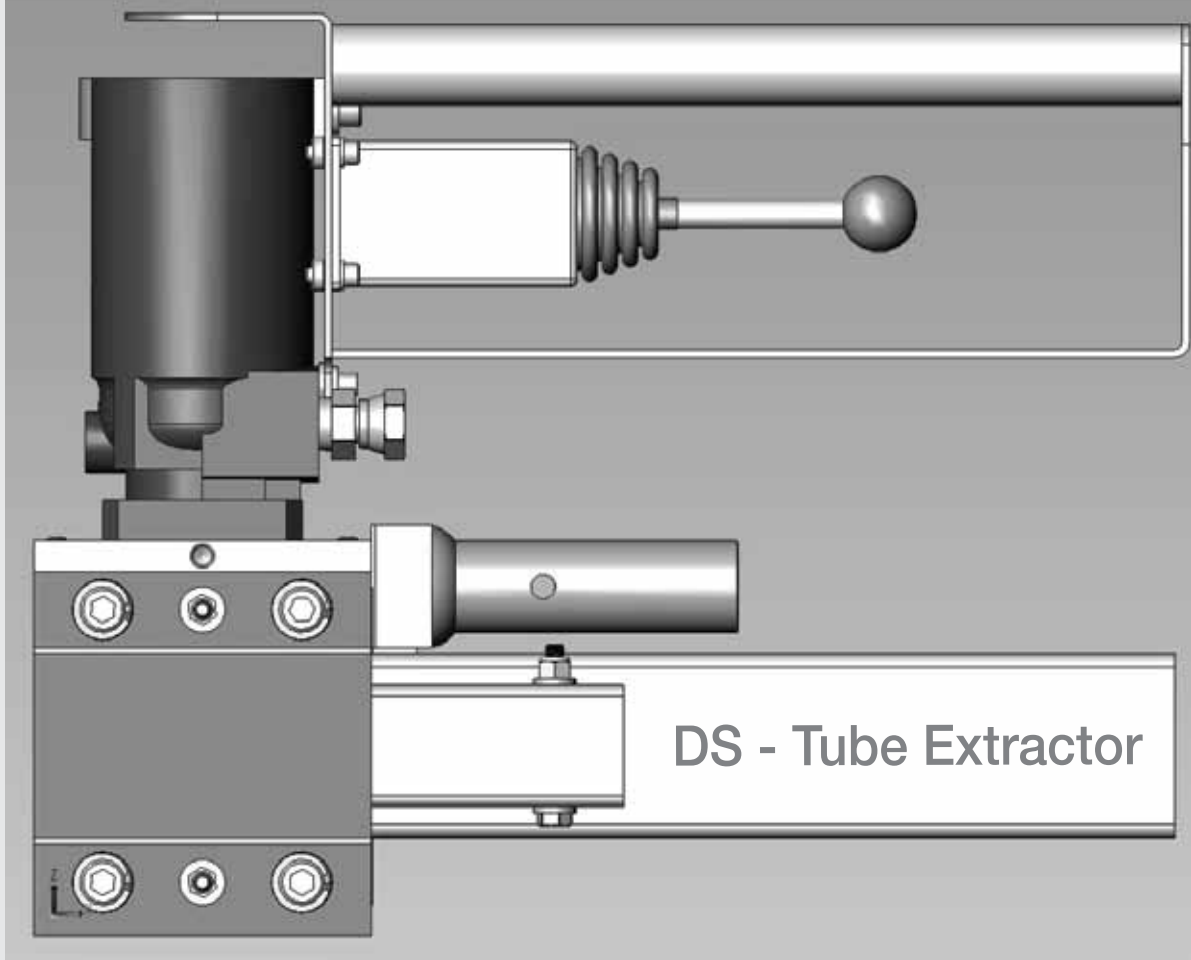


# Condenser Tube Removal Tools

*The latest in high speed tube extraction technology*

2011 edition



*Manufacturers & Suppliers of Quality Tube Removal Tools & Support Equipment*

phone 805-565- 9025

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# Tube Pulling System

## DEMO SERIES BENEFITS:

- ✓ Maximum Pulling Force & Production
- ✓ Low Consumable Cost & Wear Rates
- ✓ Improved Safety & Low Maintenance Design
- ✓ Dependable , Parts & Technical Support

## Internal Tube Cutters

The first step in extracting tubes is to cut the tube at one end of the condenser. PSR offers three models of pneumatic cutters with adapter parts to cut 3/4", 7/8" and 1" tubes from 16-22 BWG. Production rates vary with speed selection/setting, alloy and gauge. Maximum air requirement is 30 CFM at 80-100 PSI. Water based-soap and other lubricants are available to extend the life of the cobalt alloy bits.

- **1000 RPM Model:** Used for brass, copper alloy and other non-ferrous tubes  
Production: 12-20 cuts/minute
- **700- 400 RPM Model:** Used with adjustable speed muffler for non-ferrous and stainless steel tubes.  
Production: 5-12 cuts/minute
- **200 RPM Model:** Used for stainless steel and titanium tubes  
Production: 3- 8 cuts/minute



Cobalt Bit



700 RPM Model

## Collet Tube Pullers & Pump

The second step in extracting condenser tubes is to break them free of the tube roll. The puller pulls the tube out of the tube sheet approximately 6" so the tube can be pulled continuously using the PSR extractor. It also pulls stubs from the opposite tube sheet. Jaw sets and size adapter parts are available for 3/4", 7/8" and 1" tubes and from 16 to 22 BWG.

- **Standard Production Model:** PSR's hydraulic puller provides the best weight to pulling force ratio and production efficiency in the industry.  
Cylinder Type: Single acting/air-return (80-120 PSI /3CFM air)  
Stroke: 6"  
Cycle Rate: Up to 8 tubes per minute  
Pulling Force: 10 Tons  
Operating Pressures: 2000-10,000 PSI



6" Stroke Puller

## Collet Tube Pullers & Pump Continued...

- **Long-Pull Model:** PSR's 26" stroke puller is used along with stand-off pipes to extract tubes located close to the side of the water boxes and other tight areas. With the exception of longer pulling cycles and increased weight the pulling capacities, general design and capacities are the same as PSR 6" stroke puller.

- **Standard Hydraulic Pump:** PSR pullers are power by specifically configured Vanguard® hydraulic electric pumps. All pumps start at reduce voltage and are equipped with 20 feet of shielded whip hose and remote control cord.

Operating Pressures: Adjustable up to 10,000 PSI

Power Requirements: 110/115 V



Collet Jaw Set



10,000 PSI Pump

## Tube Extractor & Pumps

The third step is the complete removal of the tubes. The PSR extractor flattens the tube as it is pulled from the condenser. Using a bidirectional-variable speed control handle mounted on the unit the operator controls the direction of travel ( forward, neutral, reverse), speed, pressure and horsepower. The extractor rolls automatically adjust to accept tubes up to 1.5 " OD.

- **Tube Extractor:** To withstand the forces of pulling up to 8 tubes per minute (30 ft long) the machine's body is constructed of aircraft grade aluminum for strength and the wear parts of finest tool steels which are hardened to extend life. PSR's unique Chevron Extractor Rolls V-pattern design provides for a better surface contact "bite" and travel alignment "tracking" a requirement for preventing tube slippage.

Extraction Speed: 0 – 250 feet/minute

Pulling Force: 5000 lbs at 2000 PSI

Weight: 98lbs (A tool balancer is supplied)

- **Gin Pole:** This 10 foot long heavy walled steel pipe with sliding counter weight and lifting eye is used to extend and balance extractor when working within the water box.



Extractor



Extractor Rolls

## Tube Extractor & Pumps Continued...

- **Standard 60 HP Hydraulic Pump:** This closed loop hydraulic system is used to power the extractor and also provides a power outlet for the chopper plug. A 60 HP electric motor drives a variable displacement pump with electrical displacement controls which is connected to the control handle on the extractor. The system is built within a HD metal cart with 4 swivel casters and 4 lifting lugs.

Power Requirements: 480 V 3 - phase  
Maximum Oil Flow: 60 GPM  
Operating Pressures: 1800 – 2200 PSI  
Heat Exchanger Water Supply: 5 GPM  
Alarms: High temperature and Low Oil

- **Custom Hydraulic Pumps:** Include air over hydraulic designs and diesel/gas driven power units with pumps capacities ranging from 30 to 60 GPM.



60 HP/ 60GPM Pump

## Tube Chopper

The final step in the extraction process is to chop the flattened tubes into 3.5" pieces. This step simplifies the handling and increases value of the scrap tubes.

- **Tube Chopper:** This extra heavy duty 5 HP unit chops 1 diameter flattened brass and copper alloy tubes two at a time. Dual feed is not recommended for stainless steel tubes. When wired for 460V the chopper 50 power cord plugs into the extractor pump to receive power.

Electrical Options: 3-phase 230V and 460V  
Air Requirements: 3 CFM-60 PSI

- **Chopper Stand:** This metal stand accommodates an ISO 48" X 40" pallet with a 36 high box and is available with steel casters or base plates w/anchor bolt holes.
- **Self Dumping Hopper:** Use of self dumping hoppers allow for the efficient transfer of scrap from the chopper to bulk roll-off containers and trailers.



Tube Chopper

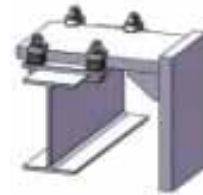


Chopped Tubes

## Universal Beam & Trolley

Rigging up a beam in trolley system to support and balance the extractor is essential to maximize the tube removal production rate. PSR's Universal B&T Systems® rapidly bolts-up to the water box flanges of various size and shape condensers, and works well in situations with tight overhead clearances.

- **Beam and Mounting Brackets:** Thick plate 30" X 12" L brackets mount to the condensers flange and are connected to a W8X13/lb. beam utilizing Lindapter® structural steel connectors and location plates in a hung "shown" or top position. This 1-ton rated design allows for adjustment of the beam along its vertical and horizontal axis. Beams are painted safety yellow, available in 10, 12, 15, 20 and 25 ft. lengths and include 2 bolt on trolley stops on both ends.
- **Standard Trolley:** The Harrington NTH series 1-ton combined push trolley/CF hand chain hoist is perfect for extractor balancing and gin pole rigging applications and where work quarters are usually tight and headroom is limited.
- **Pipe Trolley:** Pipe Trolleys with special mounting bracket can be used within in larger condenser water boxes to suspend the extractor using a balancer. Our pipe trolleys are fitted on either 2" schedule 40 or schedule 80 pipe for a longer span.



Beam-Hung



Beam & Trolley



Pipe & Trolley

## Spray & Vibratory Equipment

Whether retubing or salvaging a condenser it is standard practice to saturate the tube bank with water while using the collet and extractor to remove the tubes. The water acts as a lubricant and also controls dust. In condensers deactivated for an extended period, common to salvage projects, the tubes become tightly bonded to the steel support sheets due to oxidation. Depending on the level of oxidation and the residual gauge snapping may occur when subject to high pulling forces. To remedy this situation surfactants can be metered into the water spray system and vibrators used to penetrate and break the bond.

- **Water Spray Systems:** Two types of systems are available; perforated metal tubes with nose guides and/or special sprinklers generated a fine mist within or directly above the tube array. The complete package typically includes the spray devices, valves, hoses, booster pump and/or recalculating pump.
- **Support Sheet Vibrators:** Appropriately sized and placed pneumatic piston vibrators attached to the mount plates welded to the condenser's shell will transmit subtle vibrations through the shell to the support sheets. Each system is customized based on the unit's size, shape and construction and usually included; an installation diagram, piston vibrators, T-slot mounting plate for flat surfaces, channel mounting plates for round surfaces and air control package. Air requirements vary depending on the number and size of the vibrators deployed and typically range from 150 CFM to 600 CFM at 50 PSI.



Spray Jets



Air Vibrator