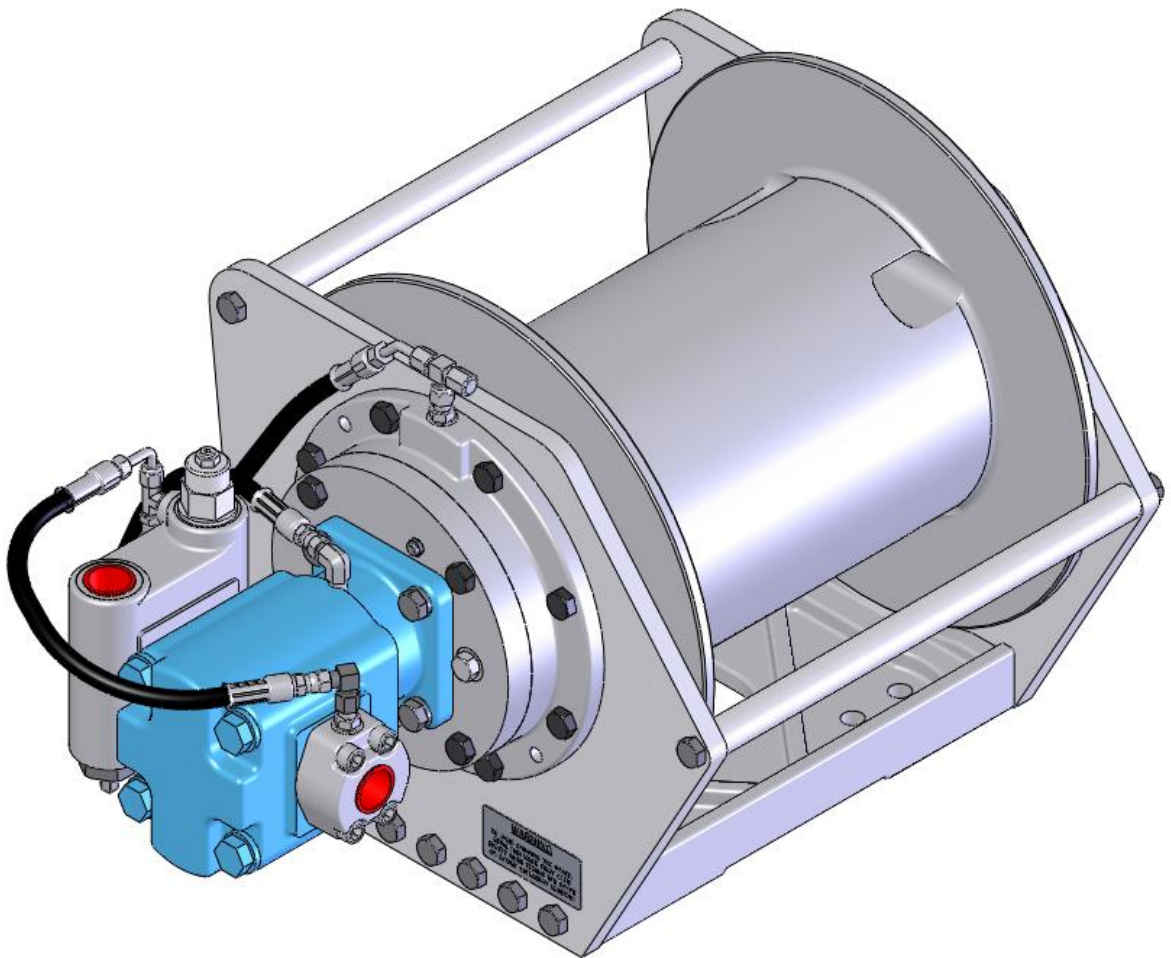




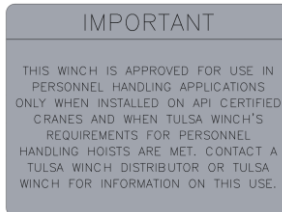
# API

# INSTRUCTIONS FOR PERSONNEL HANDLING HOISTS





All Tulsa Winch hoists that are approved for use on American Petroleum Institute (API) Specification 2C certified cranes used for personnel-handling, will be shipped with a tag permanently affixed in a conspicuous location, this tag will read:



**INSTRUCTIONS for personnel-handling hoists, models 800H, 1200W and 1500W, are as follows:**

**In any instance there is a question about the recommendation from Tulsa Winch, API Specification 2C and/or API Recommended Practice 2D or other pertinent standards will take precedence.**

**1.0 Hoist Capacity Design Factor**

The rated load when handling personnel required by API 2C section 4.1.2 shall be the least of:

- a. Thirty-three percent of the calculated safe working load (SWL) for non-personnel load ratings.
- b. Maximum load based on load line reeving and wire rope design factors per API 2C section 7.2.4.3.
- c. Maximum load based on load hoist line pull available considering line reeving losses with manufacturer's design reeving for a load at the boom tip, calculated in accordance with API 2C section 8.1.7.

The published "load chart" rated load shall be reduced from the above calculated rated loads by the weight of the hook and block excluding the load hoist rope, the personnel net shall be considered part of the load.



## **2.0 Maintenance and Service**

### **2.1 Maintenance Scheduling**

The owner is to ensure proper inspection intervals, in compliance with the API RP 2D Section 4 requirements, and will review hoist usage categories on a periodic basis. An API RP 2D Qualified Inspector or Qualified Operator should perform all maintenance and inspections.

- For hoists in **infrequent** use, less than 10 hours per month, API RP 2D recommends a pre-use inspection and an annual 12-month inspection based on average use over a quarter.
- For hoists in **moderate** use, more than 10 but less than 50 hours per month, API RP 2D recommends a pre-use inspection, quarterly inspection, and an annual 12-month inspection based on average use over a quarter.
- For hoists in **heavy** use, more than 50 hours per month, API RP 2D recommends a pre-use inspection, monthly inspection, quarterly inspection, and an annual 12-month inspection.



		Total monthly usage based on average usage over a 3 month period	Inspection Procedures				
			Level 1	Level 2	Level 3	Level 4	
			Pre-use inspection	Brake Test and Corrosion Inspection	Oil Observations	Teardown inspection if hoist subject to Level 3 inspection	Teardown inspection if hoist <b>NOT</b> subject to Level 3 inspection
Crane Usage Category	Infrequent	Less than 10 hours	Required prior to each shift of use and periodically during extended shifts	Quarterly (every 3 months)	Semi-Annual (every 6 months)	72 months	36 months
	Moderate	10-50 hours				48 months	24 months
	Heavy	50-200 hours				36 months	18 months
	Severe	Operated at loads over 75% of rated load for more than 75% of lifts and/or over 200 hours per month	Monthly	Quarterly (every 3 months)	24 months	12 months	
	If hoist has not been used for 3 months	0 hours	Required	Required	Not required	Not required	
	Authorized Inspection Personnel		Qualified Operator	Qualified Inspector	Qualified Inspector	Qualified Inspector	Qualified Inspector



## 2.2 Inspection Categories

### 2.2.1 Initial

Initial inspections apply to cranes that are new and are being placed into service, cranes that are being permanently relocated, and temporary cranes. A Qualified Inspector shall perform these inspections. Every initial inspection shall include a load test performed per the procedures outlined in API RP 2D Appendix E.

### 2.2.2 Pre-Use or Daily

The pre-use inspection shall be performed and documented prior to the first crane use of the day, prior to or during each change in crane operator, and then as the Qualified Crane Operator deems necessary during the day for extended operations. A Qualified Inspector may also perform these inspections.

Pre-use or daily inspection may include but not be limited to the following actions:

1. Check all fluid levels.
2. Visually check hydraulic hoses and fittings for wear and deterioration or corrosion and repair as necessary.
3. Visually check for hoist lubricant oil leakage. In hoists where a sight glass is provided, also check the fluid level.
4. Visually check wire rope for evident deterioration and damage, or improper reeving.
5. Visually check for loose, missing, or corroded bolts, pins, keepers or cotter pins.

Lubricate components and correct deficiencies as required based on the results of these inspections.

### 2.2.3 Monthly

The monthly inspection shall be performed once per month, for all cranes assigned a Heavy Usage category. A Qualified Crane Operator shall perform this inspection. A Qualified Inspector may also perform these inspections.

Monthly inspections may include but not be limited to the following actions:

1. Perform the pre-use or daily inspection
2. Check appropriate electrical apparatus for proper function.
3. Check boom hoist limit and anti-two block devices for proper operations. Care should be exercised to prevent damage to crane components.

Lubricate components and correct deficiencies as required based on the results of these inspections.



#### **2.2.4 Quarterly**

The quarterly inspection shall be performed once every 3 months for cranes assigned a Moderate or Heavy Usage category. A Qualified Inspector shall perform this inspection.

Quarterly inspections may include but not be limited to the following actions:

1. Perform the pre-use or daily and monthly inspections.
2. Sheaves should be inspected for wear, cracks, and rope path alignment and bearing condition.
3. Visually check crane hooks for deformation, and discard if deformations exceed those manufacturer's recommendations.
4. Inspect wire rope per API RP 2D 5.1.2.
5. Check lubricant level in the hoist, including hoists not fitted with sight glasses.
6. Take a sample of the lubricating oil per 2.4 Preventive Maintenance and Oil Sampling. Refill the hoist to the proper level with the recommended lubricant.

**NOTE: Oil analysis alone cannot detect nor warn against component fatigue failure.**

Lubricate components and correct deficiencies as required based on the results of these inspections. Document these results per API RP 2D 4.2.2. Oil sample analysis, per 2.4 Preventive Maintenance and Oil Sampling, is intended primarily to evaluate its mechanical integrity.

#### **2.2.5 Annual**

The annual inspection shall be performed once every 12 months. A Qualified Inspector shall perform this inspection, and it applies to all cranes, regardless of usage category.

Annual inspections may include but not be limited to the following actions:

1. Perform the pre-use or daily, monthly and quarterly inspections.
2. Change the lubricating oil in the hoist gear cavity after an oil sample has been taken per 2.4 Preventive Maintenance and Oil Sampling. Refill the hoist to the proper level with the recommended lubricant. Refill the hoist to the proper level with recommended lubricant.

Lubricate components and correct deficiencies as required based on the results of these inspections. Document these results per API RP 2D 4.2.2. Oil sample analysis, per 2.4 Preventive Maintenance and Oil Sampling, is intended primarily to evaluate its mechanical integrity.

Inspection of critical crane components: The Annual Inspection of critical crane components for an individual machine will differ, depending on the crane type and design of the individual components. A basic guideline for inspection of critical crane components should consider but not be limited to the following:



Hoist Assemblies – Annual Inspection and maintenance of the hoist should be determined by the Crane Owner as a function of the hoist type, past and anticipated duty cycle, and condition. The quality of the hoist lubricant is a primary indicator of the mechanical integrity of the hoist. Brakes should be tested by stalling the drive per 3.1 Brake Testing Procedure. See API RP 2D Appendix D, Spring-set Hoist Brakes, for additional recommendations for spring-set hoist brakes.

### **2.3 Tear down Inspections**

Tear down inspections of TULSA WINCH hoists should be completed per the usage schedule defined below. Magnetic Particle Inspection (MPI) of the internal ring gear and reduction gears must be performed during tear down inspections to aid in the detection of cracks in the ring gears due to fatigue. The preferred inspection method is the Fluorescent Wet Magnetic Particle Inspection using ultraviolet light consistent with ASTM E709.

Severe Usage - Perform tear down inspection / MPI at least every (2) years  
Heavy Usage - Perform tear down inspection / MPI at least every (3) years  
Moderate Usage - Perform tear down inspection / MPI at least every (4) years  
Infrequent Usage - Perform tear down inspection / MPI at least every (6) years

It is strongly recommended that any moderate or infrequent usage hoist that is also used for personnel lifting undergo tear down inspections on a maximum basis of once every (3) years.

Any hoist that has NOT been subject to regular oil sample analysis must undergo a tear down inspection on an annual (12 month) basis. Also, if a hoist has an unknown history of repair and/or maintenance, it is highly recommended that the hoist undergo a tear down inspection prior to being placed into service.

**NOTE: Oil analysis alone cannot detect nor warn against component fatigue failure.**

A tear down inspection includes the hoist being completely disassembled, cleaned, inspected and repaired as required. Replacement of all worn, cracked, corroded or distorted parts, such as pins, bearings, shafts, gears, brake rotors, brake plates, drum and base should occur as required. All seals and O-rings should be replaced at this time.

Any deficiencies, including but not limited to those above, shall be corrected immediately.

All of the following operations **MUST** be performed **BEFORE** the hoist is placed back into service.

1. The rebuilt hoist **MUST** be line pull tested to the rated load of the hoist (hoist rating will vary with motor, gear ratio and drum options) with a dynamometer or



equivalent load measuring device. This test load shall be the maximum rating of the hoist for the specific application (at the normal relief valve setting for the hoist) - NOT the reduced rating used for personnel lifts.

2. The hoist must be dynamically tested by rotating the drum several times, in both the hoisting and lowering directions, while under a load of at least 30% of the hoist lifting capacity. Check for smooth operation during this procedure.
3. The hoist internal friction brake shall be tested per the procedures in section 3.0 of this manual.
4. After inspection or rebuild and testing, a new certificate for personnel handling shall be issued by the inspector / service technician, effective on the date the hoist is placed back in service. A sample certificate is shown below, and shall include, at a minimum, all of the information depicted here.

<p>Name of Service Company Approved by TULSA WINCH for handling personnel if used and maintained in accordance with TULSA WINCH Recommendations For Personnel Handling Hoists</p> <p>Hoist Model No.: _____ Hoist Serial No.: _____ Date of Inspection: _____ Work Order/Job No: _____ Inspector's Name: _____</p> <p>For a copy of recommendations call or write: TULSA WINCH 11135 S. James Ave, Jenks, OK, 74037, USA (918) 298-8300</p>
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## Oil Level Maintenance

Tulsa Winch recommends that the oil level in the gearbox and brake housing be checked and adjusted as part of the pre-use inspection. If the oil level drops frequently or oil leakage is detected during an inspection, maintenance should be performed to correct any problems.

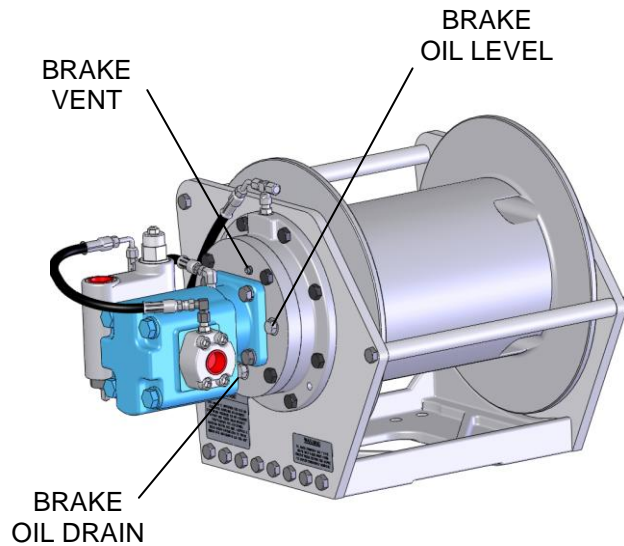


Fig. 2.1

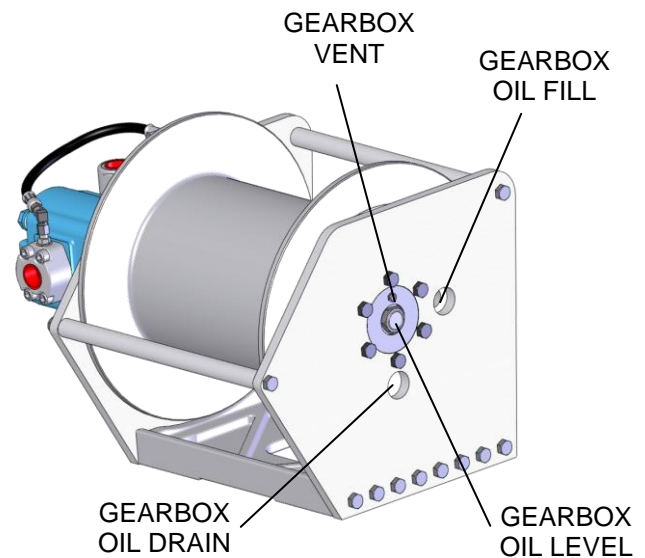


Fig. 2.2

- Gearbox oil level inspection is achieved by removing the oil level inspection plug and visually inspecting the oil level. Maximum oil level is to the bottom of the threads of the inspection hole. This procedure is explained, in detail, in your Tulsa Winch Service Manual. Use only the oil recommended in the Tulsa Winch Service Manual for your hoist type. See Fig. 2.2, Oil Level Inspection.
- Brake Housing oil level inspection is achieved by removing the oil level inspection plug and visually inspecting the oil level. Maximum oil level is to the bottom of the threads of the inspection hole. This procedure is explained in detail in your Tulsa Winch Service Manual. Use only the oil recommended in the Tulsa Winch Service Manual for your hoist type. See Fig. 2.1, Oil Level Inspection.



## **2.4 Parts Inspection and Replacement**

Any parts found to be worn-out, broken, or have excessive wear, shall be replaced with new parts manufactured and sold by Tulsa Winch or by a Tulsa Winch parts distributor. All oil seals should be replaced with new seals whenever maintenance or disassembly occurs. Care should be taken to inspect all gears, bearings, splines, and brake clutch assembly parts.

## **2.5 INSPECTION RECORDS AND RECORD RETENTION**

The owner as a function of conditions and usage should determine annual inspections and maintenance of the hoist. This inspection and/or maintenance report should meet the requirements set by API RP 2D. A copy of this report should be held at the authorized repair facility for not less than four (4) years.

**In any instance there is a question about the recommendation from Tulsa Winch, API Specification 2C and/or API Recommended Practice 2D or other pertinent standards will take precedence.**

## **3.0 Testing Brake Condition**

Tulsa Winch and API RP 2D, Appendix C, C.4.1.2d, recommends that all hoists used for personnel-handling, have their brake assemblies inspected and tested annually. A Qualified Inspector or Qualified Operator must perform the inspection/test and document the results for permanent record. The Qualified Inspector or Qualified Operator must test the condition of the braking system without having to lift a load, disassemble the hoist, or adjust the hydraulic pressure.



### 3.1 Brake Testing Procedure

This Brake Testing Procedure meets the requirement set by API Spec. 2C for hoists used for personnel-handling. This procedure should be completed in this order.

Fully close the needle valve firmly. See Figure 3.1, Needle Valve Location.

Remove the cap from the unused tee connection. See Figure 3.1, Needle Valve Location.

With the hydraulic power unit running, move the hoist control handle to the “**LOWER**” position.

Increase the hydraulic power unit running speed, if necessary, to bring the systems hydraulic pressure up to the relief valve setting.

This procedure will open the brake valve and leave the brake fully engaged. At this time there should be no brake slippage (drum rotation). If slippage occurs, check if needle valve is fully closed. If slippage continues, take the hoist off line and refer to Section 2.0 Maintenance and Service, of this document.

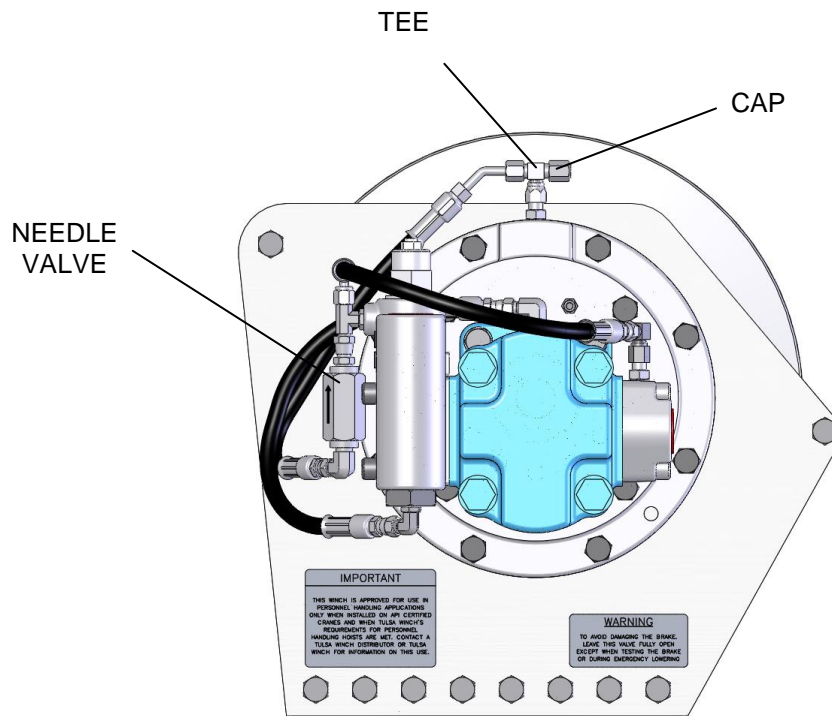


Fig. 3.1



### **3.2 Standpipe Installation**

Tulsa Winch does not install or supply the standpipe assembly mentioned in this document. Tulsa Winch highly recommends that a standpipe be installed on any hoist put in service in a personnel-handling capacity. The purpose of the standpipe is to supply hydraulic fluid to the hoist motor during emergency lowering of the personnel carrier.

For information on building a standpipe assembly, contact Tulsa Winch Engineering.

Install the standpipe, to the port, on the opposite side of the motor from the brake valve. The standpipe must be installed in a vertical (UP) position. (The standpipe will be required to meet API Spec. 2C for emergency lowering procedures), See section 4.0 Emergency Lowering of Personnel-Handling Hoists.

After the standpipe installation, fill the standpipe with hydraulic fluid before installing the hydraulic line.

### **4.0 Emergency Lowering of Personnel-Handling Hoists**

Disengaging of the brake for emergency lowering of personnel handling hoists. This procedure should be completed in this order. The most common reason for this emergency procedure is that the hoist unit has lost hydraulic pressure.

1. Fully close the needle valve firmly. See Figure 3.1, Needle Valve Location.
2. Remove the cap from the unused tee connection. See Figure 3.1, Needle Valve Location.
3. Remove both main hydraulic lines leading to and from the hoist motor assembly. (This procedure includes removing the hydraulic line attached to the standpipe).
4. Install a heavy-duty hydraulic hand pump to the uncapped connection on the tee.

#### **IMPORTANT**

Tulsa Winch does not supply the heavy-duty hydraulic hand pump mentioned in this procedure. Tulsa Winch highly recommends that a heavy-duty hydraulic hand pump be kept with any hoist put in service as a personnel-handling device.



5. Activate hydraulic hand pump until hoist drum starts to move slowly. (This procedure will release pressure on the brake clutch and cause the brake clutch plates to slip. (Heat will be generated by this slipping action).

**IMPORTANT**

If the hoist brake starts to chatter, activate the hand pump “SLOWLY” until the chattering stops.

6. Continue adding hydraulic oil to the standpipe while lowering the personnel carrier.

**- WARNING -**

**Hydraulic fluid level in the standpipe MUST BE MAINTAINED.**  
**Lack of fluid in standpipe could cause personnel carrier to free fall causing injury or death to personnel on carrier**

**- CAUTION -**

**Do not touch the motor or standpipe while lowering a load. They may become hot enough to cause burns.**

**IMPORTANT**

After an emergency lowering of a personnel-handling hoist, Tulsa Winch recommends that the hoist is taken off line and a brake inspection is performed. See Section 2.0, Maintenance and Service.



## 5.0 Hydraulic Control Schematic

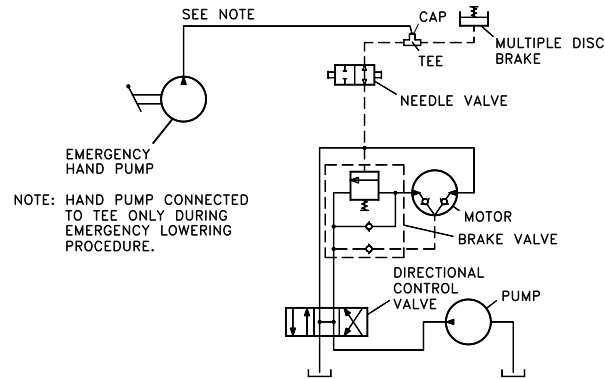


Fig. 5.1

## 6.0 Reference Material

- API Specification 2C
- API Recommended Practice 2D
- Tulsa Winch Service Manual, Model 1200W Winch
- Tulsa Winch Service Manual, Model 1500W Winch

For copies of these specifications and service manuals contact:

**American Petroleum Institute**  
 1220 L Street, Northwest  
 Washington, D.C. 20005-4070  
 Voice: 202-682-8000

**Tulsa Winch**  
 PO. Box 1130  
 Jenks, Oklahoma 74037-1130  
 Voice: 918-298-8300  
 Fax: 918-298-8301

It is recommended that this document and all other important documents be kept in a safe location for future reference.