

**CRAIG**  
QUALITY WE STAND BEHIND  
Attachments • Built Right • Fit Right

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# Owner's Manual

INSTALLATION • OPERATION • MAINTENANCE

## Deere G Series Motor Graders

301-12RM – Hydraulic Wing Assembly

302-12RM – Hydraulic Wing Assembly





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## Summary of Important Symbols

**T13000000**

Indicates the Craig serial number of the entire equipment assembly, ensure all components are stickered with matching serial numbers before completing the installation. Failure to do this may result in damage to the equipment or the machine.



Read instructions in owner's manual carefully before performing indicated function



Pay close attention to indicated warning, failure to do so may result in injury, death, or damage to equipment



Do not use attachment in indicated function; doing so may result in damage to equipment



Indicates proper operation techniques for attachment



Indicates vital grease areas that need attention beyond what a normal maintenance schedule gives.

**⚠ ATTENTION**

Indicates that danger may be evident to machine and or operator. Before any further steps are taken, the owner's manual should be thoroughly read and special precautions taken.

If at any point in the life of your attachments the safety decals become damaged or age to the point that they become illegible, Craig Manufacturing has replacement decals available. To obtain Safety decals, please contact the parts department.

## **Introduction**

The following pages and illustrations are printed to help you with the knowledge to better operate and service your new CRAIG equipment. We are proud to have you as a customer and feel you will be proud to be a CRAIG equipment owner.

Any piece of equipment requires, and must have a certain amount of service and maintenance to keep it in top condition. We have attempted to cover all the different areas of operation and maintenance; however, there may be times when special care must be taken to fit a specific condition. If you encounter something that is not covered in this manual, or encounter difficulties with the installation, give us a call at 1-800-565-5007. Our technical support team would be happy to help you through the problem.

Study your manual carefully and become acquainted with all the adjustments and operating procedures before attempting to operate your new equipment. Remember, it is a machine and it has been designed and tested to do an efficient job in all types of operating conditions and will perform in relation to the services it receives. If special attention is required for some conditions, ask your CRAIG dealer or call CRAIG MANUFACTURING LTD at 1-800-565-5007. We will be glad to help and answer any questions on operation and service of your new equipment.

### **Craig Manufacturing Ltd. Hartland, NB - Head Office**

96 McLean Avenue  
Hartland, New Brunswick  
E7P 2K5

Toll Free Phone: 1-800-565-5007

Toll Free Fax: 1-800-267-5578

Office: (506) 375-4493

Fax: (506) 375-4848

[sales@craigattachments.com](mailto:sales@craigattachments.com)

### **Craig Manufacturing Ltd. Blackfalds, AB - Regional Office**

27323-88 Township Road 394  
Blackfalds, Alberta  
T0M 0J0

Toll Free Phone: 1-800-565-5007

Toll Free Fax: 1-800-267-5578

Office: (403) 356-0048

Fax: (403) 356-0049

[sales@craigattachments.com](mailto:sales@craigattachments.com)

### **Craig Manufacturing Ltd. Cambridge, ON - Regional Office**

315 Thompson Drive  
Cambridge, Ontario  
N1T 2B3

Toll Free Phone: 1-800-565-5007

Toll Free Fax: 1-800-267-5578

Office: (519) 623-9500

Fax: (519) 623-9511

[sales@craigattachments.com](mailto:sales@craigattachments.com)

[www.craigattachments.com](http://www.craigattachments.com)

Check out Craig Tech Tips on YouTube.

[www.youtube.com/craigmanufacturing](http://www.youtube.com/craigmanufacturing)

## **Safety**

### **Safety Precautions**

Improper installation and/or operation of your Craig Manufacturing Ltd. Attachments can cause bodily injury, property damage, and damage to your equipment. Read and understand labels and this booklet before operating or making adjustments. Failure to do so may affect your warranty.

### **Warning Labels**

Become familiar with and inform users about all warning and instruction labels on the back of your attachment.

#### **NOTE:**

- If labels are missing or cannot be read, call 1-800-565-5007 we can provide a replacement.
- When ordering replacement parts, use only genuine Craig replacement parts. Who knows better what you need that the original equipment manufacturer.
- Please have the serial number of your attachment ready when you call.

### **Hydraulic Safety**

Always inspect hydraulic components before operating your equipment. Replace any damaged or worn parts immediately. Lower blade when machine is not in use. Temperature changes can change hydraulic pressure, allowing the blade to drop unexpectedly causing injury or damaging hydraulic components. Hydraulic fluid under pressure can cause bodily harm. If you suspect a hydraulic leak use a piece of wood or cardboard to investigate, DO NOT use your hand. If you are injured by hydraulic fluid, seek medical attention immediately.

## ***Recommended Flow Rates***

To operate the standard 301 wing assembly the grader will require 3 free spools. Another free spool is required for extra accessories. For warranty purposes one section must have float, and a second section must have a work port relief.

### ***301-302 Wing Assembly Recommended Hydraulic Cylinder Flow Rates***

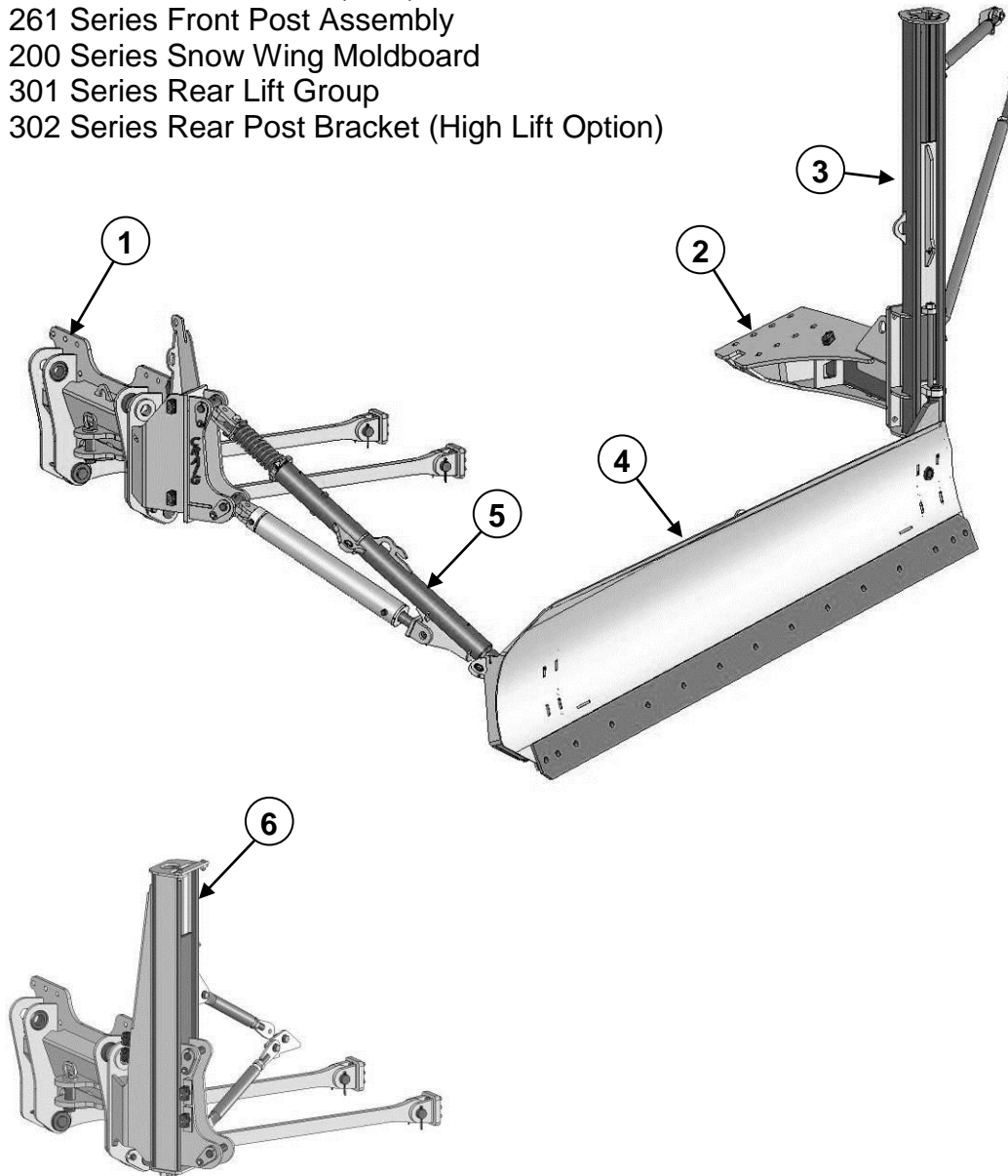
- |                             |  |
|-----------------------------|--|
| <b>Rear Extend</b>          | - Work Port relief at 1100psi/Anti-Cavitation recommended.<br>- 8-15 GPM (30-57 L/MIN) |
| <b>Rear Lift</b>            | - Float Required<br>- 20 GPM (76 L/MIN)  |
| <b>Rear Post (302 only)</b> | - Minimum of 5 GPM (19 L/MIN)  |
| <b>Front Post</b>           | - Minimum of 5 GPM (19 L/MIN)  |

## Know Your Equipment

### 301 & 302 Series Wing Assembly for Motor Graders

When ordering parts for your Craig snow gear, use only genuine Craig Replacement parts

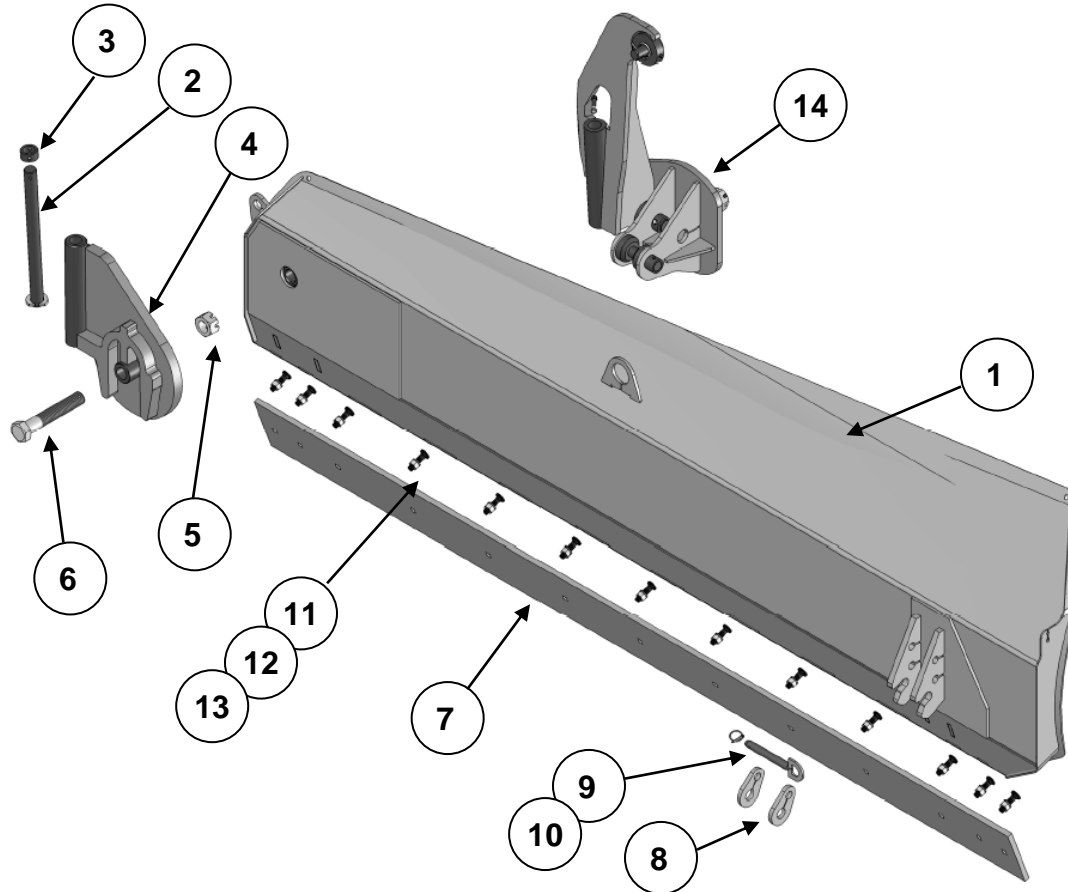
1. 301 Rear Post Bracket (RPB)
2. 301 Front Post Bracket (FPB)
3. 261 Series Front Post Assembly
4. 200 Series Snow Wing Moldboard
5. 301 Series Rear Lift Group
6. 302 Series Rear Post Bracket (High Lift Option)



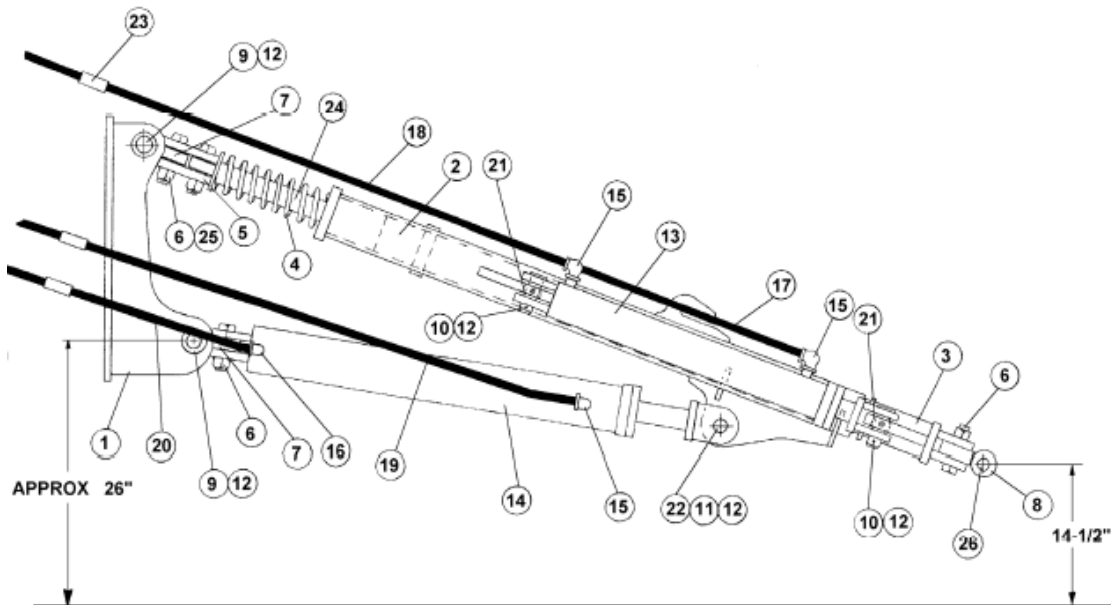
Brackets shown may not be exactly as delivered.

## Assembly Component Breakdowns

### Parts List – 201 Series Standard Wing Moldboard



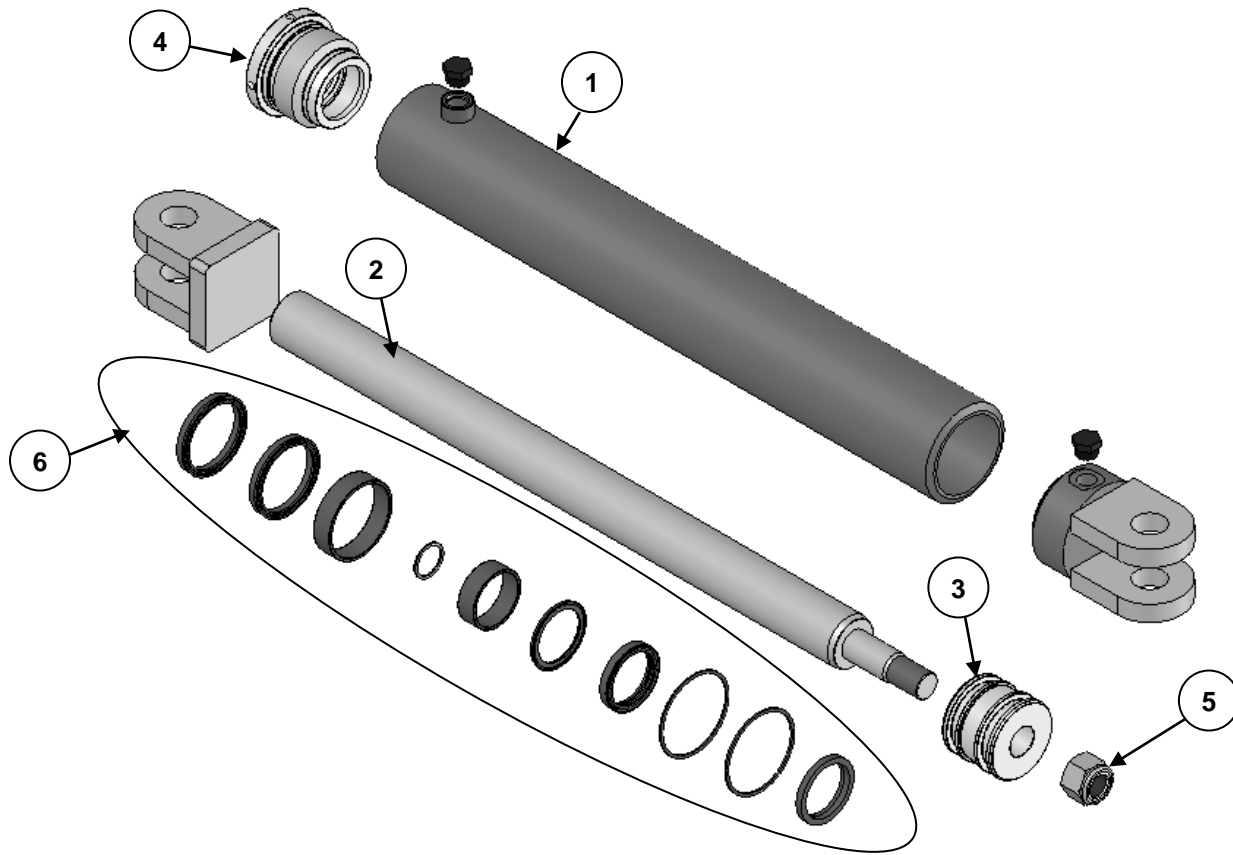
NO	DESCRIPTION	QTY	10 foot	11 foot	12 foot
1	Moldboard	1	Custom Layout – Please call for details		
2	Slide Pin	1	09620-00	09620-00	09620-00
3	Slide Pin Collar	1	09621-00	09621-00	09621-00
4	Bell Swivel	1	10050-02	10050-02	10050-02
5	Castle Nut	1	00705-00	00705-00	00705-00
6	Shear Bolt	1	00702-00	00702-00	00702-00
7	Cutting Edge	1+	Custom Hole Spacing – Please call for details		
8	Teardrop Lug	2	08976-00	08976-00	08976-00
9	Wing Bracket Pin	1	08977-00	08977-00	08977-00
10	Lynch Pin	1	05833-00	05833-00	05833-00
11	Cutting Edge Bolt	13+	12042-00	12042-00	12042-00
12	Cutting Edge Lock Washer	13+	05529-00	05529-00	05529-00
13	Cutting Edge Nut	13+	11478-00	11478-00	11478-00
14	Hydraulic Trip Swivel (Optional)	1	131839-00	131839-00	131839-00
	- Shear Bolt for Hyd Trip	1	116473-00	116473-00	116473-00



### Parts List – 06450-12 → 301 Lift Group (Push Pole Assembly)

NO	DESCRIPTION	QTY	PART NO	NO	DESCRIPTION	QTY	PART NO
1	Universal Bracket	1	06739-04	14	Lift Cylinder	1	See Below
2	Outer Tube	1	06600-06	15	90° Elbow	3	Varies
3	Inner Tube	1	06601-04	16	45° Elbow	1	Varies
4	Spring	1	08018-00	17	3/8" Hyd. Hose	1	Varies
5	Yoke	1	09105-00	18	3/8" Hyd. Hose	1	Varies
6	Bolt	4	122309-00	19	3/8" Hyd. Hose	1	Varies
7	Swivel	2	06460-04	20	3/8" Hyd. Hose	1	Varies
8	Swivel	1	07356-00	21	Self-Aligning Bushing	2	06849-00
9	Pin Weldment	1	06740-04	22	Self-Aligning Bushing	1	07932-00
10	Pin Weldment	2	07349-04	23	Hose Connection Adapters	4	Varies
11	Pin Weldment	1	07348-04	24	Plunger Weldment	1	17709-00
12	Cotter Pin	3	11534-00	25	Locknut	1	11510-00
13	Slide Cylinder	1	See Below	26	Pin Weldment	1	00760-00

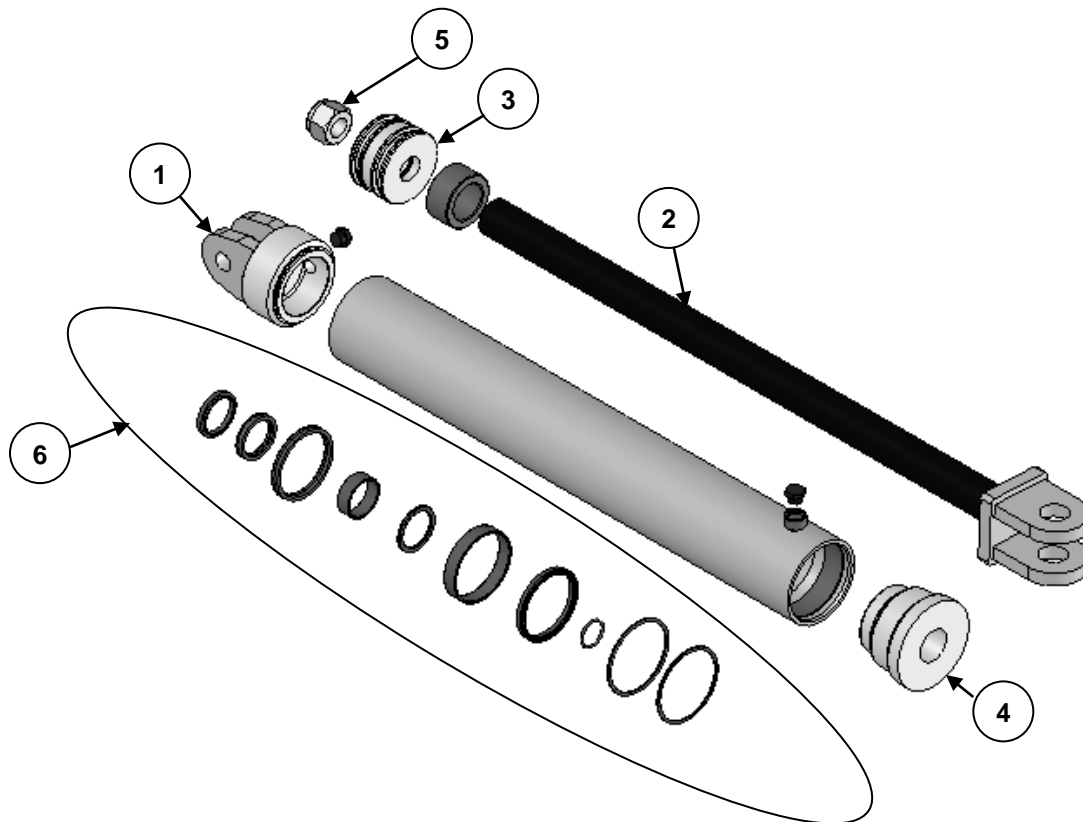
## Parts List – 40463-21.5 → Push Pole Slide Cylinder



Cylinder Rated for 4000psi

NO	DESCRIPTION	QTY	PART NO
1	Barrel Weldment	1	40464-26.25
2	Shaft Weldment	1	106668-30.375
3	Piston	1	38764-00
4	Packing Gland	1	40416-00
5	Cylinder Nut	1	38659-00
6	Kit Seal (Complete)	1	39222-00

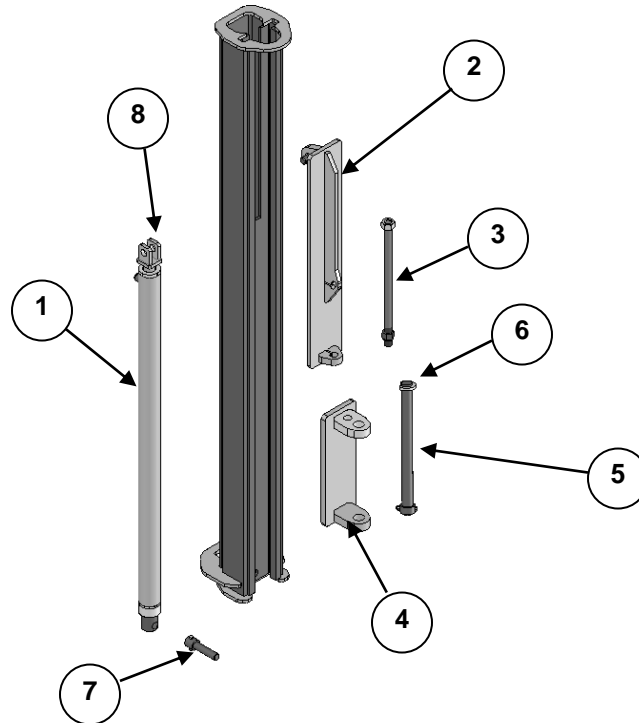
## Parts List – 40405-26.6 → Push Pole Lift Cylinder



Cylinder Rated for 4000psi

NO	DESCRIPTION	QTY	PART NO
1	Barrel Weldment	1	40418-32.500
2	Shaft Weldment	1	40419-36.187
3	Piston	1	38677-00
4	Packing Gland	1	40416-00
5	Cylinder Nut	1	38700-00
6	Kit Seal (Complete)	1	38706-00



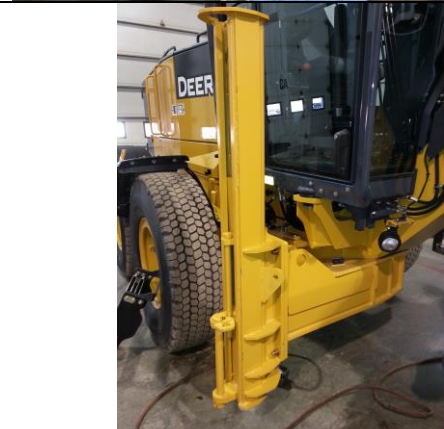
## Parts List – 16013-00 → 261 Series Hydraulic Front Post

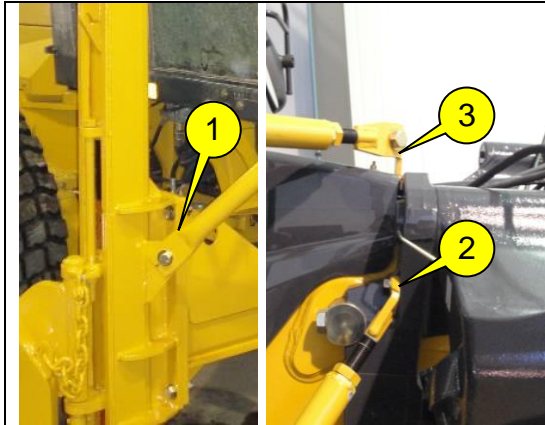


Cylinder Rated for 4000psi

NO	DESCRIPTION	QTY	PART NO
1	Cylinder	1	39240-48.0
2	Upper Slide	1	16019-01-B
3	Lift Bolt	1	09850-01-B
4	Lower Slide	1	17508-01
5	Bell Swivel Pin	1	09620-00-B
6	Collar	1	09621-00-A
7	Lower Cylinder Pin	1	16022-00-A
8	Upper Cylinder Pin	1	09622-00-A

## Installation

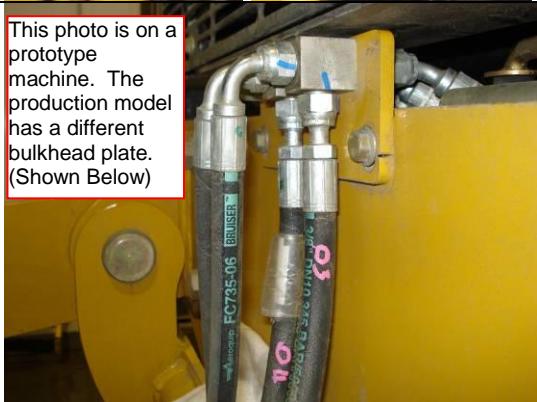
	<p><b>Wing Assembly Hardware</b></p> <ol style="list-style-type: none"><li>1. Begin by ensuring grader frame is level.</li><li>2. Remove the ladder from the operator's right hand side of the machine.</li></ol> <p>Note: Ensure the right side cab door is closed before proceeding with installation.</p> <p>It is recommended to run a tap through the threaded holes under the grader prior fitting the front mount.</p>
	<p><b>Front Post Bracket Installation</b></p> <p>Install Front post bracket to factory holes in bottom of gooseneck using supplied hardware.</p> <p>Ensure that the bracket is square both vertically and horizontally to the grader.</p>
	<p>Install front post to bracket as shown in photo.</p> <p>Ensure that the front post is square both vertically and horizontally to the grader.</p>



### Front Post Brace Installation

1. Install brace to front post as shown in photo.
2. Install brace lug to top of grader saddle shown in photo.
3. A 48" post will have a top brace that bolts to the top of the saddle.

This photo is on a prototype machine. The production model has a different bulkhead plate. (Shown Below)



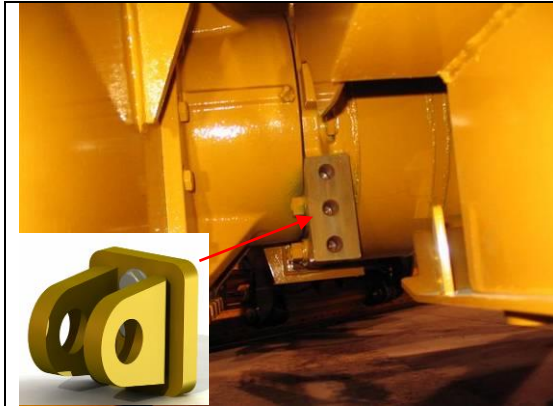
### Rear Post Bracket Installation

1. Mark ripper hoses prior to disconnecting to ensure they are reinstalled in the proper locations.
2. Remove all components of the factory ripper... Ripper, mounting brackets, Ripper braces and Hoses.
3. Replace rear bulkhead plate, shown in photo, with Craig supplied bulkhead plate shown in bottom photo.



4. Install rear post bracket using supplied hardware
5. Install Craig supplied ripper braces under machine.
6. Reinstall ripper hoses (if equipped) using OEM Hardware.

NOTE: Bosses in one end of Craig ripper braces have an offset hole to ensure a tight fit.

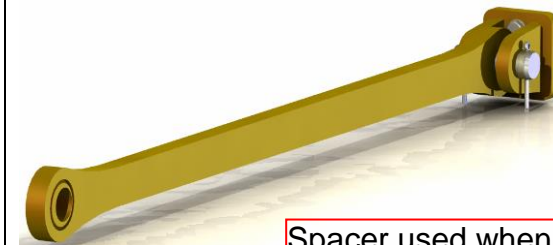


## Craig Ripper Braces

1. If machine is not equipped with a ripper, you must install ripper mounting pads on back side of rear axle using supplied M20 x 60mm bolts, location shown in photo.



2. Install ripper brace into previously installed mounting lug using pin supplied.
3. Place boss with offset hole in loose end of ripper brace.
4. Lift brace into place and line up holes in boss and Craig rear post bracket.
5. Slide pin through holes to keep brace in position.
6. Tack boss in position. Once tacked remove brace and weld boss in fully.



### NOTE:

The weld must be sanded smooth in order for everything to fit properly.



7. Paint as required and reinstall brace.



## Lift Group & Wing

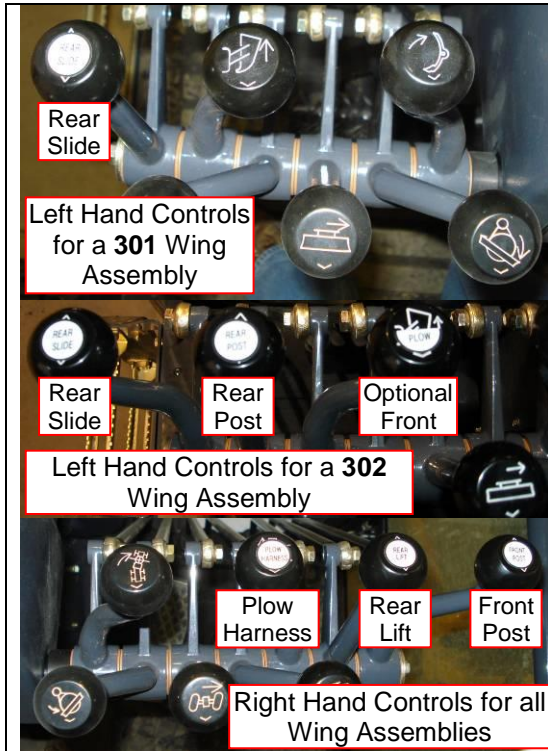
1. Lift Craig push pole into universal bracket as shown in the photo.
2. Slide in supplied pins and tighten bolts.
3. Lift front of wing with bell swivel and line up with slide on front post.
4. Install pin and retaining collar to



- lock front of wing into post.
5. Install safety chain as shown in photo.
  6. Align end of push pole with wing bracket and insert pin.

**NOTE:**

When wing is operational raise and extend fully to ensure the safety chain is not binding.



## Wing Hydraulics Installation

This section of the installation is not always straight forward, as the machines could have one of many hydraulics packages installed from the factory. The following instructions are what Craig has used. The orientation of the controls shown in this series of photos has been preferred by most operators in the industry, and is the Craig standard.

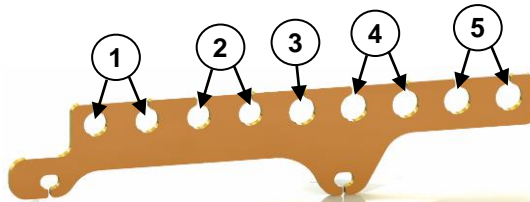


## Running Hydraulic Hoses

Wing Assembly shown in photo is a Craig 302 High Lift which requires three (3) functions at the rear of machine. Do not use OEM ripper hoses or Test port.

### New Bulkhead Layout

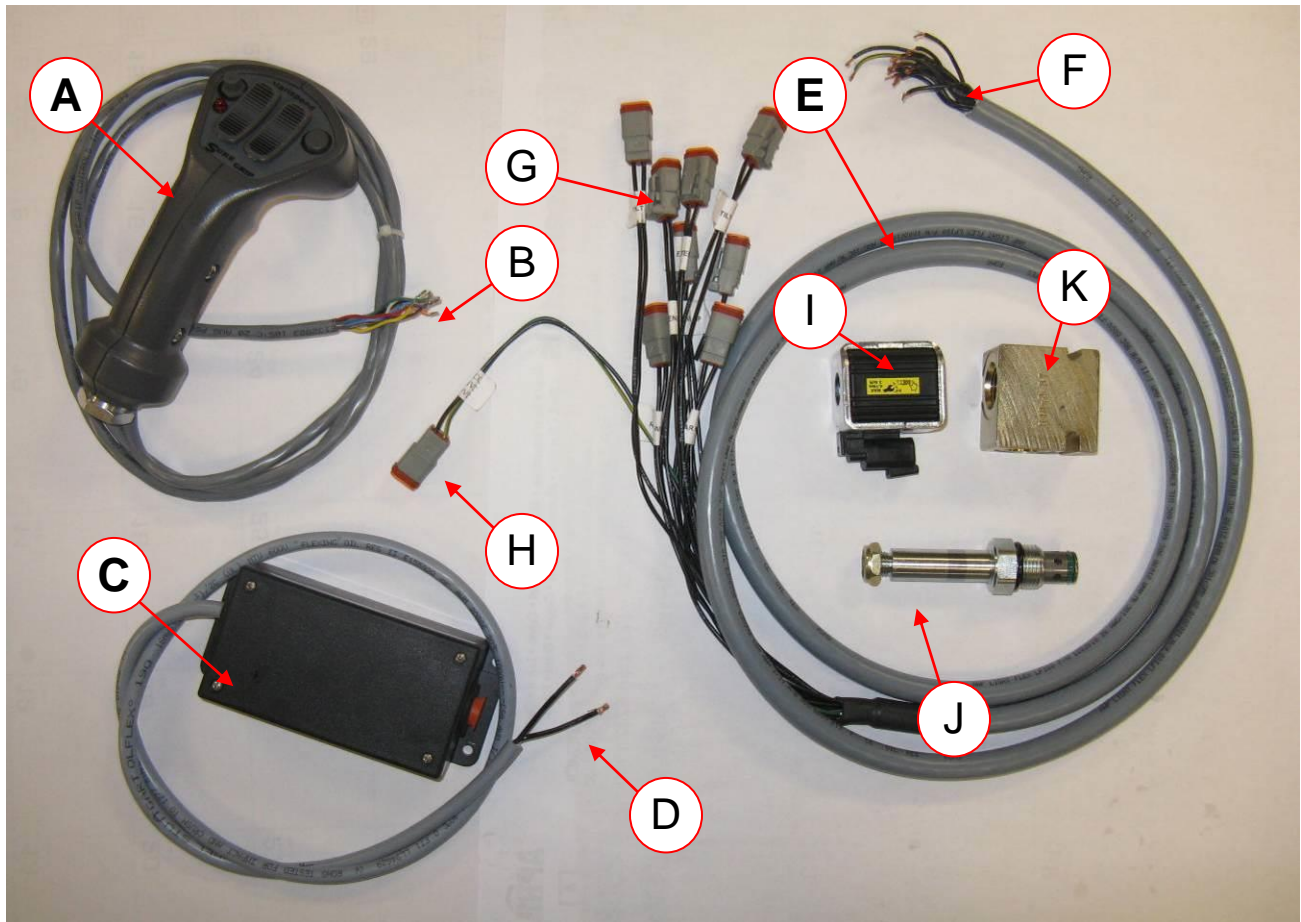
1. Rear Lift Hoses - Red
2. Rear Extend Hoses - Green
3. OEM Test Port
4. Rear Post Hoses – Grey (optional)
5. OEM Ripper Hoses





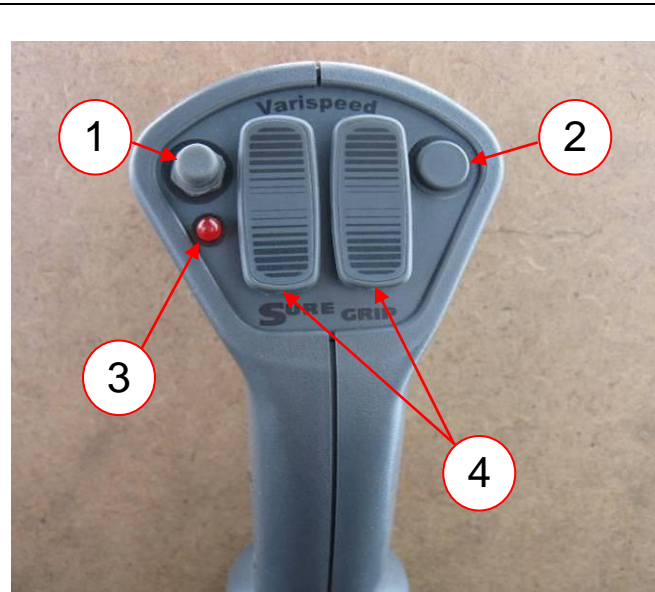
1. You will be required to run hose(s) from the grader valve to the rear bulkhead, either one (1) for a standard 301 Wing Assembly or two (2) for a 302 High Lift Wing Assembly.
2. Run rear lift hoses from valve to OEM bulkhead fittings at articulation point. (see photo) These hoses are already plumbed to the back in position #4.
3. Install rear implement hoses according to the order listed above.
4. Run hoses from rear bulkhead to implements.
5. Run hoses for front post from valve through clamp shown in photo to front post cylinder.

## Generic On/Off Joystick Kit



### Joystick Kit Components

- A - On / Off Joystick Wiring Harness
- B - Color Coded Wires to Connect Inside Control Box
- C - Joystick Control Box (2A fuse inside for float circuit)
- D - Numbered Wires for Power and Ground
- E - Valve Wiring Harness
- F - Numbered Wires to Connect Inside Control Box
- G - "DEUTSCH" Connectors to Connect to CRAIG Valve
- H - "DEUTSCH" for Float Solenoid
- I - Float Solenoid to Mount on CRAIG Valve
- J - Float Solenoid Insert
- K - Float Valve Body



## On / Off Joystick Controls

1. Turns float valve on and off
2. "Emergency Up" button (front and rear of wing raise simultaneously)
3. Red light indicates that float is active
4. Toggle switches operate the wing functions

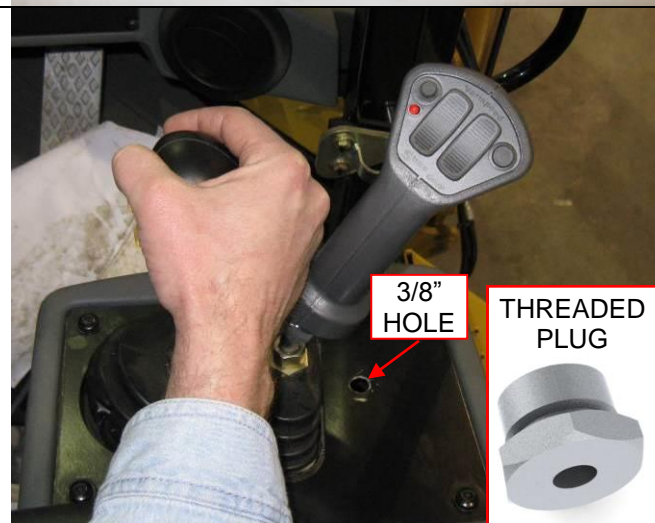
### Note:

- The trigger on the underside of the joystick, when held, allow the toggle switches to operate two (2) different functions, i.e. Wing extension, HTS, Reversible plow, Snow gate...



## Joystick Wiring Harness

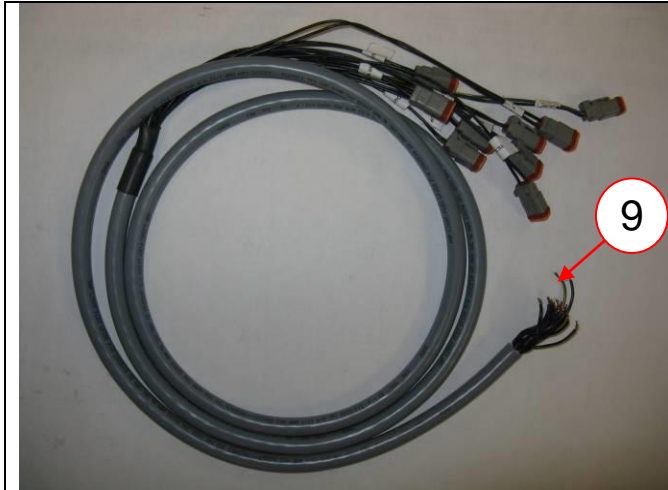
The joystick leads are shipped loose to allow the cable to be routed through the console in the cab using a small hole ( $\varnothing 3/8"$ )



5. Install CRAIG joystick. Generally the joystick can be installed on top of the factory 3<sup>rd</sup> spool lever.
6. Remove the plug from the bottom of the joystick. Drill and tap it to match the post in the existing lever.
7. The existing post may need modified to allow the use of both levers without contacting the opposite lever.
8. Drill a 3/8" hole next to this location for joystick leads.

Be careful not to drill through anything that may be under the console.

Be sure that there is enough cable to allow the lever to move through the full range of motion.

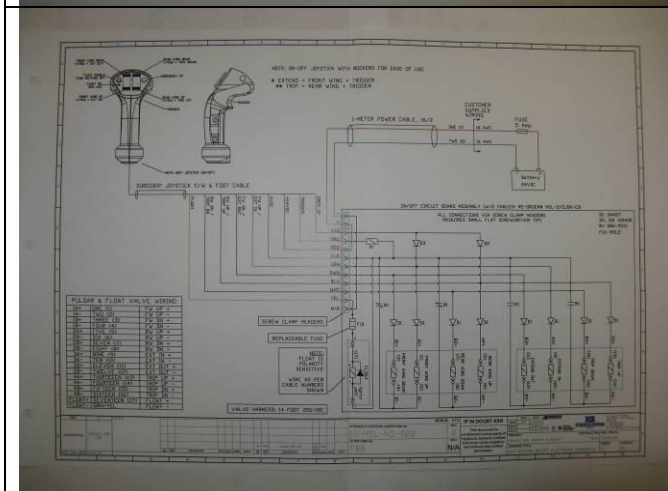


## 9. Valve wiring harness

Valve harness leads are also loose to allow the cable to be routed into the console through a single small hole drilled in the cab floor.(Ø13/16")

**Note:**

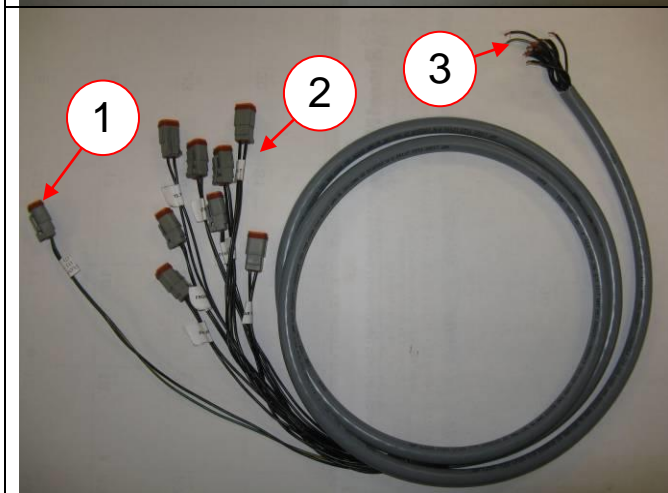
All wires have a specific location that they must be connected. If any wire is not connected on the proper location the joystick may not function properly.



There is a full wiring schematic is located at the back of this manual

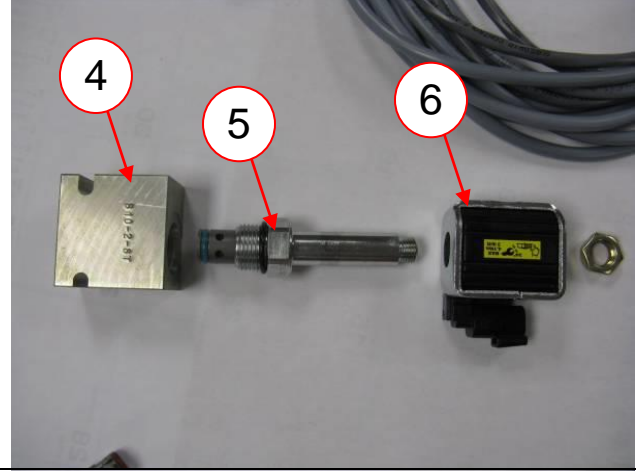
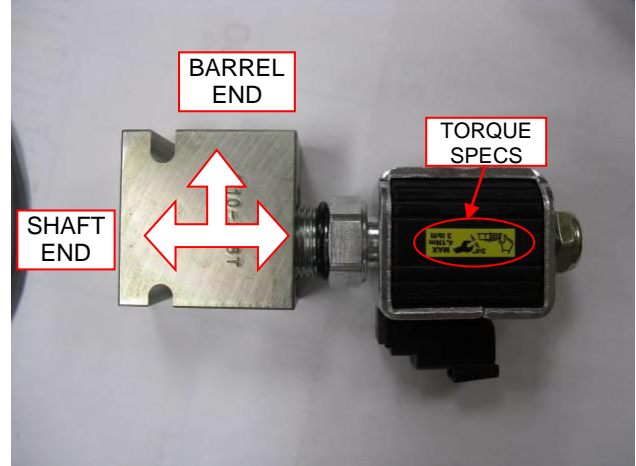

Use the supplied wiring schematic to match all numbered and colored wires with the proper location in the control box.

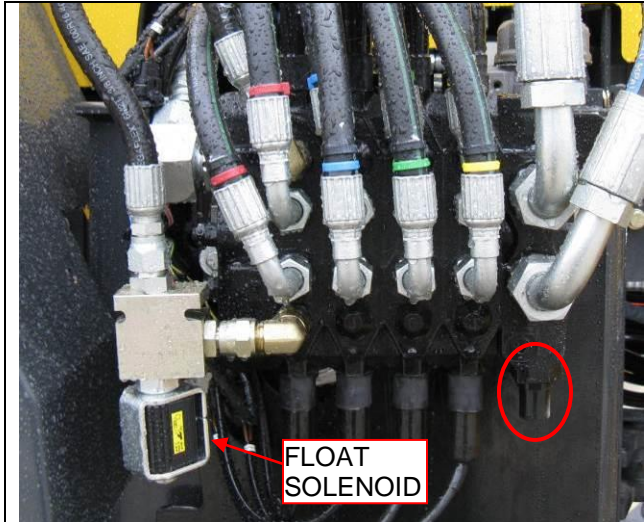
If you have any problems with this call our technical support team at 1-800-565-5007



## Valve Wiring Harness

1. This connector is for the float circuit and is connected to the float solenoid on the CRAIG valve
2. These ends with connectors are labeled as to which function they control and are connected to the corresponding function on the CRAIG valve
3. All loose wires on this end go inside control box.

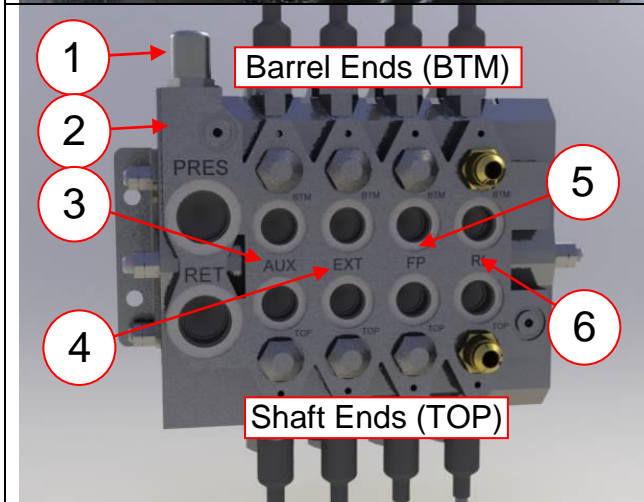
 A photograph showing three components of the float solenoid assembly. Component 4 is a brass solenoid valve block. Component 5 is a solenoid switch cartridge with a long shaft. Component 6 is an electro magnet with a yellow label and a black connector. A grey cable is visible in the background.	<ol style="list-style-type: none"><li>4. Solenoid Valve Block – Connects to the “REAR LIFT” section of the CRAIG valve</li><li>5. Solenoid switch cartridge – controls the oil flow for the float circuit</li><li>6. Electro Magnet – controlled by the “FLOAT” button on the CRAIG joystick.</li></ol>
 A photograph of the assembled float solenoid assembly. Red arrows and boxes indicate orientation: 'SHAFT END' points to the left, 'BARREL END' points to the top, and 'TORQUE SPECS' points to a yellow label on the electro magnet. The label contains the text '4000 C 4000 P 4000 X' and a warning icon.	<p>Assemble the float solenoid assembly as shown in photo</p> <p><b>Note:</b></p> <ul style="list-style-type: none"><li>• The orientation of the block is critical for proper orientation</li><li>• The torque specifications for the nut are written on The electro magnet (<b>Do Not Over Tighten</b>)</li></ul>
 A close-up photograph showing the electro magnet's black connector being plugged into a grey connector on a cable. A red arrow points to the connection point.	<p>Designated connector on valve harness connects to the float solenoid as shown in photo following installation on CRAIG valve</p>



**IMPORTANT**

- Regardless of the orientation of the CRAIG valve, the float solenoid **MUST** be installed in the proper orientation.
- The valve shown here is oriented upside down due to the path chosen for routing the hoses.
- Circled in the photo is an aluminum cap (pilot control cartridge, see #1 below).

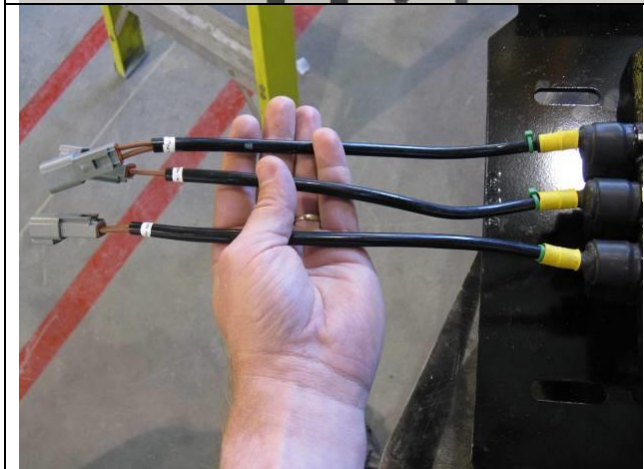
**THE FLOAT SOLENOID MUST BE INSTALLED ON THE SAME SIDE AS THIS CAP IN ORDER FOR CONTROLS TO OPERATE PROPERLY.**



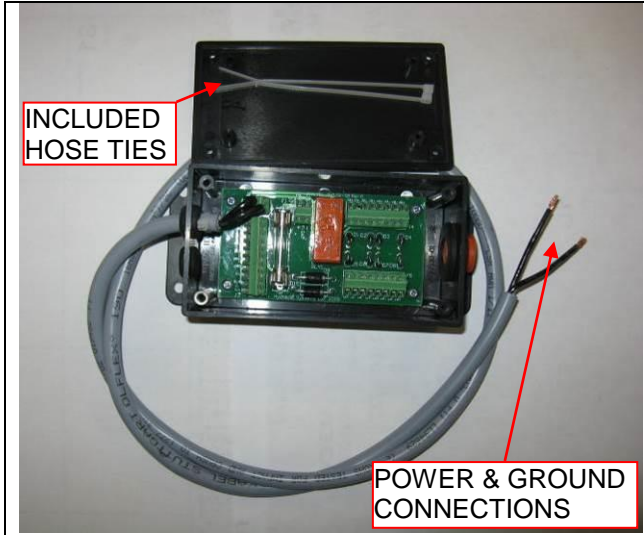
**CRAIG Valve**

1. Pilot control cartridge (Aluminum Cap)
2. Inlet valve section
3. Aux valve section (HTS, Reversible Plow, Snow Gate, etc...)
4. Push pole extension section
5. Front post section
6. Push pole rear lift section

**Note:** Item #1 will always locate the ports that are to be connected to the BTM (barrel end) of the cylinder.



“DEUTSCH” Female Valve Connector Will Come Pre-Assembled With The Valve



## Joystick Control Box

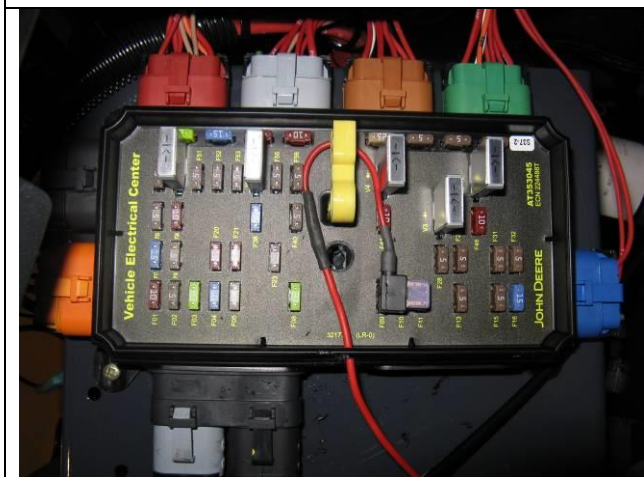
- Prior to beginning connections in the control box, find a location inside the cab (usually in the fuse box area) where the box will be protected from the weather.
- All loose wires are to be connected inside of this box. They are either numbered or color coded for ease of locating on the wiring schematic supplied at the rear of this manual.
- The fuse located inside the control box is intended to protect the float solenoid circuit only.



## Power Connection

The power connection must be connected to fused 24V keyed power. This fused connection will protect the joystick control box from any electrical surges.

1. The easiest location to get keyed 24V power to the control box is in the machines fuse panel. There will be an "Add a circuit" included in the HYDK supplied, this will take one (1) existing fuse and convert it to two (2) fuses each on its own circuit. So if one blows (if installed correctly) the other still has power.



2. Locate an existing fuse (keyed power) less than 10A. Install the "Add a Circuit" according to the instructions printed on the package and both the existing and the new fuse will work independently.

### Note:

- Slight modifications to the fuse panel cover (if equipped) may be required in some cases to allow the cover to close tightly.



3. Locate a suitable ground connection to ground the control box.

Generally there will be a suitable ground post in the same location as the fuse box of the machine.



### Finish Installation

- After all connections have been made and are secure inside the control box, use the included hose ties and clamp ends of cables inside the box tightly. This will help to keep the wires securely in the box and prevent them from accidentally being pulled out.

**Note:**

Do not complete these final steps until the entire installation is complete (including the hydraulics) and tested to ensure proper operation.



Replace the cover on the control box and install the supplied decal on top of the box. The joystick installation is complete. If you encounter any problems or have a suggestion about something that may not have been clear in this manual please feel free to call us toll free at 1-800-565-5007, or send us an e-mail at [techsupport@craigattachments.com](mailto:techsupport@craigattachments.com)

The final test procedure involves:

- Stroking all functions of the wing assembly to ensure all cylinders are full of oil, and are operating to the full range of motion. **Note:** All strokes of the cylinders are stamped on the barrel of the cylinder.

## ***Set-Up and Operating Instructions***

The following sections contain set-up procedures that need to be completed prior to operating your new CRAIG attachment. They also contain information to help you understand how to better operate and service your new CRAIG equipment in the future. If you are having issues in relation to any CRAIG product, please contact our technical support team at 1-800-565-5007. We stand behind our product 100% and are here to satisfy you, the customer. We are proud to have you as a customer and feel you will be proud to be a CRAIG equipment owner.

Any piece of equipment requires a certain amount of service and maintenance to keep it in top operating condition. It cannot tell you what it needs, so we have attempted to cover all the different areas of operation and maintenance. There may still be times when special care must be taken to fit a unique situation. If you encounter something that is not covered in this manual, please contact us and give us your suggestion.

Study this manual carefully and become acquainted with all adjustments and procedures before attempting to operate your new equipment. Remember, it is a machine and it has been designed and tested to do an efficient job in most operating conditions. However, it will only perform as well as the services it receives. If special attention is required, or you have questions not covered in this manual, ask your CRAIG dealer or call CRAIG Technical support at 1-800-565-5007. We will be glad to help regarding any questions you may have on the operation and service of your new equipment.

## ***Before You Start Plowing***

Operational Check: To avoid possible damage to your plow and wing assembly see that all parts move freely before operating on the highway. It is very important to inspect wing each day before use. Properly maintained equipment ensures that it keeps working properly for a long time. Congratulations on the purchase of your new Craig Snow Wing.

## ***Hydraulic Safety***

Always inspect hydraulic components before operating your Snowplow. Replace any damaged or worn parts immediately. Lower blade when machine is not in use. Temperature changes can change hydraulic pressure, allowing the blade to drop unexpectedly causing injury or damaging hydraulic components. Hydraulic fluid under pressure can cause bodily harm. If you suspect a hydraulic leak use a piece of wood or cardboard to investigate, DO NOT use your hand. If you are injured by hydraulic fluid, seek medical attention immediately.

## Setting Wing Stop

This procedure should be performed with all snow gear installed on the machine. There is no front plow installed on this machine. This illustration is for demonstration purposes only.



Following this procedure is the responsibility of the installer; it will ensure that when the wing is being transported in the carry position there is no excessive "slap" or movement in the wing, which may cause premature damage to the equipment. This procedure should be repeated periodically or as require.

- **Failure to complete this procedure may result in damage to the snow gear or to the machine, and may void manufacturer's warranty.**

1. Raise front of wing to height off the ground at which you will be carrying your wing in travel. (approx.12")
2. Completely raise the rear lift group.
3. Measure the full stroke of the lift cylinder from the top of the cylinder head to the paint line on the shaft. As shown in the lower left picture.
4. Have someone lower the lift cylinder so that the measurement is now  $\frac{1}{2}$ " less than the full stroke, note this measurement.  
i.e. If the full stroke measurement is 26" lower to 25 $\frac{1}{2}$ ". Use this measurement for the rest of the procedure.
5. The bolt head at the end of the lift group (indicated by the block arrow) should contact the back of the wing at this point.
6. Visually measure distance between the bolt and the back of the wing.
7. Lower wing to a height were this bolt is easily accessible.
8. Apply a slight amount of upward pressure on the wing moldboard to support it while the bolt is removed. Making sure the wing **CAN NOT** accidentally fall.
9. Remove washers from the locknut side of the bolt and add them to the bolt head side until the head of the bolt contacts the back of the wing.
10. Raise wing fully to ensure all moving parts tighten up and there is no excessive movement in this position.

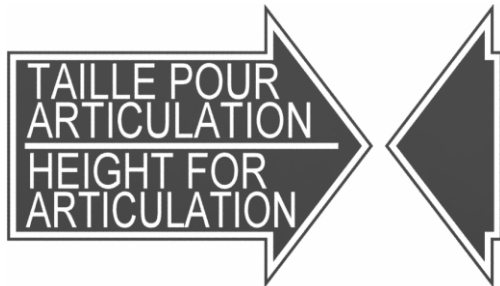
## Installation of Articulation Height Decals

The Stop Bolt must have previously been set in order to properly, see previous section.

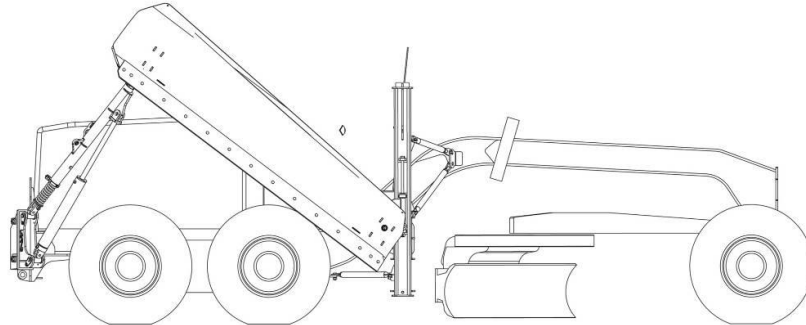
The installation of this decal gives a quick and easy way for the operator to visually know that they have the wing in a position that will not damage any part of your machine. Regardless of whether you are articulating to get out of a tight spot or simply transporting to another site.

- This is not what is referred to as the “CARRY POSITION”. The “carry position” keeps the wing as close to the grader as possible and the front of the wing is only approx. 12” off of the ground. In this position the wing **could** contact the machine in some situations. -

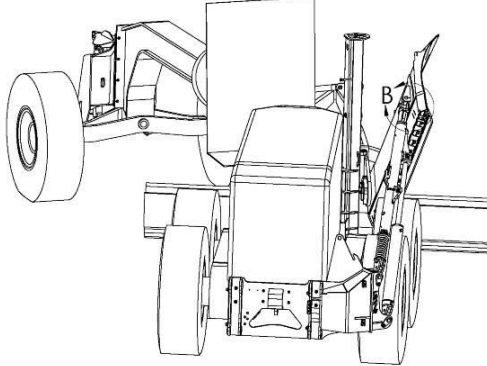
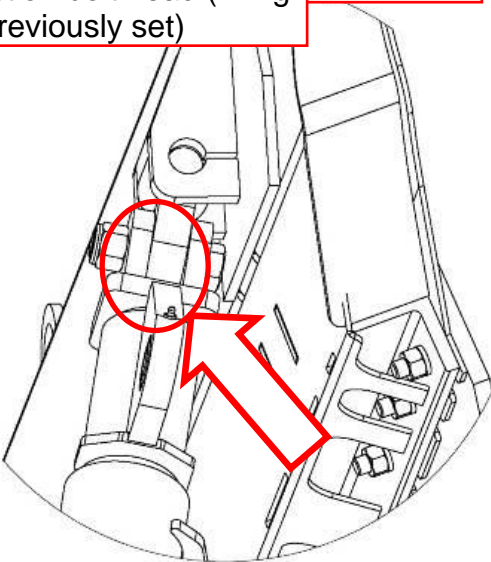

The decal shown here should be found on the back side of the cover page in this manual.



- You will require 2 people and a marker to properly install this decal.
- When this decal is installed properly, the two points of the arrow should line up from the operator's eyes. This way he can tell at a quick glance that the wing is high enough to articulate the grader safely.
- From the ground, the arrows do not line up at all.



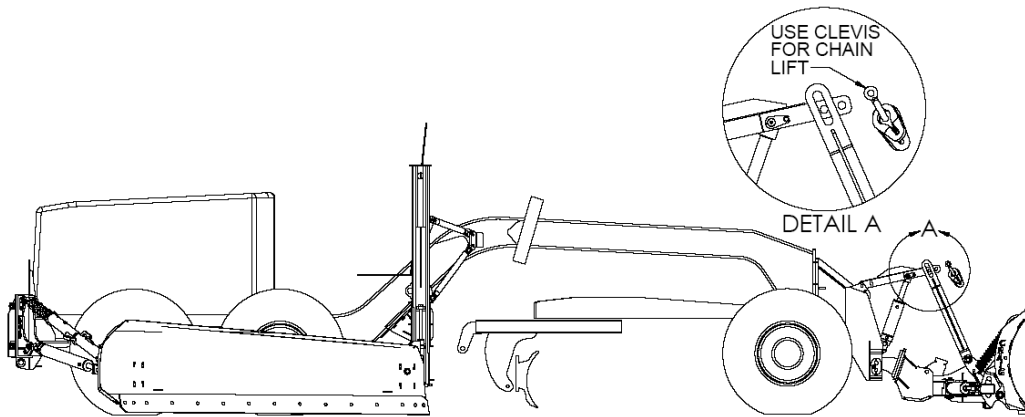
This is an illustration showing that the articulation position is higher than the carry position.

	<ol style="list-style-type: none"> <li>1. With the rear of the wing fully raised, lift the front of the wing high enough to just clear the tire or fender. As shown in the illustration above.</li> <li>2. Slowly articulate the grader to the left... Watch the bolt head at the connection point where the rear lift group is connected to the back of the wing carefully while the machine is articulating. (Shown in Detail B on next page)</li> </ol>
<p>Connection bolt head (Wing raised to the left Stop, previously set)</p>  <p>DETAIL B</p>	<ol style="list-style-type: none"> <li>3. If the bolt head contacts the back of the wing prior to full articulation, the front of the wing will need to be raised far enough to allow for full articulation to be reached.</li> <li>4. When the machine is fully articulated, there should be only slight contact between the head of the bolt and the rear of the wing. If there is no contact in this area, that is also acceptable.</li> <li>5. Do not lower the wing, it should stay in this position. Straighten the machine out and have the operator stay in the machine. The machine does not need to be running at this time.</li> <li>6. Get the supplied decals (shown above) and the man on the ground needs to get into a position where he can see the rear of the swivel bell and the rear of the front post.</li> </ol>
	<ol style="list-style-type: none"> <li>7. Take the small arrow (no writing on it), and stick it in an area on the top of the swivel bell where the operator can see just the tip of the arrow behind the front post.</li> <li>8. Before sticking the large arrow into place, the location needs to be marked. With the back still on the large arrow, place it on the rear of the front post.</li> <li>9. Have the operator line up the tips of the arrow sitting in the operating position, when the tips are lined up, use a marker and mark on the front post where the tip of the large arrow is.</li> <li>10. You can now stick the decal into place. Trim off any excess decal.</li> </ol>

Having properly completed this procedure will give the operator piece of mind. That at a glance, he can get the wing into a position where he can safely maneuver the grader as required while not worrying about what the wing is doing.

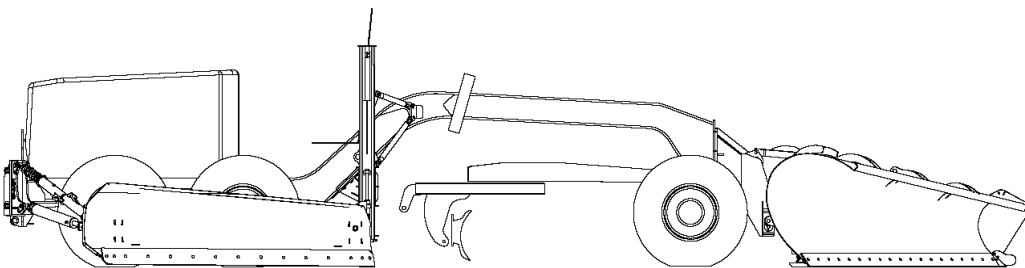
Completing this procedure is the responsibility of the installer. Failure to complete this procedure may result in damage to the snow gear, the machine, and could affect the manufactures warranty.

## **Front Mounted Plows**



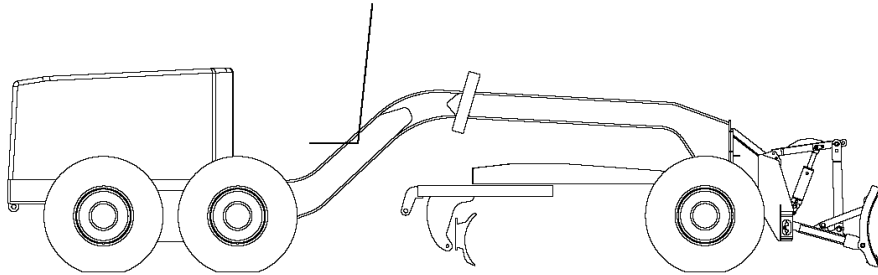
## **Hydraulic Reversible Plow**

Grader is shown with Craig 0600 Series Hydraulic Reversible Plow c/w Down Pressure arms. The detail shows the plow in float position. To apply down pressure, lower the lift group to bottom out the lift pin in this slot. (NOTE: THIS IS NOT INTENDED TO LIFT THE FRONT WHEELS OF THE GRADER OFF THE GROUND). In the float position this plow is designed to follow any imperfections in the road as pitch side to side to follow the crown. When applying too much down pressure this will be restricted.



## **Chain Lift One Way Plow**

Grader is shown with Craig 600 Series One Way Plow with chain lift. When this plow is installed there should be a small amount of slack in the chains that lift the plow. This will allow the plow to follow the imperfections in the road as well as pitch side to side to follow the crown when properly adjusted.




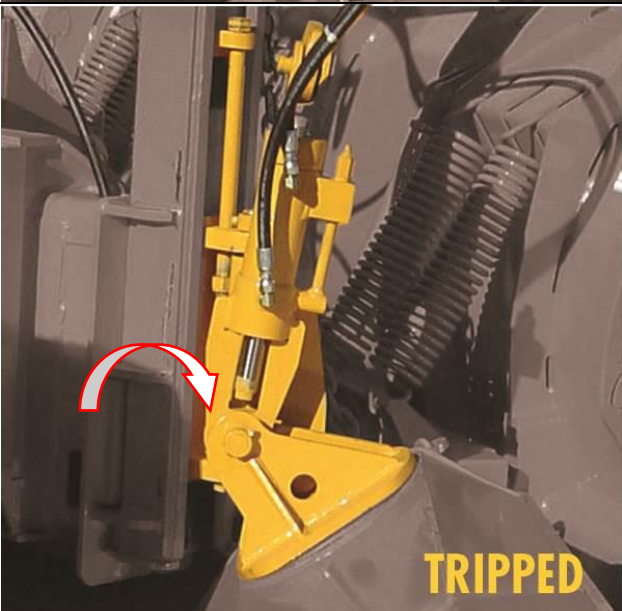
## **Craig Dozer Blade**

Grader is shown with Craig 850 Dozer Blade c/w Down Pressure. This is a rigid design any float capability should be done through the cylinder. It is designed to give you a minimum of 4" of dig depth in loose earth. (NOTE: THIS IS NOT MEANT TO LIFT THE FRONT WHEELS OF THE GRADER OFF THE GROUND).

## Hydraulic Trip Swivel (HTS-200) Operation

The Craig hydraulic trip swivel is an add-on option that can be purchased at the time of the initial order or as a separate item through our parts department at 1-800-565-5007. If ordering as a separate item, please have the serial number of your existing snow wing ready when you call.

When plowing snow it is difficult to see what lies beneath that fresh blanket of snow. The Craig HTS is designed work with virtually any Craig wing package. Having a Craig HTS packages on your snow wing will aid in the protection of your machine and snow gear.

 <p><b>UPRIGHT</b></p>	<ul style="list-style-type: none"><li>• The hydraulic trip swivel (shown in yellow) is shown here in the full upright position. This is the position that the wing should be in for everyday plowing.</li><li>• The trip swivel can also be used to adjust the angle at which the cutting edge hits the ground. This can be useful in different types of snow conditions.</li><li>• Be careful not to raise the wing in the tripped position, it could contact the front post and cause damage to either the post or the wing.</li><li>• The joints on your trip swivel should be greased as specified in the maintenance section of this manual.</li><li>•</li></ul>
 <p><b>TRIPPED</b></p>	<ul style="list-style-type: none"><li>• When a solid object is struck while plowing the wing will “trip” over to help protect your machine and the snow gear.</li><li>• When the HTS trips it can be stood up from the inside the cab. There is a decal located inside of the cab that shows how to operate the controls of your wing.</li><li>• Pull the lever indicated by the decal to return the wing to the upright position.</li></ul> <p>There is also an optional automatic return to hydraulically allow the wing to stand itself back up. The operator does not have to pull any lever in the cab. When the wing trips over the machines standby pressure will kick in and stand the wing back up.</p>

## EQUIPMENT WARRANTY POLICY *(Revised: Oct. 28<sup>th</sup>, 2014)*

### OUR COMMITMENT TO YOU

Craig Manufacturing Ltd. ("CRAIG") warrants, for a period of (12) months starting from the attachment in-service date, to the original purchaser of a product manufactured by CRAIG that the product is free from defects in design, material and workmanship. If the in-service date cannot be proven to the satisfaction of CRAIG, the original invoice date will be considered the in-service date. In no event will the in-service date be later than (12) months after the original invoice date.

If a failure occurs during the warranty period CRAIG will make every effort to get you working again, and your claim resolved, within the shortest possible time.

### WHAT TO DO IF SOMETHING GOES WRONG

If you find yourself with a CRAIG product that's causing you a problem that you suspect may be eligible for warranty you should:

- Call CRAIG Tech Support at 1-800-565-5007. Our experienced technicians may very well get you back working again with just a little technical guidance.
- If it looks like the call is going to need to be resolved through the warranty process, the technician will put you through to the Warranty Administrator for further help and guidance on how CRAIG will be working with you through your warranty claim.

**NOTE: PLEASE SEEK GUIDANCE AND APPROVAL FROM THE CRAIG WARRANTY ADMINISTRATOR BEFORE ANY REPAIR IS INITIATED. FAILURE TO DO SO CAN VOID YOUR WARRANTY.**

### WHAT INFORMATION IS NEEDED TO PROCESS A CLAIM?

**TAKE PICTURES!** As part of our goal of continuous improvement we request that all warranty claims be accompanied by photos of the failure. These are an invaluable tool in our product improvement process. If you've done APPROVED work in your shop or hired an APPROVED sublet service to resolve the failure, make sure to attach all required supporting documentation including: work orders, sublet invoices and any other related documents requested by the Warranty Administrator. "APPROVED" means approved by the CRAIG Warranty Administrator.

Please hold **ALL** defective parts for a period of 90 days after the failure. We may request that these be shipped back to our factory for inspection.\*

**NOTE:** FAILURE TO SUBMIT ALL REQUIRED INFORMATION COULD RESULT IN WARRANTY DELAY OR DENIAL. FAILURE TO COMPLY WITH CRAIG PAYMENT TERMS MAY VOID PRODUCT WARRANTY.

### IT'S FIXED! NOW HOW DO I GET COMPENSATED?

**PARTS** If a failure was caused by a part proven to be defective, it will be repaired, replaced, or at our option, credited back at dealer net value.

**REPAIR** If a failure has been repaired by an approved CRAIG dealer shop, a credit for the labour will be issued to that dealer. Acceptable repair time and rate will be determined by the CRAIG Warranty Administrator and only the hours deemed acceptable will be credited.

**LIMITED** Maximum warranty reimbursement allowed will not exceed the dealer net value of the attachment or option(s). Items such as hydraulic hoses and fittings are covered at a fixed rate. Call the CRAIG Warranty Administrator for details.

### BE REALISTIC, NOT EVERYTHING IS COVERED

Due to the nature of heavy construction and industrial snow removal, there are certain things that are simply expected to wear. These are powerful machines and inexperienced or careless operation will also cause failures.

#### WARRANTY CLAIMS WILL NOT BE CONSIDERED FOR

- FAILURES DUE TO NEGLIGENCE OR MISUSE
- ITEMS NOT SUPPLIED BY CRAIG
- TRAVEL, DOWNTIME, LOSS OF PRODUCTIVITY, LOSS OF PROFIT
- ANY ADDITIONAL WARRANTY OR BENEFIT OUTSIDE THE CRAIG WARRANTY POLICY
- EXPOSURE TO THE ELEMENTS DUE TO IMPROPER STORAGE
- PAINT OR FINISH
- ALTERED ATTACHMENTS
- PERSONAL INJURY, OR DAMAGE TO MACHINE OR PROPERTY
- WEAR ITEMS AND CONSUMABLES
- SHOP SUPPLIES OR ENVIRONMENTAL CHARGES

- All warranty-related shipping FROM CRAIG will be covered by CRAIG. All warranty related shipping TO CRAIG will be covered by the customer. Unpaid shipping TO CRAIG will result in a deduction to any warranty credit issued in the amount of unpaid shipping fees.

## **PARTS WARRANTY POLICY (Revised: Oct. 28<sup>th</sup>, 2014)**

### **OUR COMMITMENT TO YOU**

Craig Manufacturing Ltd. ("CRAIG") warrants, for a period of (12) months starting from the part delivery date to the original purchaser, any part purchased from CRAIG is free from defects in design, material, and workmanship. Parts that could reasonably be considered consumable parts are **NOT COVERED** by this warranty.

### **WHAT TO DO IF SOMETHING GOES WRONG**

If you find yourself with a CRAIG part that's causing you a problem that you suspect may be eligible for warranty you should:

- Call CRAIG Tech Support at 1-800-565-5007. Our experienced technicians may very well get you back working again with just a little technical guidance.
- If it looks like the call is going to need to be resolved through the warranty process by sending replacement parts, the Warranty Administrator will get the parts you require on the way.

**NOTE: PLEASE SEEK GUIDANCE AND APPROVAL FROM THE CRAIG WARRANTY ADMINISTRATOR BEFORE ANY REPAIR IS INITIATED. FAILURE TO DO SO CAN VOID YOUR WARRANTY.**

### **WHAT INFORMATION IS NEEDED TO PROCESS A CLAIM?**

**TAKE PICTURES!** As part of our goal of continuous improvement we request that all warranty claims be accompanied by photos of the failure. These are an invaluable tool in our product improvement process. If you've done APPROVED work in your shop or hired an APPROVED sublet service to resolve the failure, make sure to attach all required supporting documentation including: work orders, sublet invoices and any other related documents requested by the Warranty Administrator. "APPROVED" means approved by the CRAIG Warranty Administrator.

Please hold **ALL** defective parts for a period of 90 days after the failure. We may request that these be shipped back to our factory for inspection. \*

**NOTE: FAILURE TO SUBMIT ALL REQUIRED INFORMATION COULD RESULT IN WARRANTY DELAY OR DENIAL. FAILURE TO COMPLY WITH CRAIG PAYMENT TERMS MAY VOID PRODUCT WARRANTY.**

### **IT'S FIXED! NOW HOW DO I GET COMPENSATED?**

**PARTS** If a failure was caused by a part proven to be defective, it will be repaired, replaced, or at our option, credited back at dealer net value. Cost to remove and re-install are not covered under warranty.

**LIMITED** Maximum warranty reimbursement allowed will not exceed the dealer net value of the defective part. Items such as hydraulic hoses and fittings are covered at a fixed rate. Call the CRAIG Warranty Administrator for details.

### **BE REALISTIC, NOT EVERYTHING IS COVERED**

Due to the nature of heavy construction and industrial snow removal, there are certain things that are simply expected to wear. These are powerful machines and inexperienced or careless operation will also cause failures.

#### **WARRANTY CLAIMS WILL NOT BE CONSIDERED FOR**

- FAILURES DUE TO NEGLIGENCE OR MISUSE
- ITEMS NOT SUPPLIED BY CRAIG
- TRAVEL, DOWNTIME, LOSS OF PRODUCTIVITY, LOSS OF PROFIT
- ANY ADDITIONAL WARRANTY OR BENEFIT OUTSIDE THE CRAIG WARRANTY POLICY
- EXPOSURE TO THE ELEMENTS DUE TO IMPROPER STORAGE
- PAINT OR FINISH
- ALTERED ATTACHMENTS
- PERSONAL INJURY, OR DAMAGE TO MACHINE OR PROPERTY
- WEAR ITEMS AND CONSUMABLES
- SHOP SUPPLIES OR ENVIRONMENTAL CHARGES

- All warranty-related shipping FROM CRAIG will be covered by CRAIG. All warranty related shipping TO CRAIG will be covered by the customer. Unpaid shipping TO CRAIG will result in a deduction to any warranty credit issued in the amount of unpaid shipping fees.

## SERVICE WARRANTY POLICY (Revised: Oct. 28<sup>th</sup>, 2014)

### OUR COMMITMENT TO YOU

Craig Manufacturing Ltd. ("CRAIG") warrants, to the original purchaser that all services provided to the original purchaser by CRAIG will be free from defects in design, material, and workmanship from the service delivery date until the expiry of the applicable period below:

- Rebuilds, Bore Build Up/Align Bore, Custom Fabrications – Six (6) Months Warranty
- Welding Services – Thirty (30) Days Warranty

### WHAT TO DO IF SOMETHING GOES WRONG

If you find yourself with a CRAIG service job that's causing you a problem that you suspect may be eligible for warranty you should:

- Call CRAIG Tech Support at 1-800-565-5007. Our experienced technicians may very well get you back working again with just a little technical guidance.
- If it looks like the call is going to need to be resolved through the warranty process, the Warranty Administrator will facilitate the process of having CRAIG authorized personnel attend to the problem.

**NOTE: PLEASE SEEK GUIDANCE AND APPROVAL FROM THE CRAIG WARRANTY ADMINISTRATOR BEFORE ANY REPAIR IS INITIATED. FAILURE TO DO SO CAN VOID YOUR WARRANTY.**

### WHAT INFORMATION IS NEEDED TO PROCESS A CLAIM?

**TAKE PICTURES!** As part of our goal of continuous improvement we request that all warranty claims be accompanied by photos of the failure. These are an invaluable tool in our product improvement process. If you've done APPROVED work in your shop or hired an APPROVED sublet service to resolve the failure, make sure to attach all required supporting documentation including: work orders, sublet invoices and any other related documents requested by the Warranty Administrator. "APPROVED" means approved by the CRAIG Warranty Administrator.

Please hold **ALL** defective parts for a period of 90 days after the failure. We may request that these be shipped back to our factory for inspection.\*

**NOTE: FAILURE TO SUBMIT ALL REQUIRED INFORMATION COULD RESULT IN WARRANTY DELAY OR DENIAL. FAILURE TO COMPLY WITH CRAIG PAYMENT TERMS MAY VOID PRODUCT WARRANTY.**

### IT'S FIXED! NOW HOW DO I GET COMPENSATED?

**PARTS** If a failure was caused by a part proven to be defective, it will be repaired, replaced, or at our option, credited back at dealer net value.

**REPAIR** If a failure has been repaired by an approved CRAIG dealer shop, a credit for the labour will be issued to that dealer. Acceptable repair time and rate will be determined by the CRAIG Warranty Administrator and only the hours deemed acceptable will be credited.

**LIMITED** Maximum warranty reimbursement allowed will not exceed the dealer net value of **APPROVED** service work performed. Items such as hydraulic hoses and fittings are covered at a fixed rate. Call the CRAIG Warranty Administrator for details.

### BE REALISTIC, NOT EVERYTHING IS COVERED

Due to the nature of heavy construction and industrial snow removal, there are certain things that are simply expected to wear. These are powerful machines and inexperienced or careless operation will also cause failures.

#### WARRANTY CLAIMS WILL NOT BE CONSIDERED FOR

- FAILURES DUE TO NEGLIGENCE OR MISUSE
- ITEMS NOT SUPPLIED BY CRAIG
- TRAVEL, DOWNTIME, LOSS OF PRODUCTIVITY, LOSS OF PROFIT
- ANY ADDITIONAL WARRANTY OR BENEFIT OUTSIDE THE CRAIG WARRANTY POLICY
- EXPOSURE TO THE ELEMENTS DUE TO IMPROPER STORAGE
- PAINT OR FINISH
- ALTERED ATTACHMENTS
- PERSONAL INJURY, OR DAMAGE TO MACHINE OR PROPERTY
- WEAR ITEMS AND CONSUMABLES
- SHOP SUPPLIES OR ENVIRONMENTAL CHARGES