization to provide maximum durability. The tool must be capable of withstanding a 10 day salt spray test, and still be able to function normally.

4331 LARGE SINGLE PLUNGER RAM

General

The tool must be UL Listed: This tool must have successfully completed the rescue tool test program certified by Underwriters Laboratories, Inc. The tool must be capable of withstanding a static over-load pressure of twice the working pressure. This 2:1 over-load ratio is a UL requirement to provide maximum safety to the operator. This tool must ***also*** be compliant with NFPA 1936 Standard on Powered Rescue Tools, 2005 edition. The tool must be a "one-person" operated lightweight tool, which means that one person will be able to position, guide and operate the tool without the assistance of other people. For this reason the tool will be equipped with a carrying handle, which allows the operator to keep the tool evenly balanced in all positions even with one hand. To eliminate connection errors and reduce deployment time the tool shall be supplied with only one hydraulic coupler. This single coupler shall have a coaxial design with the pressure line inside of the return line to allow for rapid simultaneous connection of both lines with one connection motion. To avoid hindrance to the operator the coupler must be extremely compact and lightweight. The coupler design shall incorporate an automatic return valve to permit connection and disconnection of the tool to the hose *while under flow*. The coupler must be a flat-face, non-drip coupling with built-in automatic locking feature and be one hand operated. The coupler shall permit an unhindered 360° rotation at the connection point to avoid twisting or stressing the hose. Coupler must be supplied with a protective aluminum dust cap. The hose connection point will be to the rear of the dead man's handle, leading away in line with the center axis of the tool, avoiding interference with the operation of the tool.

Deadman's Handle

The tool must be activated by means of a rotary dead man's handle, operated by a twist of the wrist. For ease of operation, the handle shall have a maximum rotation of 20° in either direction. When the dead man's handle is released, it must return to the neutral position automatically. The dead man's handle will provide one-handed control of opening and closing functions. The dead man's handle shall provide 360 degree access to the operator allowing operation of the tool in any position. The dead man's handle must be located in such a way that it can be operated, guided and supported easily by right and left handed operators without having to change the position of the hands, even when wearing gloves. The dead man's control must be capable of withstanding 6000 endurance cycles, one cycle consisting of opening and closing the tool. In addition, the ram must be able to rotate under load to allow the operating handle to be moved out of the way for patient removal.

Safety and Protection

When the ram plunger is fully extended and under maximum load, the safety factor against bending or buckling must be at least 2:1. For maximum safety of the operator all cutters, spreaders and rams shall contain a safety relief valve to protect the tool against over pressurization caused by sudden load shift on the tool. The tool will have automatic, non-return check valves built in so that the tool will hold the load when the dead man's handle is released, whether the tool is spreading or pulling. If pressure should drop because of interruption of the power source for any reason, the tool must hold the load.

Pump

Hydraulic power must be delivered from a gasoline or electrically driven pump. Alternatively, a manually operated pump or an air driven pump may be used. To provide

maximum ease of use (lightest weight) to the operator the pump must be a completely separate unit from the rescue tool.

Grip Heads

The end of the plunger will have a twist-lock design to allow rotation of the grip heads even when the tool is under a load. Rams with threaded grip heads that could become corroded and prevent use of interchangeable accessories shall not be acceptable. The twist-lock design shall accept interchangeable tool accessories. Likewise, the rear of the tool shall have a twist-lock design to also accept extension pipes. Tool shall be delivered with two diamond shaped grip heads designed to prevent off-center loads.

Forces

The ram will have a maximum pushing force of no less than 36,460 lbf (162.2 kN) and a maximum pulling force of no less than 11,265 lbf (50.1 kN).

Weight & Dimensions

Length of closed tool not to exceed 25¼" (642 mm).
Length of extended tool not to exceed 39" (991mm).
Width not to exceed 13½" (338 mm).
Height not to exceed 4 7/8" (122 mm)
Net stroke not less than 13 ¾" (349 mm).
Weight not to exceed 31 lbs (14 kg).

Accessories

All accessories shall be of a twist lock design. *No threading and/or loose locking pins are allowed.*

-Pulling attachments

Pulling adapters and chains will be provided for pulling operations. The adapters must have a quick-change design. Pulling chains will be equipped with shortening hooks. Safety factor of the chain set will be at least 2 times the maximum pulling force of the tool

-Attachments

-Wedge tip for splitting.
-Conical point for piercing holes in sheet materials.
-Round flat base min. diameter 4 ½ " (115 mm) for better distribution of the forces.

-Extension Pipes

Extension pipes in the following lengths will be available for pushing operations:
6 ½" (165 mm), 13" (330 mm) and 23 ½" (597 mm)

-Ram Support Unit

Provides firm surface to allow for full extension and effectiveness of the ram during pushing operations such as dash displacements.

Corrosion & Wear Protection

Internal and external aluminum parts of the tool that are susceptible to wear or corrosion must be protected by anodization to provide maximum durability. The tool must be capable of withstanding a 10 day salt spray test, and still be able to function normally.

Lifetime Warranty

The manufacturer shall warrant this tool against all defects in material and workmanship for as long as owned by the original purchaser.

Forces

The first plunger will have a maximum pushing force of no less than 49,145 lbf (218.6 kN). The second plunger will have a maximum pushing force of no less than 18,210 lbf (81 kN).

Weight & Dimensions

Length of closed tool not to exceed 12" (305 mm).
Length of extended tool not to exceed 23 " (584 mm).
Width not to exceed 16 ½" (420 mm),
Height not to exceed 6 1/8 " (155 mm)
Stroke of first plunger 6 1/8 " (155 mm).
Stroke of second plunger 4 7/8 " (124 mm).
Weight not to exceed 27 lbs (12kg).

Corrosion & Wear Protection

Internal and external aluminum parts of the tool that are susceptible to wear or corrosion must be protected by anodization to provide maximum durability. The tool must be capable of withstanding a 10 day salt spray test, and still be able to function normally.

Accessories

-Ram Support Unit

Provides firm surface to allow for full extension and effectiveness of the ram during pushing operations such as dash displacements.

4350 Large Telescopic Rescue Ram

General

This tool must also be compliant with NFPA 1936 Standard on Powered Rescue Tools, 2005 edition. The tool must be capable of performing 1000 endurance cycles, whereby one cycle consists of completely opening and closing the tool at its maximum pressure during its stroke. The tool must be capable of withstanding a static over-load pressure of twice the working pressure. This 2:1 over-load ratio is a requirement to provide maximum safety to the operator. The tool must be a "one-person" operated lightweight tool, which means that one person will be able to position, guide and operate the tool without the assistance of other people. For this reason the tool will be equipped with a carrying handle, which allows the operator to keep the tool evenly balanced in all positions even with one hand. To eliminate connection errors and reduce deployment time the tool shall be supplied with only one compact hydraulic coupler. This single coupler shall have a coaxial design with the pressure line inside of the return line to allow for rapid simultaneous connection of both lines with one connection motion. The coupler design shall incorporate an automatic return valve to permit connection and disconnection of the tool to the hose while under flow. The coupler must be a flat-face, non-drip coupling with built-in automatic locking feature and be one hand operated. Coupler must be supplied with a protective aluminum dust cap. The hose connection will be to the rear of the dead man's handle, leading away in line with the center axis of the tool, avoiding hindrance to the operator.

Dead man's Handle

The tool must be activated by means of a rotary dead man's handle, operated by a twist of the wrist. For ease of operation, the handle shall have a maximum rotation of 20° in either direction. When the dead man's handle is released, it must return to the neutral position automatically. The dead man's handle will provide one-handed control of opening and closing functions. The dead man's handle shall provide 360 degree access to the operator allowing operation of the tool in any position. The dead man's handle must be located in such a way that it can be operated, guided and supported easily by right and left handed operators without having to change the position of the hands, even when wearing gloves. The dead man's control must be capable of withstanding 6000 endurance cycles, one cycle consisting of opening and closing the tool. In addition, the ram must be able to rotate under load to allow the operating handle to be moved out of the way for patient removal.

Carrying Handle

To assist in carrying and positioning of the rescue ram it shall be supplied with a carrying handle.

Safety and Protection

When both ram plungers are fully extended and under maximum load, the safety factor against bending or buckling must be at least 2:1. For maximum safety of the operator all cutters, spreaders and rams shall contain a safety relief valve to protect the tool against over pressurization caused by sudden load shift on the tool. The tool will have automatic, non-return check valves built in so that the tool will hold the load when the dead man's handle is released. If pressure should drop because of interruption of the power source for any reason, the tool must hold the load.

Pump

Hydraulic power must be delivered from a gasoline or electrically driven pump. Alternatively, a manually operated pump or an air driven pump may be used. To

provide maximum ease of use (lightest weight) to the operator the pump must be a completely separate unit from the rescue tool.

Grip Heads

The ends of the plungers will have non-threaded connections of the grip heads to allow rotation of the tool even when the tool is under a load. Tool shall be delivered with two diamond shaped grip heads designed to prevent off-center loads.

Forces

The first plunger will have a maximum pushing force of no less than 49,145 lbf (218.6 kN). The second plunger will have a maximum pushing force of no less than 18,210 lbf (81 kN).

Weight & Dimensions

Length of closed tool not to exceed 21" (533 mm).
Length of extended tool not to exceed 50 ¼ " (1276 mm).
Width not to exceed 13¾" (350 mm),
Height not to exceed 6 1/8" (156 mm)
Stroke of first plunger 15 ¼ " (387 mm).
Stroke of second plunger 14" (356 mm).
Weight not to exceed 37 lbs (16.8 kg).

Corrosion & Wear Protection

Internal and external aluminum parts of the tool that are susceptible to wear or corrosion must be protected by anodization to provide maximum durability. The tool must be capable of withstanding a 10 day salt spray test, and still be able to function normally.

Accessories

-Ram Support Unit

Provides firm surface to allow for full extension and effectiveness of the ram during pushing operations such as dash displacements.

Lifetime Warranty

The manufacturer shall warrant this tool against all defects in material and workmanship for as long as owned by the original purchaser.

HRS 22
RAM SUPPORT UNIT

General

The ram support must prevent the ram from sliding by providing a firm surface to allow for full extension and effectiveness of the ram. Various bars crossing the frame allow for the ram to be supported at various lengths, locations, and angles.

Weight & Dimensions

The support must be 15 ¾" (400 mm) in length, 4 1/8" (105 mm) in width, and 9 ½" (240mm) in height to allow for optimum performance. The support must be made of steel with zinc plating. Weight is to be no greater than 19 lbs (8.6 kg).

4150 Heavy Duty Rescue Combi Tool

General

The tool must be **UL Listed**: This tool must have successfully completed the rescue tool test program certified by Underwriters Laboratories, Inc. The tool must be capable of withstanding a static over-load pressure of twice the working pressure. This 2:1 over-load ratio is a UL requirement to provide maximum safety to the operator. This tool must ***also*** be compliant with NFPA 1936 Standard on Powered Rescue Tools, 2005 edition. The tool must be a "one-person" operated lightweight tool, which means that one person will be able to position, guide and operate the tool without the assistance of other people. For this reason the tool will be equipped with a carrying handle, which allows the operator to keep the tool evenly balanced in all positions even with one hand. To eliminate connection errors and reduce deployment time the tool shall be supplied with only one hydraulic coupler. This single coupler shall have a coaxial design with the pressure line inside of the return line to allow for rapid simultaneous connection of both lines with one connection motion. To avoid hindrance to the operator the coupler must be extremely compact and lightweight. The coupler design shall incorporate an automatic return valve to permit connection and disconnection of the tool to the hose *while under flow*. The coupler must be a flat-face, non-drip coupling with built-in automatic locking feature and be one hand operated. The coupler shall permit an unhindered 360° rotation at the connection point to avoid twisting or stressing the hose. Coupler must be supplied with a protective aluminum dust cap. The hose connection point will be to the rear of the dead man's handle, leading away in line with the center axis of the tool, avoiding interference with the operation of the tool.

Dead man's Handle

The tool must be activated by means of a rotary dead man's handle grip, operated by a twist of the wrist. For ease of operation, the handle shall have a maximum rotation of 20° in either direction. When the dead man's handle grip is released, it must return to the neutral position automatically. The dead man's handle design will provide one-handed ergonomic control of opening and closing functions that does not rely on thumb (single digit) operation. The dead man's handle shall provide 360° access to the operator allowing operation of the tool in any position. The dead man's handle must be located in such a way that it can be operated, guided and supported easily by right and left handed operators without having to change the position of the hands, even when wearing gloves. The dead man's control must be capable of withstanding 6000 endurance cycles, one cycle consisting of opening and closing the tool.

Lighted Carrying Handle

To assist the operator and increase safety while working in dark or poorly lit circumstances the carrying handle shall have integrated LED lights. The lights shall be focused on the working area of the tool and shall be completely weatherproof. Lights should be powered by a field replaceable single AA battery and shall provide a minimum of six continuous hours of illumination. The distance between the dead man's handle and the U-shaped carrying handle will be at least 10" (254 mm) to provide a natural position for both hands during operation and to allow for complete control of the tool. The tool shall remain in a balanced horizontal position when held only by the carrying handle. In order to provide improved grip in all weather conditions, the carrying handle must have a non-slip surface.

Safety and Protection

For maximum safety of the operator all cutters, spreaders and rams shall contain a safety relief valve to protect the tool against over pressurization caused by accidentally disconnecting the return line of the tool. The tool will have automatic, non-return check valves built in so that the tool will hold the load when the deadman's handle is released, whether the tool is spreading or pulling. If pressure should drop because of interruption of the power source for any reason, the tool must hold the load. All moving parts such as yoke and levers must be protected by a cover for the safety of the operator.

Hinge bolt system

To allow better access into tight spaces the cutter will contain a low profile locking hinge bolt system that does not extend beyond the blade holder profile. Bolt head and nut construction that protrude and impede tool operation are not acceptable. This low profile system allows greater precision and control on every cut by locking the factory set torque value. For ease of maintenance, the hinge bolt system must require a torque of no more then 38 ft-lb (50Nm). For extended tool life the cutter shall have a set of corrosion resistant steel covers in place to shield the front of the tool from damage during the extrication operation.

Blades/Arms

The blades of the combi cutter will be fabricated out of high grade tool steel that is hardened to improve durability. The cutting, gripping and spreading surfaces of the blades will be regrindable to ensure a longer life span. For maximum safety and gripping when cutting, cutting edges will have specially designed half round serrations.

Pump

Hydraulic power must be delivered from a gasoline or electrically driven pump. Alternatively, a manually operated pump or an air driven pump may be used. The pump must be a completely separate unit from the rescue tool.

Forces

The maximum cutting force exerted will be no less than 67,600 lbf. (300.7 kN) in the recess. Maximum spreading force must be at least 16,166 lbf (71.9 kN). Maximum pulling force at full opening 14,358 lbf (63.9 kN). The NFPA performance level rating for this tools shall be: A6 B7 C5 D7 E5.

Method of Measuring Forces

The spreading force must be measured at the effective tip area on the moving arms, perpendicular to the center line of the tool when in an unfixed state. This measurement of force was calculated and approved by UL and measures the actual force created by the tool when used by the operator.

Weight & Dimensions

The weight of an operable tool may not exceed 31 lbs. (14 kg) including hydraulic oil. Maximum spreader opening will be no less than 14¼" (362mm). Maximum cutter opening will be 9" (229 mm). Width of spreading tips must be 1 3/16" (31mm) minimum for optimum gripping. Squeezing surface should be 1 3/16" x 2 ¼" (30mm x 57mm) minimum. Length of tool shall not exceed 31" (787 mm). Width not to exceed 9 5/16" (236 mm). Height not to exceed 7 1/2" (190 mm).

Accessories

Pulling adapters and chains will be available for pulling operations. The adapters must have a quick-lock system. Pulling chains will be equipped with shortening hooks. The strength of the chain set will be at least 2 times the maximum pulling force of the tool.

Corrosion & Wear Protection

Internal and external aluminum parts of the tool that are susceptible to wear or corrosion must be anodized to provide maximum durability. The tool must be capable of withstanding a 10-day salt spray test, and still be able to function normally.

Lifetime Warranty

The manufacturer shall warrant this tool against all defects in material and workmanship for as long as owned by the original purchaser.

Hand Operated Combi-tool

General

The tool must be capable of withstanding a static over-load pressure of twice the working pressure. This 2:1 over-load ratio is a requirement to provide maximum safety to the operator. The tool must be a "one-person" operated lightweight tool, which means that one person will be able to position, guide and operate the tool without the assistance of other people. For this reason the tool will be equipped with a carrying handle, which allows the operator to keep the tool evenly balanced in all positions even with one hand.

The tool must be activated by means of a rotary pump handle. For ease of operation, the handle shall have a maximum rotation of 90° in either direction The pump handle, in combination with the carrying handle, shall provide 360° access to the operator allowing operation of the tool in any position. The pump handle must be located in such a way that it can be operated, guided and supported easily by right and left handed operators without having to change the position of the hands, even when wearing gloves.

Carrying Handle

The distance between the pump handle and the U-shaped carrying handle will be no less than 12" (305 mm) to provide a natural position for both hands during operation and to allow for complete control of the tool. The tool shall remain in a balanced horizontal position when held only by the carrying handle. In order to provide improved grip in all weather conditions, the carrying handle must have a non-slip surface.

Safety and Protection

For maximum safety of the operator all cutters, spreaders and rams shall contain a safety relief valve to protect the tool against over pressurization. The tool will have automatic, non-return check valves built in so that the tool will hold the load when the pump handle is released, whether the tool is spreading or pulling. If pressure should drop because of interruption of the power source for any reason, the tool must hold the load. To provide for the safety of the operator, a cover must protect all moving parts such as yoke and levers.

Blades

The blades of the cutter will be fabricated from high-grade tool steel, hardened to improve durability. The blades will be constructed so as to be re-grindable. The blades must be capable of shearing ∅ 0.95" round stock (in the recess), ∅ 1 7/8" O.D. x 0.11" tube, 1 3/4" x 1 3/4" x 3/16" square section, 2 3/8" x 1 ¼" x 3/16" rectangular section, and 3" x 3/8" steel plate.

Pump

Hydraulic power must be delivered from a built-in manually operated pump. To provide maximum ease of use to the operator the pump handle must be capable of being rotated through 180° at 30° intervals.

Forces

The maximum cutting force exerted will be no less than 49,000 lbf. (218 kN) in the recess, and 18,660 lbs (83 kN) in the middle of the blade.

Weight & Dimensions

The weight of an operable tool may not exceed 23 lbs. (10.5kg) including hydraulic oil. The maximum opening of the blades will be no less than 10 ½ "(268 mm) measured at the tips. The length of the tool is not to exceed 27 ½ " (698mm). Width not to exceed 8 1/16"(205 mm). Height not to exceed 6 7/16" (163 mm).

Corrosion & Wear Protection

Internal and external aluminum parts of the tool that are susceptible to wear or corrosion must be protected by anodize to provide maximum durability. The tool must be capable of withstanding a 10-day salt spray test, and still be able to function normally. Blades must have a method of lubrication through the hinge bolt using a grease gun.

BCT3120 Battery Operated Combi Tool

General

The tool must be capable of withstanding a static over-load pressure of twice the working pressure. This 2:1 over-load ratio is a requirement to provide maximum safety to the operator. The tool must be capable of operating as a self-contained unit without power cables for maximum portability. The tool must be a "one-person" operated lightweight tool, which means that one person will be able to position, guide and operate the tool without the assistance of other people. For this reason the tool will be equipped with a carrying handle, which allows the operator to keep the tool evenly balanced in all positions even with one hand. The tool must be able to be powered by a commercially available, portable, 24V battery weighing no more than 3 lbs. (1.4 kg.), which is attached directly to the tool with no external cables or wires. The battery must be able to be replaced rapidly without the use of any tools. The tool shall also be weather resistant.

Deadman's Handle

The tool must be activated by means of a rotary deadman's handle, operated by a twist of the wrist. For ease of operation, the handle shall have a maximum rotation of 20° in either direction. When the deadman's handle is released, it must return to the neutral position automatically. The deadman's handle will provide one-handed control of opening and closing functions. The deadman's handle shall provide 360 degree access to the operator allowing operation of the tool in any position. The deadman's handle must be located in such a way that it can be operated, guided and supported easily by right and left handed operators without having to change the position of the hands, even when wearing gloves. The deadman's control must be capable of withstanding 6000 endurance cycles, one cycle consisting of opening and closing the tool.

Carrying Handle

The distance between the deadman's handle and the U-shaped carrying handle will be no less than 10" (254 mm) to provide a natural position for both hands during operation and to allow for complete control of the tool. The tool shall remain in a balanced horizontal position when held only by the carrying handle. In order to provide improved grip in all weather conditions, the carrying handle must have a non-slip surface.

Safety and Protection

For maximum safety of the operator the combi tool shall contain safety relief valves to protect the tool against over pressurization. The tool will have automatic, non-return check valves built in so that the tool will hold the load when the deadman's handle is released, whether the tool is spreading or pulling. If pressure should drop because of interruption of the power source for any reason, the tool must hold the load. All moving parts such as yoke and levers must be protected by a cover for the safety of the operator.

Blades/Arms

The blades of the combi cutter will be fabricated out of high-grade tool steel that is hardened to improve durability. The cutting, gripping and spreading surfaces of the blades will be regrindable to ensure a longer life span. For maximum safety and gripping when cutting, cutting edges will have specially designed half round serrations. The blades must be capable of shearing ∅ 0.95" round stock (in the recess), ∅ 1.9" O.D. x 0.11" wall tube, 1 ¾ " x 1 ¾ " x 1/8" square section, 2 3/8" x 1 ¼ " x 3/16" rectangular section, and 3"x 3/8" steel plate.

Electronics
There must be electronic circuitry present to provide monitoring of the battery status and provide visual indication via flashing light when battery life is low. The electronics must allow the operator enough power to "back out" prior to expending all available power to the tool. The electronics must provide protection against motor damage, caused by over or under current.

Pump
Hydraulic power must be delivered from an internally mounted axial piston pump driven by an internal electric motor that can operate off of 12 to 24 volts DC. The pump shall produce a maximum of 10,500 psi and operate on mineral-based hydraulic oil.

Forces
The maximum cutting force exerted will be no less than 49,000 lbf. (218 kN) in the recess. Maximum spreading force must be at least 11,690 lbf (52 kN).

Weight & Dimensions
Maximum spreader opening will be no less than 10.5 " (268 mm). Maximum cutter opening will be 7.5" (191mm). The weight of an operable tool may not exceed 33 lbs. (14.8 kg) including hydraulic oil and battery. Length of tool not to exceed 28 " (712 mm). Width not to exceed 12" (305 mm). Height not to exceed 9" (230 mm).

Corrosion & Wear Protection
Internal and external aluminum parts of the tool, that are susceptible to wear or corrosion, must be anodized to provide maximum durability.

Battery & Battery Charger
Commercially available (non proprietary) Nickel Cadmium type batteries shall be supplied standard with the tool. Lead-acid batteries are not acceptable. The batteries must be recyclable through a service available in North America.
The charger shall provide rapid 1 hour charging, to 100% capacity. Chargers shall be available for 120 VAC or 12 VDC vehicle connections and shall also provide automatic trickle charging and battery conditioning.

Auxiliary Power Options
The tool must be provided standard with an auxiliary power port that allows operation from a 12 – 24 VDC source.
The tool's battery must also be able to accept an AC/DC converter.

3624 Power Wedge

General

The tool must be capable of withstanding a static over-load pressure of twice the working pressure. This 2:1 over-load ratio is requirement to provide maximum safety to the operator. The tool must be a "one-person" operated lightweight tool, which means that one person will be able to position, guide and operate the tool without the assistance of other people. For this reason the tool will be equipped with a carrying handle, which allows the operator to keep the tool evenly balanced in all positions even with one hand. Couplers must be one hand operated, flat-face, non-drip couplings with built-in automatic locking feature. Couplers must be supplied with aluminum protective dust caps. Pigtail hoses will be connected to the rear of the deadman's handle, leading away in line with the tool avoiding hindrance to the operator. Pigtail hose connection shall be protected so that the connection is not accessible or susceptible to damage. Pigtail hoses shall be equipped with full-length, spring-type, protective bend restrictors.

Deadman's Handle

The tool must be activated by means of a rotary deadman's handle, operated by a twist of the wrist. For ease of operation, the handle shall have a maximum rotation of 20° in either direction. When the deadman's handle is released, it must return to the neutral position automatically. The deadman's handle will provide one-handed control of opening and closing functions. The deadman's handle shall provide 360 degree access to the operator allowing operation of the tool in any position. The deadman's handle must be located in such a way that it can be operated, guided and supported easily by right and left handed operators without having to change the position of the hands, even when wearing gloves. The deadman's control must be capable of withstanding 6000 endurance cycles, one cycle consisting of opening and closing the tool.

Carrying Handle

The distance between the deadman's handle and the U-shaped carrying handle will be no less than 12" (305 mm) to provide a natural position for both hands during operation and to allow for complete control of the tool. The tool shall remain in a balanced horizontal position when held only by the carrying handle. In order to provide improved grip in all weather conditions, the carrying handle must have a non-slip surface.

Safety and Protection

For maximum safety of the operator all power wedges shall contain a safety relief valve to protect the tool against over-pressurization caused by accidentally disconnecting the return line of the tool. The tool will have automatic, non-return check valves built in so that the tool will hold the load when the deadman's handle is released, whether the tool is lifting or lowering. If pressure should drop because of interruption of the power source for any reason, the tool must hold the load. A cover for the safety of the user must protect all moving parts.

Blades/Wedges

The insertion plates and wedge of the power wedge must be manufactured out of extremely high tensile steel, protected against corrosion.

Pump

Hydraulic power should be delivered from a gasoline or electrically driven pump. Alternatively, a manually operated pump or an air driven pump may be used. To provide maximum ease of use (lightest weight) to the operator the pump must be a completely separate unit from the rescue tool.

Forces

The power wedge must exert a maximum lifting force of 52,900 lbs (235 kN)
The power wedge will have a maximum lifting height of 2" (50 mm), minimum opening of ¼ " (6 mm) and a maximum insertion length under the load of 2 ¼ " (60 mm).

Weight & Dimensions

The weight of the ready-for-use tool may not exceed 24 ½ lbs (11 kg) including hydraulic oil. Length of tool including hose bend radius not to exceed 29 ¼ "(743 mm). Width not to exceed 9" (229 mm). Height not to exceed 8"(203 mm). Blade width will be 2 3/8" (60 mm)

Corrosion & Wear Protection

Internal and external aluminum parts of the tool that are susceptible to wear or corrosion must be protected by anodization to provide maximum durability. The tool must be capable of withstanding a 10-day salt spray test, and still be able to function normally. The power wedge will be provided with a rubber protection cap over the insertion plates and wedge.