

ARCTIC

SNOWPLOWS ❁ CHASSE-NEIGE

Wing Plow Owner's Manual

ARCTIC

SNOWPLOWS ❁ CHASSE-NEIGE

KEY-POINTS

- Arctic Snowplows is the Top Canadian Manufacturer of light truck mounted plows.
- Arctic has been manufacturing the toughest, most reliable snowplows since 1969.
- Arctic is the only plow manufacturer using Heavy Armor Galvanizing for their entire product line.
- Arctic plows are built to outlast the vehicles they are put on— over 78% of Arctic plows ever sold are still in service today!
- Using high quality components, Arctic has the lowest cost of ownership over the longest period of time- with higher resale value.
- Arctic has the easiest on / off attachment system.
- All Arctic blades are power up and angle, gravity down.
- Poly plows have zero friction. With UV inhibiting materials, poly requires less maintenance than painted steel blades.
- All Arctic Commercial grade plows come standard with skid shoes, curved deflector and blade guides.
- Some manufacturers trip edge blade base angles double as a “cutting edge”- ALL Arctic trip edge blades include a hardened steel cutting edge bolted to the base angle.

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* QUIK*LINK™ is a trademark of Arctic Equipment Manufacturing Corporation

Safety and warnings

Before attempting any procedure in this book, read and understand all the safety information contained in this section. In addition, ensure all individuals working with you are also familiar with these safety precautions.

For your safety, warning and information decals have been placed on this product to remind the operator to take safety precautions. It is important that these decals are in place and are legible before operation begins. New decals can be obtained from Arctic Equipment Manufacturing or your local dealer.

Remember it is the owner's responsibility for communicating information on the safe use and proper maintenance of this equipment. The careful operator is the best operator. Most accidents are caused by human error. Certain precautions must be observed to prevent the possibility of injury to operator or bystanders and/or damage to equipment.

-Servicing the snowplow (hydraulic power system, hoses, hydraulic cylinders, controllers, wiring harnesses, lights, blade frame, blade moldboard, A-frame, quadrant, lift frame and vehicle undercarriage) without special tools and knowledge could result in personal injury. See an authorized Arctic dealer for service.

-Do not allow hands, hair or clothing to get near any moving parts such as fan blades, belts and pulleys.

-Do not wear neckties or loose clothing when working on the vehicle. These things can catch on moving parts or cause an electrical short circuit that could result in personal injury. Do not wear wrist watches, rings or other jewellery when working on the vehicle or individual equipment

-Do not allow unauthorized person to operate this unit.

-Do not exceed 70 km/h (45 mph) when snow plow is attached to vehicle. Braking distances may be reduced and handling characteristics may be impaired at speeds above 70 km/h.

-Do not exceed 15 km/h (10 mph) when plowing. Excessive speed may cause serious injury and damage of equipment and property if an unseen obstacle is encountered while plowing.

-All new vehicles are equipped with an airbag sensor, mounted on front of them. Do not alter the position of that sensor or any other component related to the operation of airbag.

-Careless or high-speed driving with a plow attached, which results in vehicle's deceleration may activate airbag sensor, resulting in airbag deployment.

-Do not place fingers in A-frame or mount lug holes to check alignment when attaching snow plow. Sudden motion of the plow could severely injure a finger.

-Do not stand between the vehicle and the blade or directly in front of blade when it is being raised, lowered or angled. Clearance between vehicle and blade decreases as blade is operated and injury or death can result from the blade striking a body or dropping on hands or feet.

- Do not work on a vehicle without having a fully serviced fire extinguisher available. (Dry chemical unit specified for gasoline, chemical or electrical fires).
- Do not smoke while working on the vehicle. Gasoline and battery acid vapours are extremely flammable and explosive.
- Do not alter the snow plow, or any part without written approval of Arctic Equipment Manufacturing Corporation.
- Do not use your hands to search for hydraulic fluid leaks; escaping fluid under pressure can be invisible and can penetrate the skin and cause injury.
- Inspect bolts and pins whenever attaching or detaching the snowplow, and before travelling. Also inspect the snow plow periodically for defects. Worn or damaged components could result in the plow dropping to the pavement while driving, causing an accident. Parts that are loose, broken, missing or plainly worn must be tightened or replaced immediately.
- Keep hands and feet clear of blade and A-frame when attaching or detaching plow.
- Check the job site for terrain hazards, obstructions and people. Check surrounding area for hazardous obstacles before operating this unit.
- Wear safety goggles when working on the vehicle to protect your eyes from battery acid, gasoline, and dust or dirt from flying off of moving engine parts.
- Be aware of and avoid contact with hot surfaces such as engine, radiator, and hoses.
- Wear safety glasses with side shields when striking metal against metal. Failure to heed could result in injury to the eye(s) or other parts of the body.
- Position blade so it does not block path of headlamps beam. Do not change blade positions while travelling. An incorrect plow position blocking headlamp beam may result in an accident.
- Shut off the vehicle engine, place the transmission in neutral or park, turn the ignition switch to the "off" position, firmly apply the parking brake of the vehicle before attaching or detaching the blade from the vehicle or when making adjustments to the blade.
- Be sure that the plow is properly attached before moving the vehicle.
- To avoid corrosion, extend the life of the control module & ensure proper plow functionality keep all connectors well-greased with dielectric grease.
- Excessive stacking of snow causes undue stress to the snowplow and the vehicle. It may result in the failure of the plow components and it can cause damage to the vehicle.

Snow Plow Warranty

Starting September 1st 2020, ARCTIC Snowplows are guaranteed to be free from defects in material or workmanship under normal use and service for 2 (two) years after the date of purchase of a complete snow plow package (complete snowplow package includes: hydraulic power system, hoses, hydraulic cylinders, controllers, wiring harnesses, lights, blade frame, blade moldboard, A-frame, quadrant, lift frame and vehicle undercarriage).

Arctic Equipment Manufacturing Corporation (Arctic Equipment) will replace or repair, at its election, without charge, any part which becomes defective within the period of time described.

The maintenance records and a bill of sale/sales receipt will be requested in the event of a claim.

Warranty does not cover:

- Problems caused by failure to follow instructions and failure to maintain the product as described in the owner's manual.
- Damage to the product that has been subject to misuse, neglect, accident, or improper installation, maintenance, care or storage.
- Damage caused by parts not used in accordance with their intended purpose.
- Paint or surface coating deterioration, expendable parts such as, but not limited to, pins, springs, cutting edges, controller keypad, bushings, shoes, blade guides, seal beams, light bulbs, nuts and bolts or tightening nuts and bolts which are considered normal maintenance.
- Damage resulting from rust, corrosion, freezing or overheating; failure to maintain proper fluid/lubrication levels, failure to retighten fasteners, or operation of the plow without shoes.
- Damage due to abrasion of wiring harnesses or hydraulic hoses.
- Travel time incurred to and from dealers or suppliers, accommodations, meals, cost of tax, freight to/from dealers, storage charges, environmental charges, solvents, sealants, lubricants, or any other normal shop supplies.
- Problems caused by accessories and parts that are not supplied by Arctic Equipment.
- Liability for damage to the property, or injury to, or death of any person arising out of the operation, maintenance or use of the covered product.
- Damages on the plow or the truck caused by excessive stacking of snow (All Arctic snowplows have a stop built in, to prevent the blade from contacting the bottom of the bumper. If the blade is pushed too high on the snowbank, the stop will bind and cause the truck's weight to be supported by the plow. This can cause damage to the A-frame, cylinders, lift frame and mounting kit, as well as the trucks bumper and frame. Don't stockpile. Leave that for the loaders. Excessive stacking of snow causes undue stress to the snowplow components and the vehicle, which can result in the failure of the plow components and damage to the vehicle.)
- Arctic Equipment makes no warranty, either express or implied, with regard to the deployment of any safety airbag.

Arctic Product's Liability is expressly limited to repair or replacement of defective parts. Arctic Equipment shall not be liable for any consequential, incidental, or contingent damages whatsoever, whether for breach of contract, breach of warranty, negligence, or other tort, or on any strict liability theory.

The customer must register their snowplow with Arctic using the available registration system found under Arctic's website www.arcticsnowplows.com **within 60 days from the day of purchase**. In order for the customer to be eligible for warranty every year, the snowplow, inclusive of all components, must be returned to an authorized Arctic dealer every spring for preventative maintenance (it is done at the customer's expense). Failure to do so will nullify any future warranty claims. Replacement parts installed by Arctic dealer will be covered 90 days under the warranty or balance of original purchase warranty, if greater than 90 days. Also individual parts, components, or accessories are covered 90 days under the warranty (no labour).

All installations, warranty and preventive maintenance work must be completed by an authorized dealer and/or installer approved by Arctic Equipment as otherwise warranty will be deemed null and void.

This warranty is made only to the original purchaser. There is no other warranty expressed, implied, or statutory.

Arctic Equipment reserves the right to change specification without prior notice.

Customer Responsibility

The loaded vehicle, including all after market accessories, the snowplow, passengers and cargo, **MUST NOT** exceed the gross vehicle weight ratings (GAWR), front gross axle weight rating (FGAWR) or rear gross axle weight rating (RGAWR) specified on the Safety Compliance Certification Label located in the driver's side door opening. It is the operator's responsibility to verify that these rating are not exceeded. To determine the Gross Axle Weights for your vehicle, including all after market accessories, the snowplow, passengers and cargo, take your loaded vehicle and the snowplow to a scale. With the snowplow attached, place the front wheels of the vehicle on the scale to get the front gross axle weight (FGAW). To get the rear gross axle weight (RGAW), place the back wheels of the vehicle on the scale.

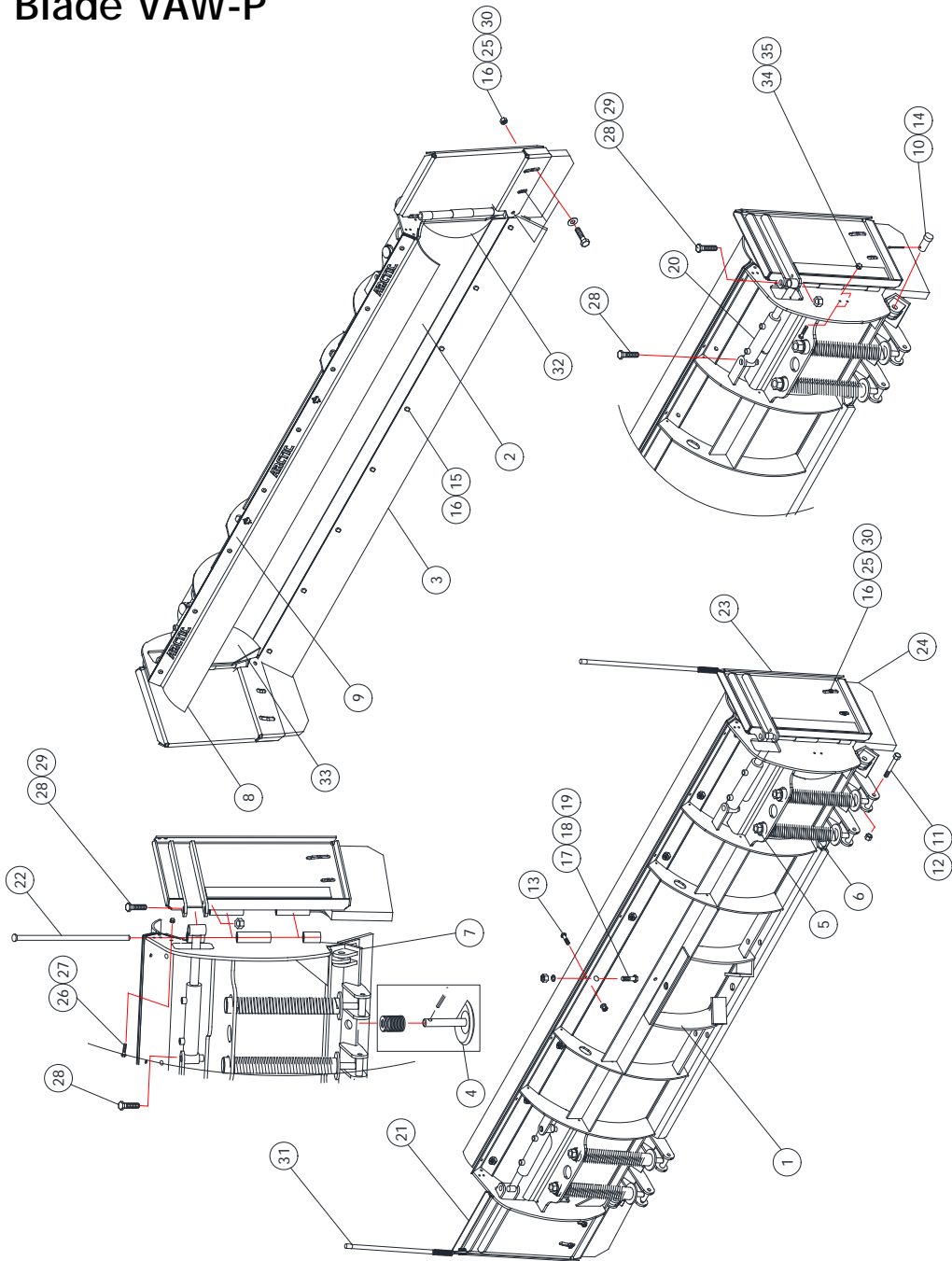
The addition of ballast weight placed rearward of the rear axle may be required to prevent exceeding the FGAWR and provide good vehicle breaking and handling. When ballast is required it must be secured behind the rear wheels in a manner, which prevents it from sliding during normal driving.

Disclaimer notice

Arctic Equipment Manufacturing Corporation (Arctic) does not assume liability for damage to your motor vehicle resulting from the attachment or use of an Arctic snowplow. The purchaser assumes all vehicle risk associated with the attachment and operation of this snowplow.

The Arctic snowplow you purchase must be used only on vehicles equipped with the manufacturer's snowplow preparation packages. Snow plowing without the original plow preparation package may damage your vehicle. The added weight may impair the operation and control of your vehicle. Snow plowing with a vehicle not recommended for that purpose by the manufacturer may void your new vehicle warranty. If your vehicle is not equipped with an original snow plow preparation package, additional equipment may be necessary before snow plowing. Please consult your vehicle and snowplow dealers prior to the purchase and installation of the snowplow. The installation of such parts however is not a full substitute for the original equipment snowplow preparation package.

WING Blade VAW-P

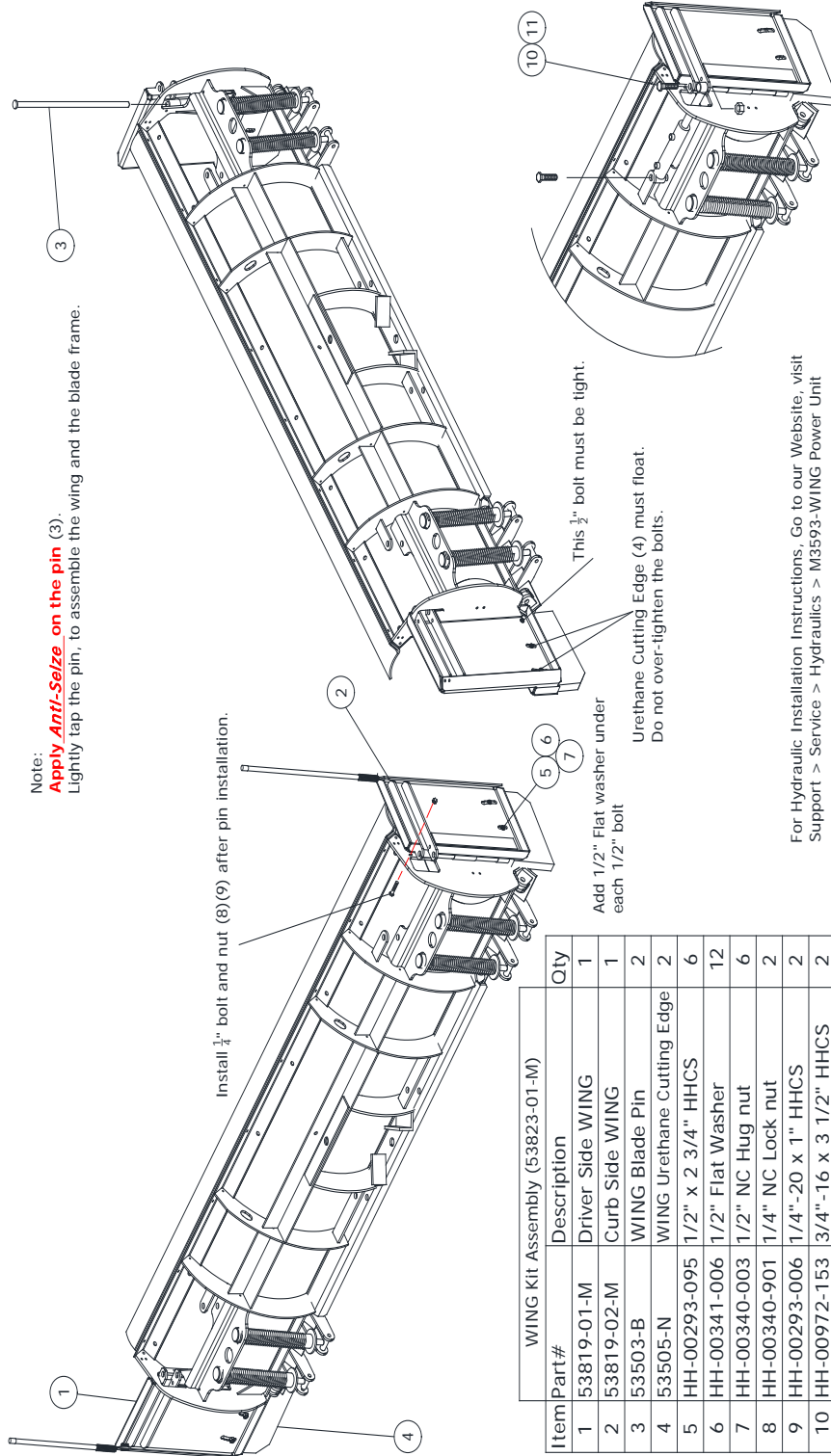


WING BLADE PARTS LIST

Item	Part number	Description	Quantity
1	53812-D	96" Wing Blade Frame	1
2	52228-03-D	3/8" x 24" x 96" Orange Poly Skin	1
3	52234-M	96" Offset Cutting Edge	1
4	53322-M	Trip Edge Shoe Assembly	2
5	52440-C	Spring Tube Assembly	4
6	52441-M	Trip Edge Compression Spring	4
7	52443-04-D-GA	96" Base Angle	1
8	52246-CR	96" Curved Deflector	1
9	52240-M	96" Deflector Strap	1
10	52442-A	3/4" X 2.1/8" Rivet	6
11	HH-00540-004	1/2-20 Nylon Inserts	4
12	HH-00972-100	1/2-20x4 HHCS	4
13	52288-M	Deflector Bolt Bag kit (consist of 13a, 13b & 13c)	1
13a	HH-00971-043	5/16" x 1" UNC Carriage bolt	8
13b	HH-00457-007	5/16" Lock washers	8
13c	HH-00294-002	5/16-18 Hex Nut	8
14	HH-00020-107	5/32" X 1.1/4" Cotter Pin	6
15	HH-00971-137G8	1/2-13 X 1.3/4 Carriage Bolt	8
16	HH-00340-003	1/2" Nc Hug Nut	14
17	HH-00971-136	1/2-13x1.1/2 Carriage Bolt	8
18	HH-00457-001	1/2 Lockwasher	8
19	HH-00294-005	1/2-13 Hex Nut	8
20	53488-N	Wing Cylinder	2
21	53819-01-M	Driver Side Wing (Wing only)	1
22	53503-B	Wing Blade Pin	2
23	53819-02-M	Curb Side Wing (Wing only)	1
24	53505-N	Wing Rubber Cutting Edge	2
25	HH-00293-095	1/2x2.75" Bolt	6
26	HH-00340-901	1/4 Course Lock Nut	2
27	HH-00293-006	1/4-20x1 HHCS	2
28	HH-00972-153	3/4-16x3.1/2 HHCS	4
29	HH-00973-007	3/4-16 Nut Nylon	4

WING BLADE PARTS LIST

Item	Part number	Description	Quantity
30	HH-00341-006	½" Flat Washer	12
31	50999-B	Plow Guide	2
32	53822-01-B	Driver Side Diverter Plate	1
33	53822-02-B	Curb Side Diverter Plate	1



Note:
Apply Anti-Seize on the pin (3).
Lightly tap the pin, to assemble the wing and the blade frame.

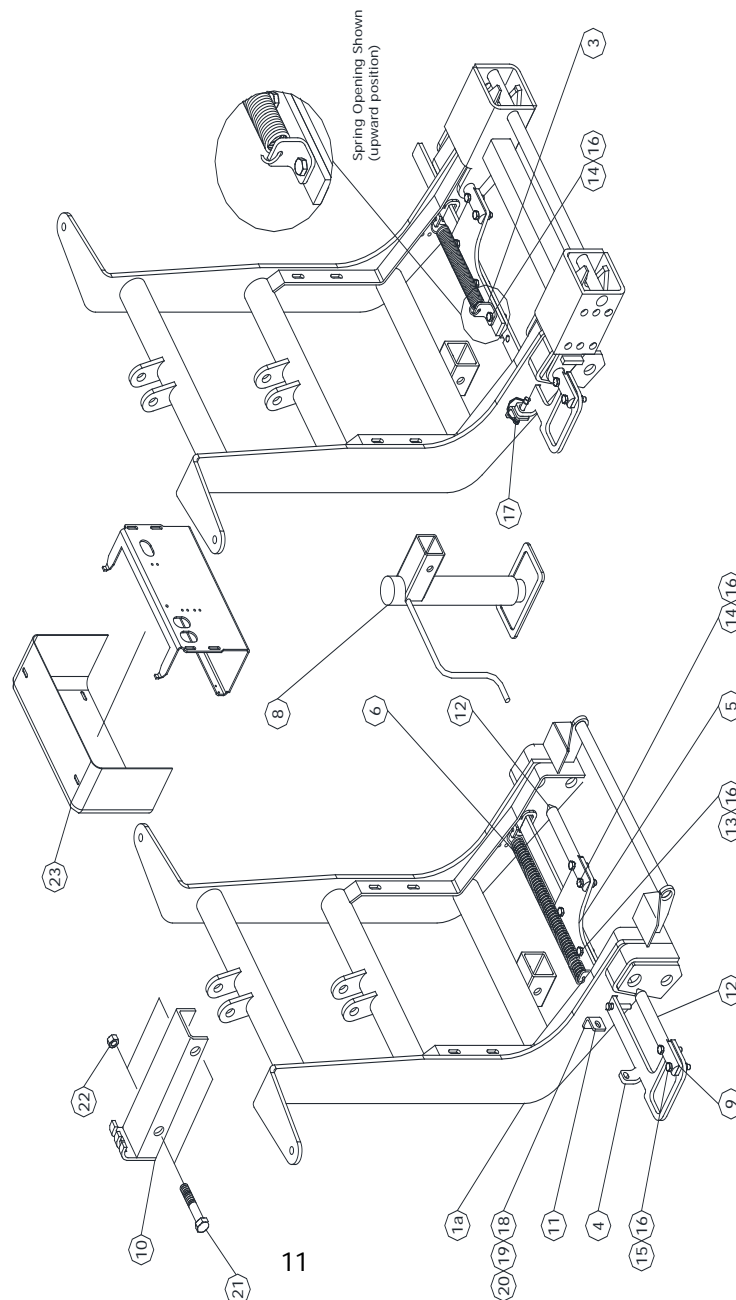
Install 1/4" bolt and nut (8)(9) after pin installation.

This 1/2" bolt must be tight.
Urethane Cutting Edge (4) must float.
Do not over-tighten the bolts.

WING Kit Assembly (53823-01-M)		Qty
Item	Part#	Description
1	53819-01-M	Driver Side WING
2	53819-02-M	Curb Side WING
3	53503-B	WING Blade Pin
4	53505-N	WING Urethane Cutting Edge
5	HH-00293-095	1/2" x 2 3/4" HHCS
6	HH-00341-006	1/2" Flat Washer
7	HH-00340-003	1/2" NC Hug nut
8	HH-00340-901	1/4" NC Lock nut
9	HH-00293-006	1/4"-20 x 1" HHCS
10	HH-00972-153	3/4"-16 x 3 1/2" HHCS
11	HH-00973-007	3/4"-16 Nylon Inserts

For Hydraulic Installation Instructions, Go to our Website, visit Support > Service > Hydraulics > M3593-WING Power Unit

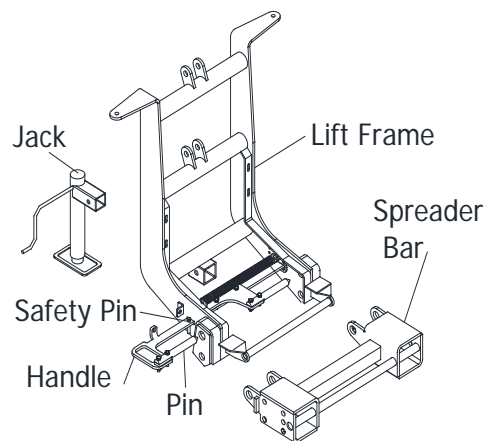
Lift frame Hi-Boy QUIK*LINK™ IV (QLIV) HI



LIFT FRAME HI-BOY QUIK*LINK™ IV (QLIV) HI-DLC

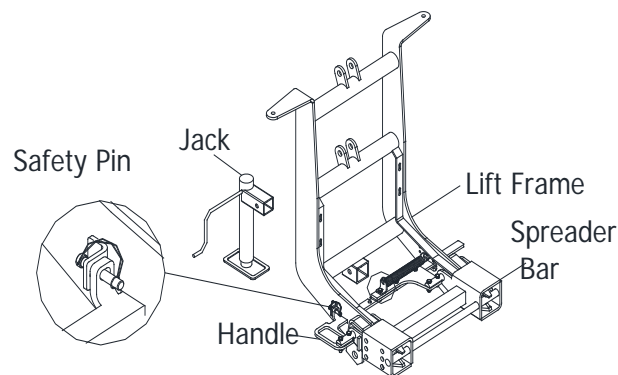
Item	Part number	Description	Quantity
1	53517-D	Lift Frame QLIV	1
2	53216-M	Single Lift Chain Kit	1
3	53179-M	Spring Bracket	1
4	53177-M	Handle	1
5	53178-M	Top Plate	1
6	53182-N	Spring	1
7	50999-B	Blade Marker	1
8	52373-M	Jack Assembly	1
9	53180-M	Spacer	1
10	52612-B	Lift Channel Double Chain	1
11	53174-M	Lock Bracket	1
12	53181-M	Pin	2
13	HH-00293-050	3/8-16x1.1/4 Hex Head Cap Screw	2
14	HH-00293-051	3/8-16x1.1/2 Hex Head Cap Screw	3
15	HH-00293-053	3/8-16x2 Hex Head Cap Screw	2
16	HH-00340-001	3/8-16 Nut (Nylon Insert)	7
17	53183-N	Hitch Pin	1
18	HH-00294-001	1/4-20 Hex Nut	2
19	HH-00457-006	1/4 Lock washer	2
20	HH-00293-006	1/4-20x1 Hex Head Cap Screw	2
21	HH-00972-155	3/4" x 4" UNF Cap screw	2
22	HH-00973-007	3/4" Lock Nut	2

Blade removal with QUIK*LINK™ IV attachment



1. Locate a spot that is as level as possible. With the blade positioned at 90° to the truck lower the blade and leave the switch in the float position.
2. Insert the jack into the receiver on the lift frame and lower the leg while holding and pulling slightly on the spring loaded handle, until the handle pulls out easily and locks in place.
NOTE: If the jack is lowered too far it will "wedge" the lift frame into the spreader bar. Lock the handle in the open position and secure with the safety pin down through the handle.
3. Unplug the lights, power unit and battery cables from the truck.
4. Back the truck away from the plow assembly. It may be necessary to accelerate the truck back with a quick "snap" in order to allow the truck to break free from the plow.
5. Return control to neutral or shut off switch. Install dummy plugs into harnesses.

Blade reinstall with QUIK*LINK™ IV attachment



1. Drive up to plow assembly until spreader bar is about to make contact with lift frame.
2. Get out of truck to check that the lift frame is aligned with the spreader bar. If necessary use jack to adjust the height or move truck to align sideways.
3. Drive truck forward until you start to push the plow.
4. With plow fully engaged, pull out the safety pin on the spring loaded handle and let it fully engage the pins in place, and reinsert the safety pin to lock the handle. Remove the jack.
5. Remove dummy plugs and reconnect battery cables, power unit and lights.

NOTE: Aligning the truck to the plow is made easier by establishing a reference point on the hood of the truck to line up the lights on the plow.

Warning: Before traveling be sure that pins, all bolts and spring are in place. Safety pin must be in place and locked all the time.

M3593-wing power unit operating information

General Information about Power Unit M3593-WING

Warranty Identification

For purposes of warranty consideration, recording the serial number of the power unit is necessary. This serial number is displayed on the reservoir of the power unit.

Maintenance

Under normal operating conditions, the M3593-WING should not require servicing during the plowing season, provided post season maintenance has been carried out. Periodically, and during post season maintenance, make sure the electrical connections are very well greased, tight and free of corrosion. The terminals, coils and all electrical connections must be covered with dielectric.

It is recommended that after every season the hydraulic fluid to be changed. (For the first 3 years after purchase a preventive maintenance schedule must be performed in order to extend your warranty- please see your dealer for details) The replacement fluid is **UNIVIS J13 (HVI 13)** hydraulic fluid. Automatic transmission fluid is not recommended for this system and may lead to aeration of the oil in very cold weather conditions. Use of any fluid other than J13 will void warranty. The oil level in the reservoir is to be within ½" from the top surface (when lift cylinder is collapsed).

When draining the hydraulic fluid, the hoses at the cylinders should be disconnected and drained. With the hose disconnected, the cylinders should be collapsed to displace the oil out of the cylinder.

Periodically, and during post season maintenance, make sure the electrical connections are tight and free of corrosion. The terminals must be covered with grease for additional protection from corrosion.

Electrical System

Frequently problems develop due to an undersized electrical charging and storage system. Generally, the heavier the usage, the heavier the system should be. For heavy usage and in the case where a number of other devices are run off the battery simultaneously, heavier ratings are strongly recommended.

Electric Motor

The 8111-I electric motor is an electromagnetic motor, consisting primarily of an armature/commutator, two field coils, four brushes in a brush holder set, and a tubular steel body with cast endcap. The power unit with this motor is equipped with the pump that offers optimum performance.

Hydraulic Pump

The hydraulic pump converts mechanical energy transmitted by the prime mover (in this case a 12 volt DC electric motor) into hydraulic energy. The hydraulic energy is due to flow (kinetic energy) and pressure (potential energy). The rate of energy output is expressed in horsepower.

At the inlet, as the gears unmesh, the volume in the cavity increases thereby causing fluid to enter. This fluid is then carried between the gears and the housing to the other side of the gears into the outlet cavity. At this point the gear teeth mesh. The outlet cavity volume decreases, causing fluid to flow into the system. Note that without a load, the pressure at the outlet port is nil.

The pressure at the outlet of the pump is due to external loads placed on the system. These loads can be transmitted through cylinders and linear actuators as well as hydraulic motors and rotary actuators. In practice, system components by virtue of orifice and line sizes, offer some resistance to the flow of fluid. This translates into pressure at the outlet of the pump.

Valve Information

Pressure Relief Valve

The pressure relief valve consists of a ball, a retaining spring and a seat. The ball is exposed to the pressure in the outlet line from the pump. This pressure acting on the exposed area of the ball causes a force on the retaining spring. When the pressure is such that the force on the ball exceeds the force in the spring (due to a preset amount of precompression) the ball lifts off the seat and the fluid from the outlet of the pump is allowed to flow back to the reservoir. The "standard relief valve setting" for the M3593-WING is 2250 psi.

Directional Valves

The M3593-WING circuit contains 7 directional valves identified as 'A', 'C', 'D', 'E', 'F', 'G' and 'H' and they are 3 way, 2 position spool valves. Valve 'B' is a 2 way 2 position normally closed poppet valve.

A basic directional valve consists of a valve cartridge and a coil. Inside the cartridge valve, an armature is attached to the valve mechanism.

The coil consists of a wire wrapped around a spool. When power is applied to the coil (the coil is energized), the magnetic field created by coil pulls the armature into the coil. The armature shifts the valve mechanism into the energized position. When power is removed from the coil, a spring inside the valve cartridge pushes the armature and valve mechanism to the de-energized position.

Directional Valve 'B'

Valve 'B' is a 2 way 2 position normally closed poppet valve which is used for lowering the plow. In the de-energized position, valve B acts as a check valve allowing pump flow to the lift cylinder but preventing return flow from the lift cylinder to the reservoir. Energizing valve B opens the valve and

allows flow from the lift cylinder to the reservoir thereby lowering the plow. Note: the lift cylinder is connected to C3.

Directional Valves 'A', 'C', 'D', 'E', 'F', 'G' and 'H'

Directional Valves 'A', 'C', 'D', 'E', 'F', 'G' and 'H' are 3 way, 2 position spool valves. Directional Valve 'C' operates the lift cylinder on C3 port. Directional Valves 'A' and 'D' operate the left and right angling cylinders. Directional valves 'E', 'F', 'G' and 'H' operate wing cylinders.

In the de-energized position, the valves block flow from pump to the cylinder but allow return flow from the cylinder to the reservoir. In the energized position, flow from the pump to the cylinder is permitted but flow from the cylinder to the reservoir is not.

Note: When angling the plow, one cylinder is extending and the other is retracting therefore one cylinder is receiving oil from the pump and the other is returning oil to the reservoir. Valves 'A' and 'D' must work together same as valves 'E' and 'F', and 'G' and 'H'.

Pressure Compensated Flow Control

When B valve is energized oil from a lift cylinder is going through the orifice to the tank. There is also pressure compensated flow control 1 gpm that restricts flow from the wing cylinders. A pressure compensated flow control valve automatically compensates for pressure changes and maintains its setting even as work load changes.

Cross over relief valve

The cross over relief valves are provided to protect the valves and manifold from the pressure spikes created when the plow strikes an object. The cross over relief valves are similar in construction to a regular direct acting relief valve. Cross over valves when activated, bleed fluid from C1 to C2 or vice versa. X overs on C4, C5, C6 and C7 direct flow to the tank.

In this manner both the angling cylinders, the plow frame and the truck frame are offered some protection from the normal impact forces associated with plowing. Striking a fixed object while plowing at high speeds will damage the cylinders and perhaps the plow. The cross over relief valves are adjustable and are normally set at about 3,000 psi.

Pilot Operated (PO) Check Valve

A dual pilot operated check valve (PO Check Valve) is provided on ports C1 and C2 to hold the plow at the desired angle. Also PO check valves are installed on ports C4 & C5 same as C6 and C7. Without the PO Check valves, leakage through directional valves would allow the plow or the wings to drift.

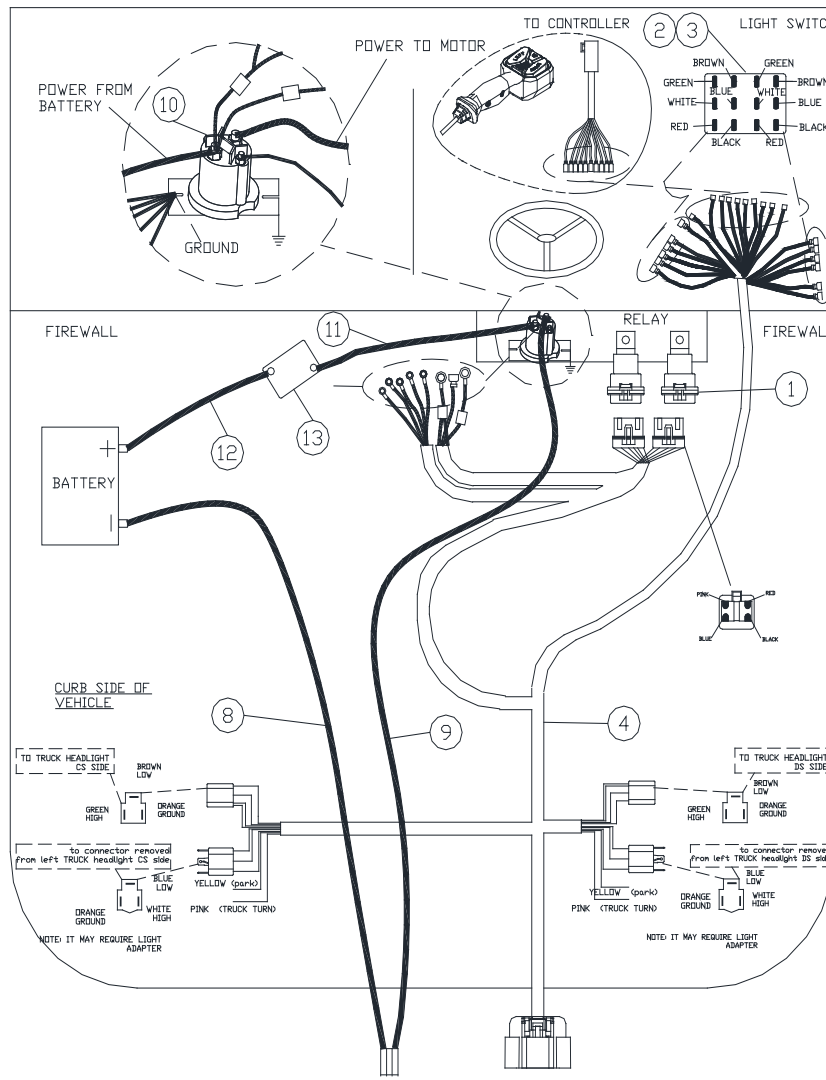
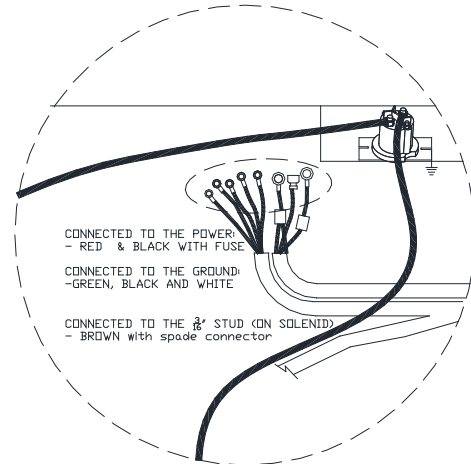
Without pilot pressure, a pilot operated check valve (PO check valve) allows flow in only one direction. In the free flow direction, oil flowing through the valve lifts the poppet of the seat. In the opposite direction, returning oil pushes the poppet against the seat thereby blocking flow. When pressure is applied to the pilot piston, the poppet is lifted off the seat and flow in both directions is permitted. When angling, pilot pressure is provided for the check valve returning oil to the reservoir. For example; when valve 'D' is energized pump flows oil to C1. Oil is allowed to return oil through the check valve to the reservoir because the pressure on C1 is acting on the pilot piston of the C2 PO Check Valve. PO check valve operates same on the ports C4, C5, C6 and C7.

Control Switch

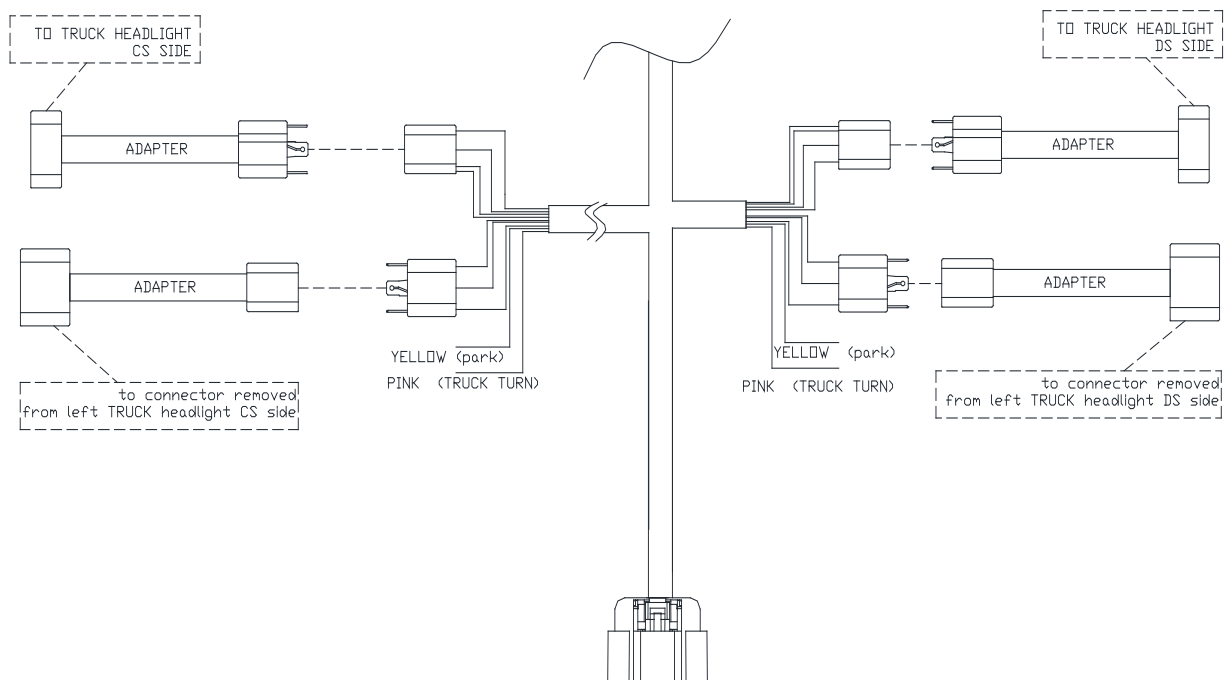
The M3593-WING uses a handheld controller. Handheld controller - all control functions automatically time out (shut off) after 6-8 seconds. This helps to reduce wear on the motor and to prevent battery drain. After being idle for approximately 20 minutes the controller will automatically turn off and the indicator light located at the center of the keypad will blink from red to green. To restart the control, turn the control OFF (ON/OFF switch) and then back ON

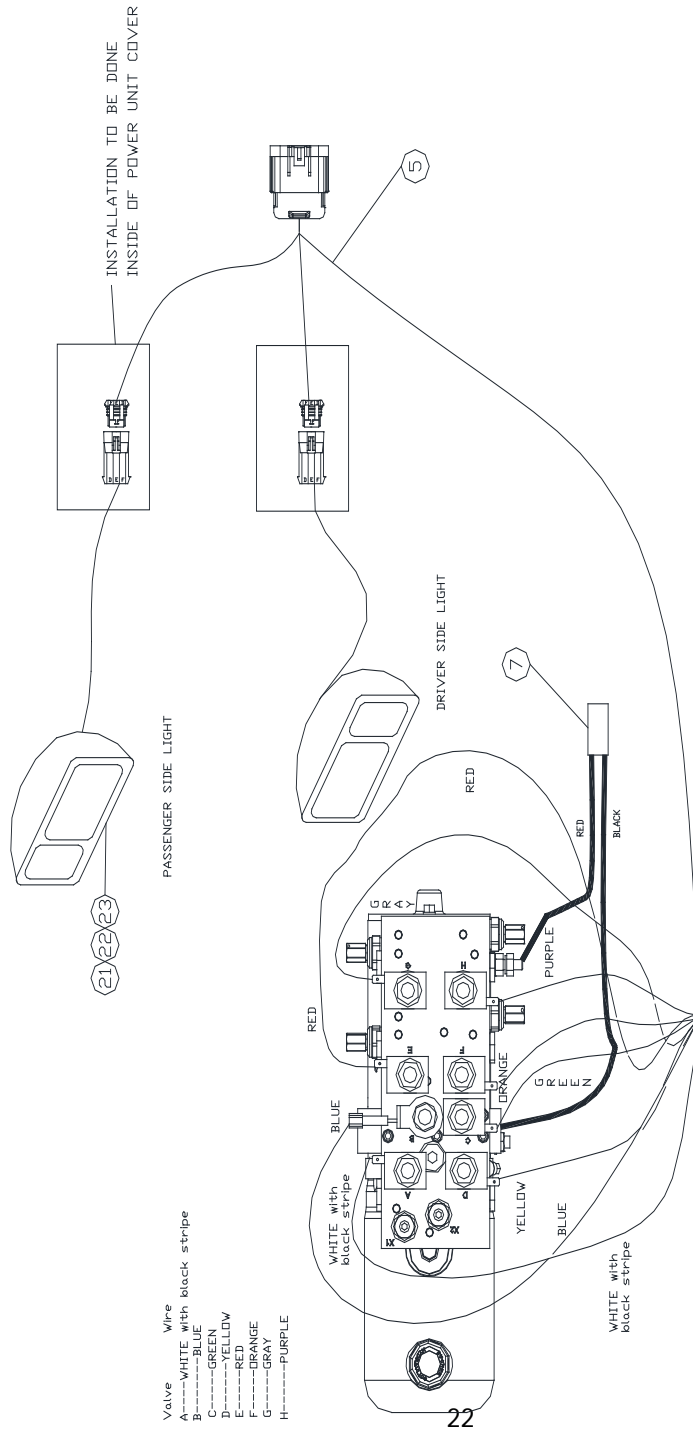
ELECTRICAL INSTALLATION ONE PIECE HARNESS			
Item	Part number	Description	Quantity
1	800041	Relay	2
2	184069-12	12 Pole Light Switch Kit	1
3	52018-M	Light Switch Bracket Kit	1
4	53470-B	One Piece Harness	1
5	53624-B	Lift Frame Harness	1
7	53476-B	18" Cable Plug Assembly	1
8	53477-B	90" Ground Cable (Black)	1
9	53478-B	90" Power Cable (Red)	1
10	FP17757	Solenoid	1
11	51335-56-M	Battery Cable, 56"	1
12	51335-22-M	Gauge Battery Cable, 22"	1
13	53608-N	Circuit Breaker	1
14	52427-N	Red Terminal Protector	1
15	53560-A	Dummy Plug (Power & Ground)	1
16	HH-00293-006	¼" -20x1 HHCS	1
17	HH-00294-001	¼" -20 Hex Nut	1
18	HH-00457-006	¼" Lockwasher	1
19	HH-00293-026	5/16" -18x3/4 HHCS	1
20	HH-00457-007	5/16" Lockwasher	1
21	53495-1PC	Handheld Controller, c/w adapter 53487-B	1

One piece harness installation



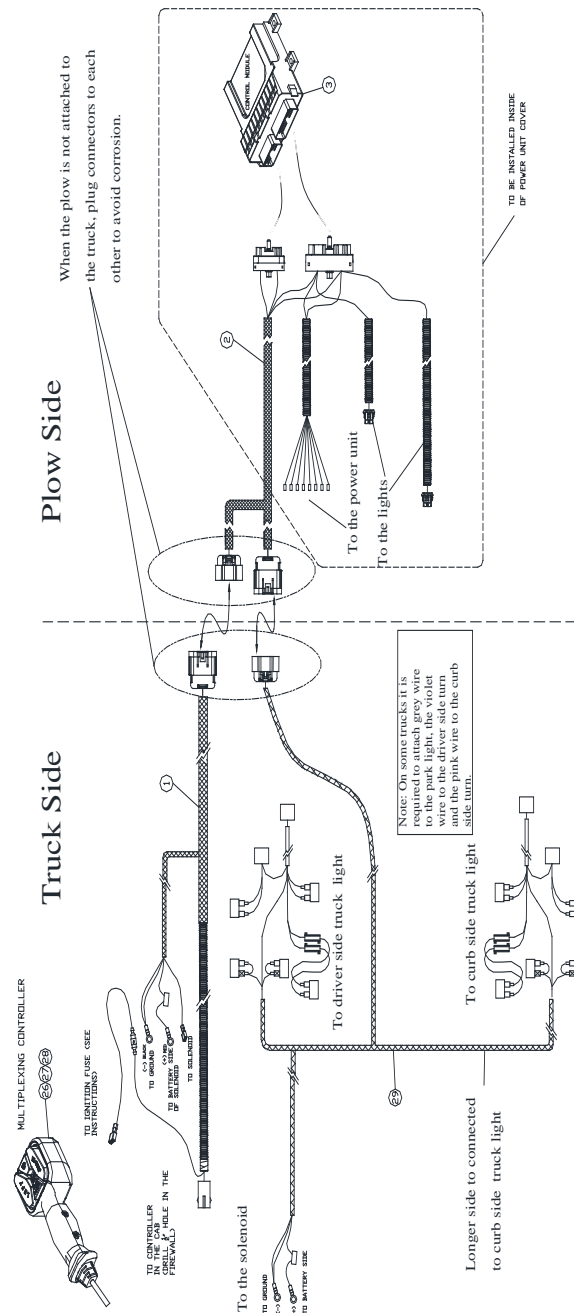
IF THE VEHICLE REQUIRES LIGHT ADAPTERS

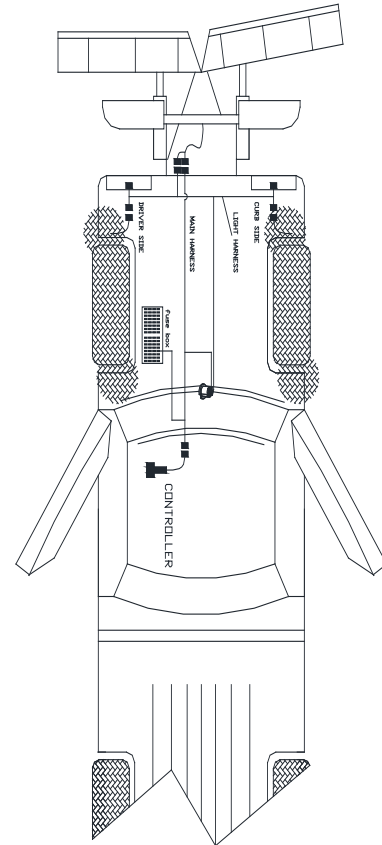
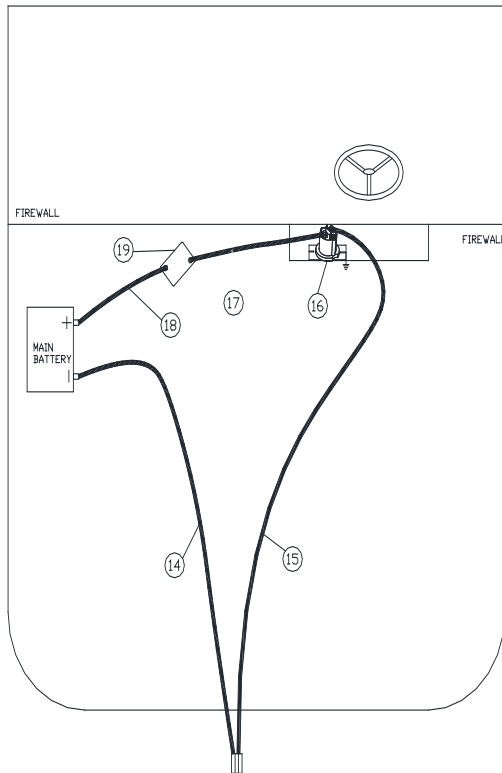




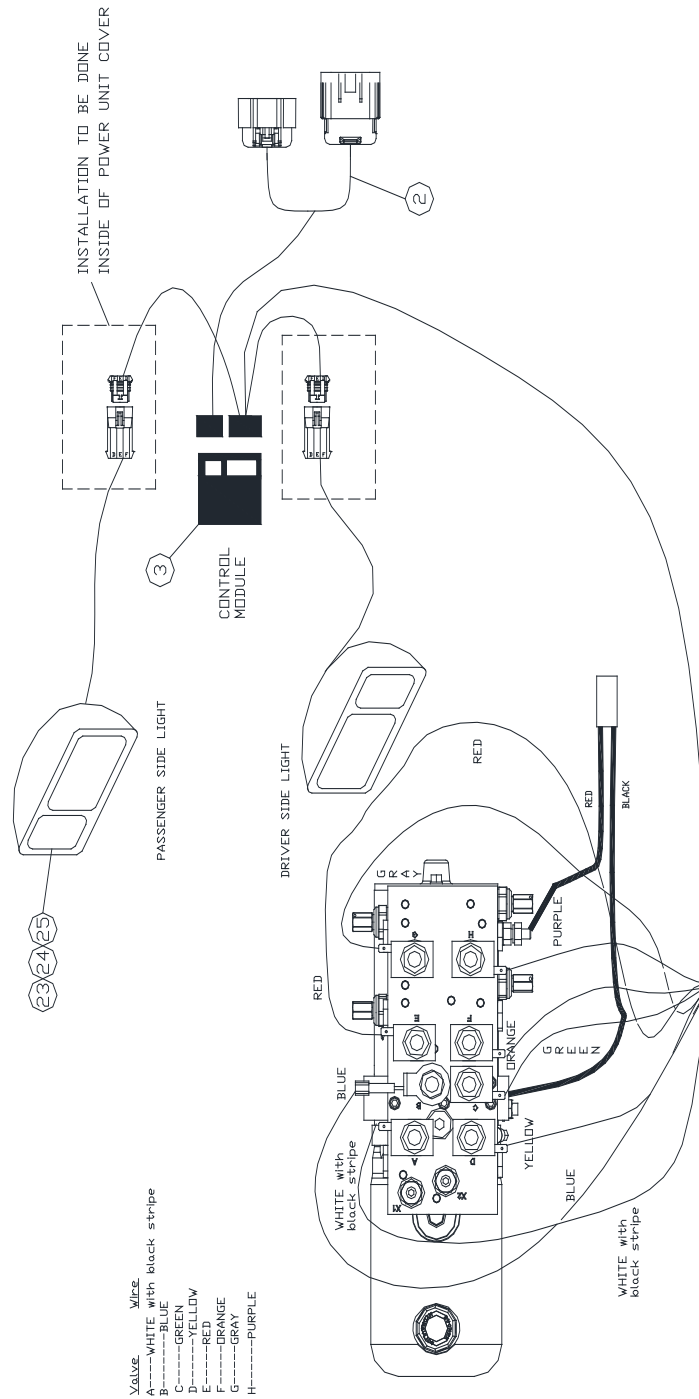
ELECTRICAL INSTALLATION MULTIPLEXING			
Item	Part number	Description	Quantity
1	53625-MPX	Under Hood MPX Harness	1
2	53627-MPX	MPX Lift Frame Harness	1
3	800080-MPX	MPX Control Module Box	1
4	53615-N	3/16" Mini Fuse Tap	1
5	HH-00141-029	10-32x3/4 bolt	4
6	HH-00540-100	10-32 Nut, Nylon Insert	4
7	53614-N	1/4" Fuse Tab	1
8	761354	1/4" Female Connector	1
9	HH-00293-028	5/16"-18 x1" HHCS	2
10	HH-00340-017	5/16"-18 Nut, Nylon Insert	2
11	HH-00341-003	5/16" Flat washer	2
12	53626-M	MPX Module Bracket	1
13	53476-B	18" Cable Plug Assembly	1
14	53477-B	90" Ground Cable (Black)	1
15	53478-B	90" Power Cable (Red)	1
16	FP17757	Solenoid	1
17	51335-56-M	Battery Cable, 56"	1
18	51335-22-M	Gauge Battery Cable, 22"	1
19	53608-N	Circuit Breaker	1
20	HH-00293-006	1/4"-20 x1" HHCS	1
21	HH-00294-001	1/4"-20 Hex Nut	1
22	HH-00457-006	1/4" Lock-washer	1
23	800084	Sealed Beam AXV Light Kit	1
24	800086	Dual Bulb Head Light Kit	1
25	800086-LED	LED Head Light Kit	1
26	53495-MPX	Handheld Controller For Wing Blade	1
27	-	MPX Light Adapter	1

Multiplexing electrical installation





When the plow is not attached to the truck, plug the end connectors to each other to avoid the corrosion (on both sides, plow and truck side).



Multiplexing Lighting System Procedure

Basic Lighting Transfer Overview:

To transfer the lights from the vehicles headlights to the plow lights, the Control Module Electrical System installed on your vehicle must see or read four things.

- 1.) The vehicles ignition is turned ON.
- 2.) The vehicles headlight switch is turned ON.
- 3.) The plow is plugged in (by the vehicles grill).

Note: Keep in mind that turning the vehicles ignition OFF, acts as a RESET for the lighting system.

Below is a set of three Conditions that may help to better explain the transfer of lights from vehicle to plow:

******When the vehicles ignition is turned OFF, the entire snowplow system is OFF. (Note: If this is not correct, see the plows installation instructions for proper plow installation).

Condition #1: The vehicle's ignition is turned ON, the plow is NOT attached (and NOT plugged in) and the plow control is OFF (or not plugged in). When turning ON the vehicles headlight switch, the vehicles headlights will turn ON.

Condition #2: The vehicles ignition is turned ON, the plow is attached (and plugged in) and the plow control is OFF (or not plugged in). When turning ON the vehicles headlight switch, the vehicles headlights will turn ON.

WARNING: If the plow was already raised when the ignition was turned ON, turning ON the vehicles headlight switch will only turn ON the vehicles headlights. It is NEVER recommended to drive a vehicle with a plow using only the vehicles headlights.

Once the vehicle ignition is ON and the vehicles headlights are ON, If you turn the plow control ON, the vehicles headlights will turn OFF (transfer) and the plow lights will turn ON.

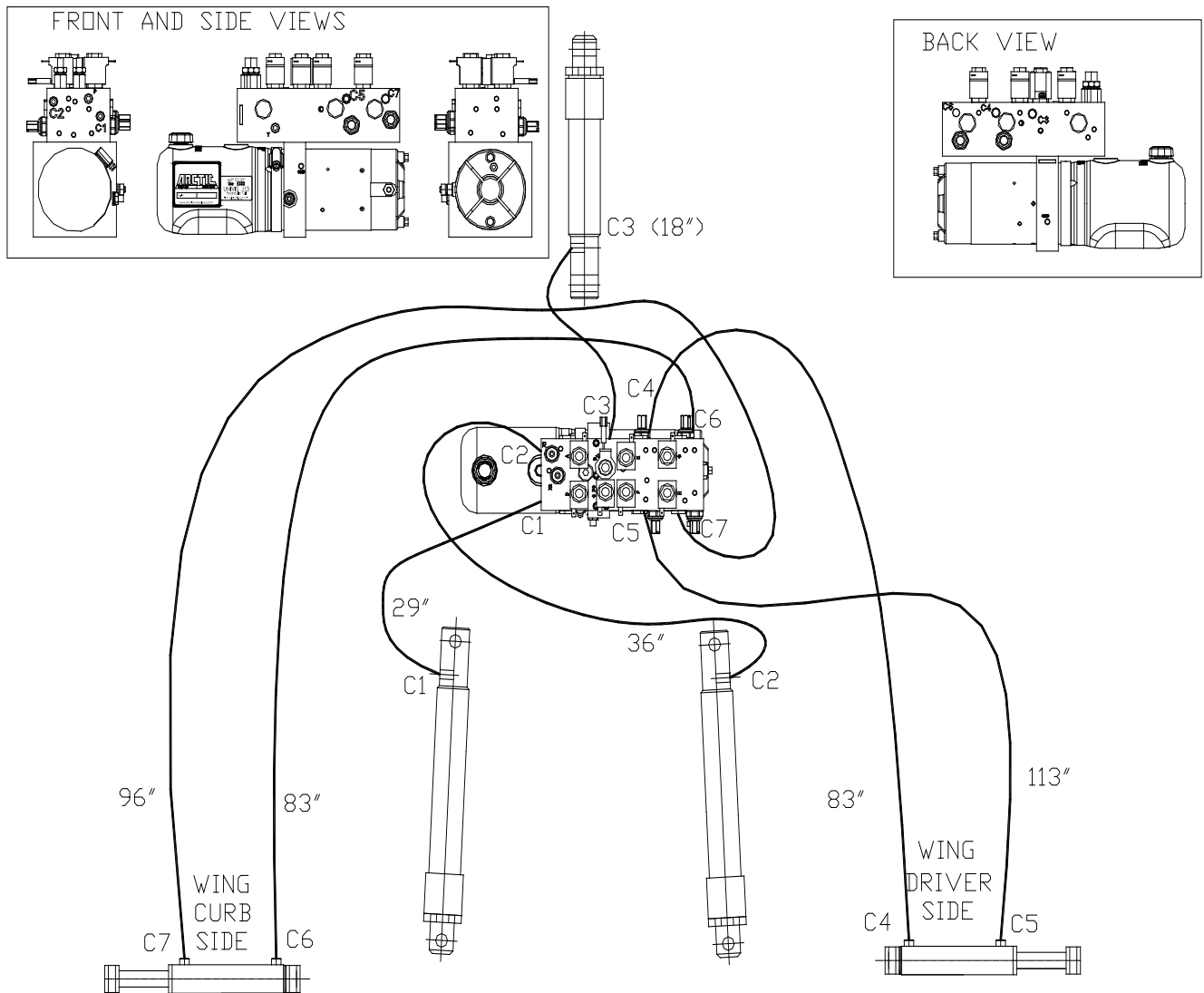
Note: From this point on, the plow control can be turned OFF (Recommended while driving on road/Not plowing) and ON as needed by the operator and the plow lights will remain ON.

Turning OFF the ignition will reset the lighting system back to ******.

Condition #3: The vehicles ignition is turned ON, the plow is NOT attached (and NOT plugged in) and the plow control is plugged in and ON. When turning ON the vehicles headlight switch, the vehicles headlights will turn ON.

Note: When the plow is not attached to the truck, for safety, the control should be turned OFF or unplugged. This locks the lights to vehicle lights only. During this condition (ignition ON, plow control ON), plugging in the plow (attached or not) will transfer the lights from the vehicle to the plow lights. Then, unplugging the plow will transfer the lights from the plow to the vehicle lights.

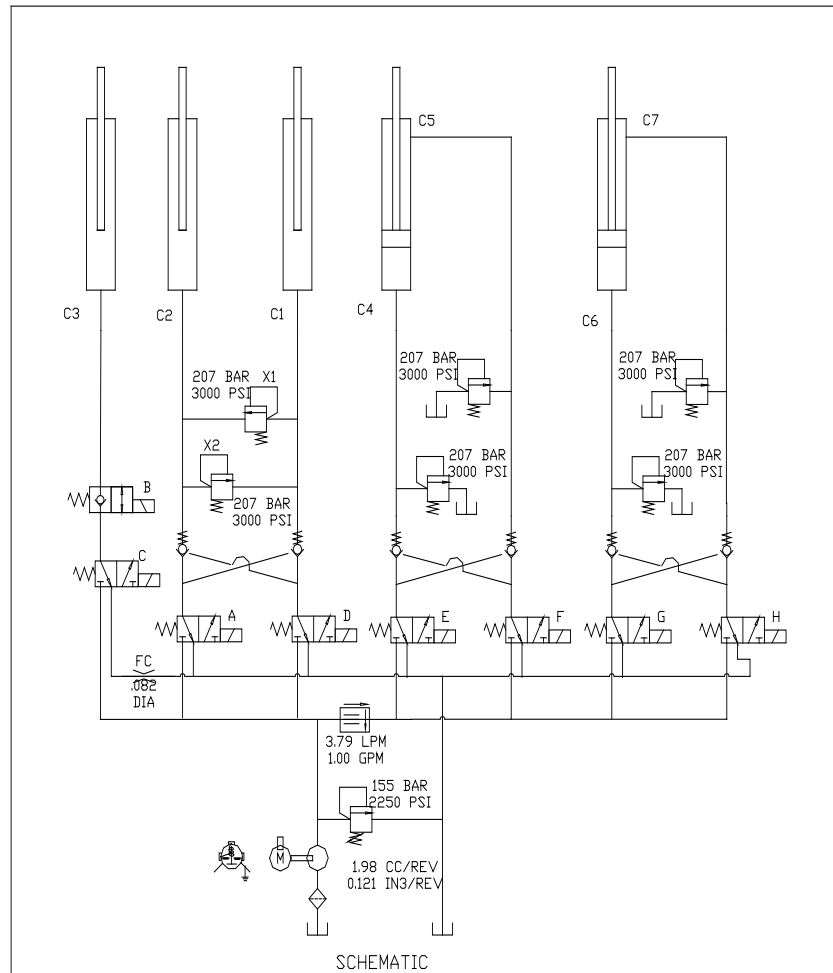
Hydraulic hoses installation



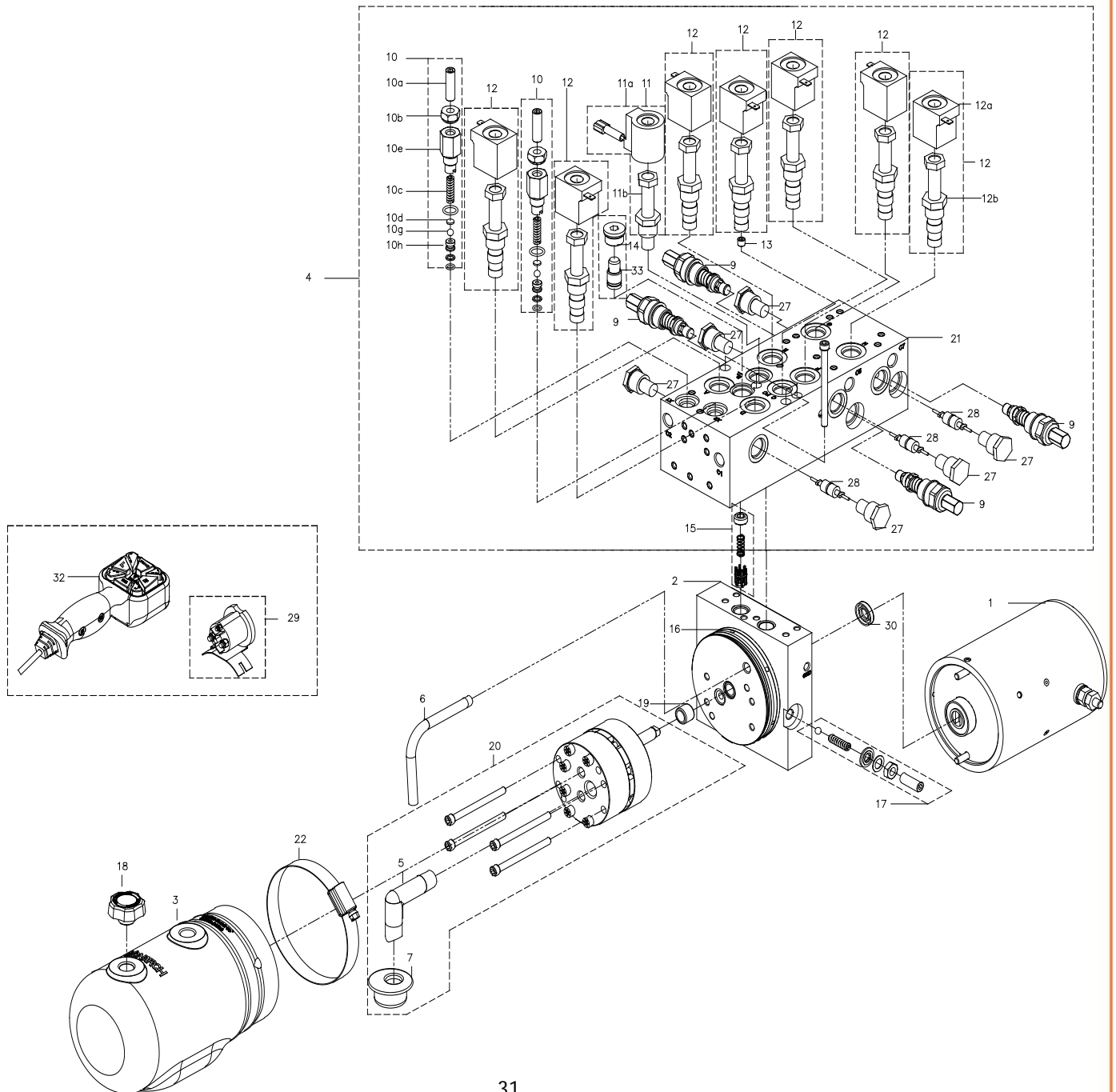
M3593-WING PUMP KIT (NO HARNESS)

Item	Part number	Description	Quantity
1	M3593-WING	Power Unit For Wing Plow	1
2	53529-C	Wing Blade Pump Plate Ass	1
3	52429-C	Arctic Power Unit Cover	1
4	53538-N	83" Hose	2
5	53539-N	96" Hose	1
6	53540-N	113" Hose	1
7	51002-M	18" Hose	1
8	51904-M	29" Hose Assembly (St-90)	1
9	51905-M	36" Hose Assembly (St-90)	1
10	53476-B	18" Cable Plug Assembly	1
11	53477-B	90" Ground Cable (Black)	1
12	53478-B	90" Power Cable (Red)	1
13	CS200-06.00-NRS	2" x 6" Lift Cylinder	1
14	53494-M-BB	Pump Kit Bolt Bag	1
15	53608-N	Circuit Breaker	1
16	51335-22-M	4 Gauge Battery Cable, 22	1
17	51335-56-M	4 Gauge Battery Cable, 56	1
18	HH-00794-003	1/4" Pipe To Pipe Fitting	4
19	53536-N	90 Deg Extended Swivel Elbow	3
20	HH-00790-002	90 Deg Swivel Elbow	3
21	52436-N	Grommet 1/4"X1.3/4x2.1/2	2
22	52435-N	Grommet 3/16x1.1/2x2.1/8	1
23	52427-N	Red Terminal Protector	1
24	53560-A	Dummy Plug (Power&Ground)	1
25	490056-01	1/2 Oz Tube Dielectric Grease	1
26	53147-N	3/8 Star Lock Washer	2
27	HH-00293-049	3/8-16x1 HHCS	2
28	HH-00972-029	5/16-24x1.1/4 HHCS	4
29	HH-00341-003	5/16 Flatwasher	8
30	HH-00540-007	5/16-24 Nylon Insert	4
31	HH-00455-007	#8x3/4 Sq. Dr. Pan	4

Hydraulic Schematic



ELEC DEVICE	FUNCTION									
	RAISE	LOWER	ANGLE RIGHT	ANGLE LEFT	WINGS OUT	WINGS IN	RIGHT OUT	RIGHT IN	LEFT OUT	LEFT IN
MOTOR	ON		ON	ON	ON	ON	ON	ON	ON	ON
A - white b/s			ON							
B-blue		ON								
C-green	ON									
D-yellow				ON						
E-red					ON				ON	
F-orange						ON				ON
G-gray					ON		ON			
H-purple						ON		ON		



POWER UNIT M3593-WING PARTS LIST

Item	Part number	Description	Quantity
1	FP8111-I	Motor	1
2	FP18405	Pump base assembly	1
3	FP6102	Reservoir	1
4	FP22003	Manifold assembly (incl. all valves)	1
5	FP1209	Suction tube	1
6	FP13058	Return tube	1
7	FP1134	Suction filter	1
8	FP0118	O-ring, 5/8 x 3/4 x 1/16 -016	2
9	53581-N	Relief Valve	4
10	FP13023	X over valve assembly (XA1, XA2, XD1, XD2)	2
10a	FP7899	Screw	1
10b	FP0386	Sealing nut	1
10c	FP0147	Spring	1
10d	FP1288	Plate	1
10e	FP0379	Housing	1
10g	FP0012	Ball	1
10h	FP0378	Seat	1
11	FP0490-D	Valve, #8, 2W / 2P, NC poppet (C)	1
11a	FP10861-D	Coil #8, 2W / 2P 12V	1
11b	FP10907-D	Valve cartridge, #8, NC poppet	1
12	FP7249-D	Valve, #8, 3W / 2P, spade terminal (A1, D1, A2, D2, C)	5
12a	FP18835-D	Coil, 12 VDC, #8, with spade terminal	1
12b	FP0679-D	Valve cartridge, #8 spool, 3W / 2P	1
13	FP2361	Orifice	1
14	FP3274	Plug, SAE 3/4"-16	1
15	FP7526	Check valve kit	1
16	FP2352	O-ring, 3 3/4 x 4 x 1/8, -240	1
17	FP7527	Relief valve, (flat washer FPN0575/seal washer FP3874)	1
18	FPN0571	Breather	1
19	FP7985	Needle Bearing	1
20	FP12171-250-SA	Pump assembly kit	1
21	FP22002	Manifold only	1
22	FP7900	Clamp, (clamp up to 80inlb)	1

POWER UNIT M3593-WING PARTS LIST

Item	Part number	Description	Quantity
23	FP7837	Screw, SHCS, ¼ x 3 1/4"	4
24	53469-B	Harness, valve section	1
25	53470-B	Underhood intermediate harness	1
26	53487-B	Incab intermediate harness	1
27	FP7217	Check Valve	6
28	FP7218	Piston	3
29	FP17757	Solenoid, switch	1
30	FP2159	Pump shaft seal	1
31	FP2318	Motor bearing	1
32	53495	Handheld Controller	1
33	FP1723-1.0	Flow Control	1

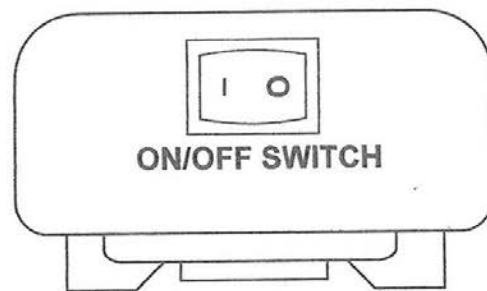
Handheld control

1. Turn the ON/OFF switch on the control to the ON position. The control keypad will glow green, indicating the control is on.

NOTE: The ON/OFF switch can be used as an emergency stop when required.

2. Press the DOWN button for 1.3 seconds to engage the FLOAT mode. The FLOAT indicator light, located in the center of the keypad (logo), will change from green to red. To cancel the FLOAT mode, momentarily press the UP button.

FLOAT mode will automatically cancel after 20 minutes, and the FLOAT indicator light will turn back to green. To restart FLOAT mode, repeat step 2.



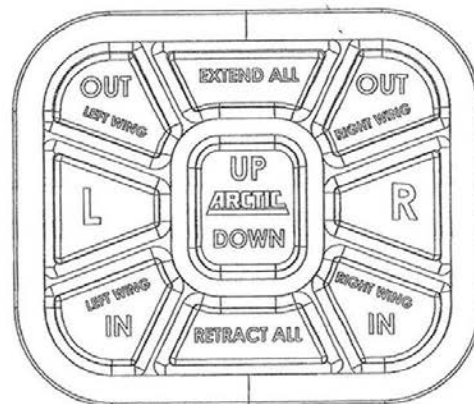
(LOCATED ON TOP OF HANDHELD CONTROL)

Blade Operation Time Outs

All control functions automatically time out (shut off) after a period of time. This helps reduce wear on the pump motor and prevent unnecessary battery drain. All functions will time out after 6 to 8 seconds.

Automatic Shutdown

After being idle for approx. 22 minutes, the control will automatically turn off and the indicator light located at the center of the keypad (logo) will blink from red to green. To restart the control, turn the control OFF (ON/OFF switch) and then back ON.



KEYPAD

Troubleshooting flow chart for power unit M3593-WING

Safety and warnings

Servicing the snowplow (hydraulic power system, hoses, hydraulic cylinders, controllers, wiring harnesses, lights, blade frame, blade moldboard, A-frame, quadrant, lift frame and vehicle undercarriage) without special tools and knowledge could result in personal injury. See an authorized Arctic dealer for service.

- Fluid under pressure can pierce the skin and enter the bloodstream resulting in serious injury or death.
- Eye protection and protective clothing must be worn when working on any portion of the snowplow.
- Remove any jewellery (rings, bracelets, watches, necklaces) that could conduct electricity while working with electrical system.
- Lifted blade should be securely propped or immobilized while working on it or any other suspended part so it cannot fall.
- Do not operate blade when anyone is within a 10 foot radius of it.
- Use of any fluid other than J13 will void warranty

Tips

- Pump shaft can be turned freely (smoothly) using two fingers. If it can't be turned replace pump. Proper pump rotation is clockwise looking from the motor end.
- Use a screwdriver to check magnetism of solenoid coils. Place screwdriver on the nut securing the coil and have the switch operated. Strong magnetic attraction should be felt.
- Measure pump pressure at an angle hose (at full angle) it has to be 2250 psi (assuming that cross over relief valve setting is 3000 psi, if X-over relief valve setting is less than relief valve setting pressure gage will read lowest reading). The most accurate reading of system pressure is reading pressure on lift cylinder. When testing or making adjustments on the relief valve the system must be "dead headed" (cylinder at full stroke or in a position where cylinder movement is zero).
- AMP draw of motor should be measured at maximum raise or maximum angle when motor is running at 2250 psi.
- Use volt meter or test light to test for power in a harness or continuity in a switch. A test light is simply a light bulb which has one end connected by a wire to an alligator clip and the other end connected to a metal probe. It is used to check the electrical circuit when the battery is connected to the system. The alligator clip is grounded and the light glows when the probe comes in contact with a "live" electrical component.

-Do not screw cartridge valves into cavity too fast; use a back and forth motion and have O-rings well lubricated.

-Clean all parts thoroughly before assembly and lubricate with clean oil.

-Do not use Teflon tape on hydraulic connections as it can easily jam the valves and plug the filters in the system, use pipe sealant. Never apply pipe sealant at the end of fitting, always 2- 3 threads back.

-X-over pressure could be set only for angling cylinders (pressure can't be set on crossovers for wing blade) using hand (hydraulic) pump. Example: If you want to set the pressure at x-over X1 insert hand pump hose in the C1 port together with pressure gauge. Loosen the jam nut and turn adjusting screw clockwise a turn or two and watch the gauge; if it goes up, continue to turn the screw until the required setting is reached. Retighten the jam nut. To set X-over X2 repeat the same steps as setting X1.

To adjust relief valve:

-Loosen jam nut counter-clockwise. Turn screw clockwise to increase pressure or turn screw counter-clockwise to decrease pressure. Tighten jam nut clockwise to 50in.lb. torque. Check system pressure after jam nut is tight. Readjust pressure if screw is moved during tightening of jam nut.

Specification:

-Max Amp Draw 230 AMP (AMP draw of motor should be measured at maximum raise or maximum angle when motor is running at pressure setting at 2250 psi).

Note: Do not operate motor continuously for more than 30 sec.

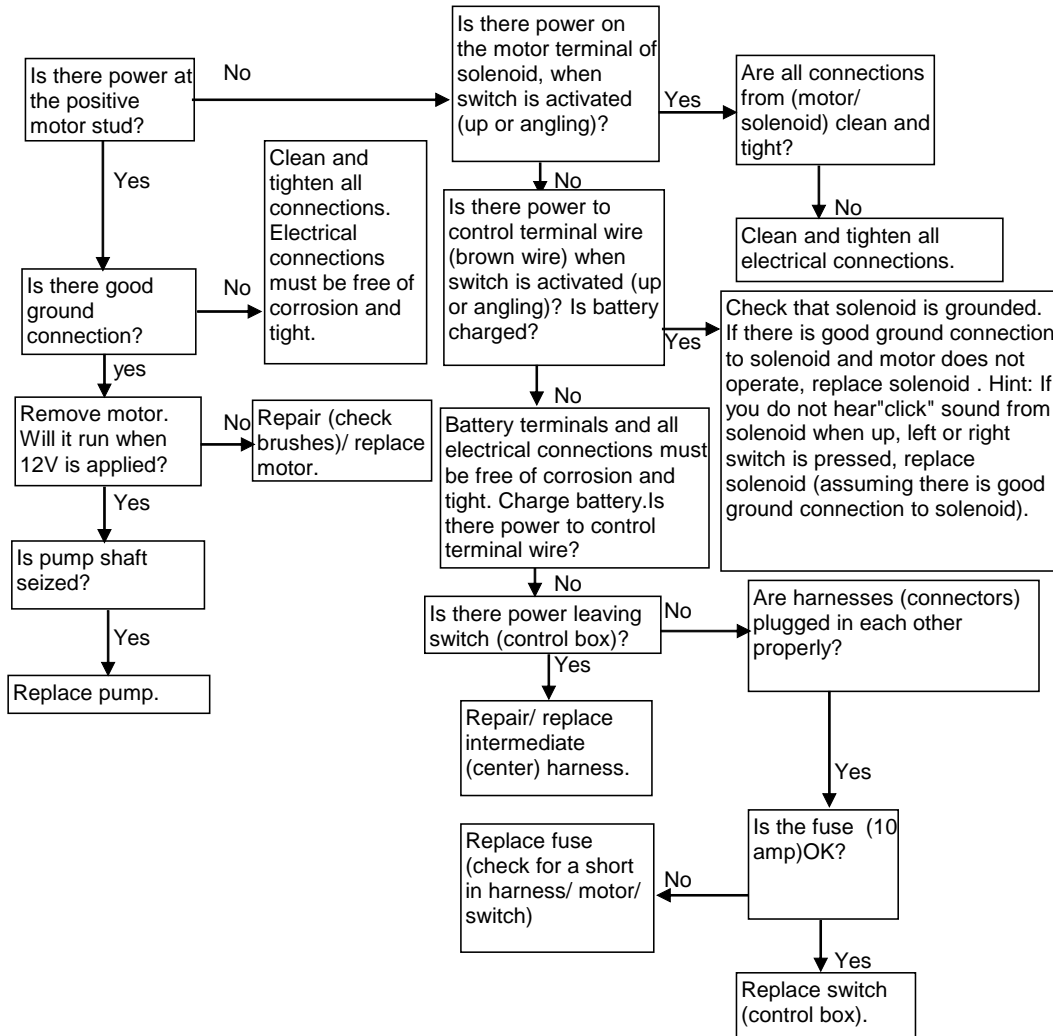
-Relief valve setting 2250 psi.

-X-over relief valve setting 3000 psi.

Note: Quick couplers are an optional item. If unit is not equipped with quick couplers, disregard troubleshooting steps involving them.

Troubleshooting for one piece harness is below. For multiplexing troubleshooting contact Arctic Equipment or the Arctic Dealer.

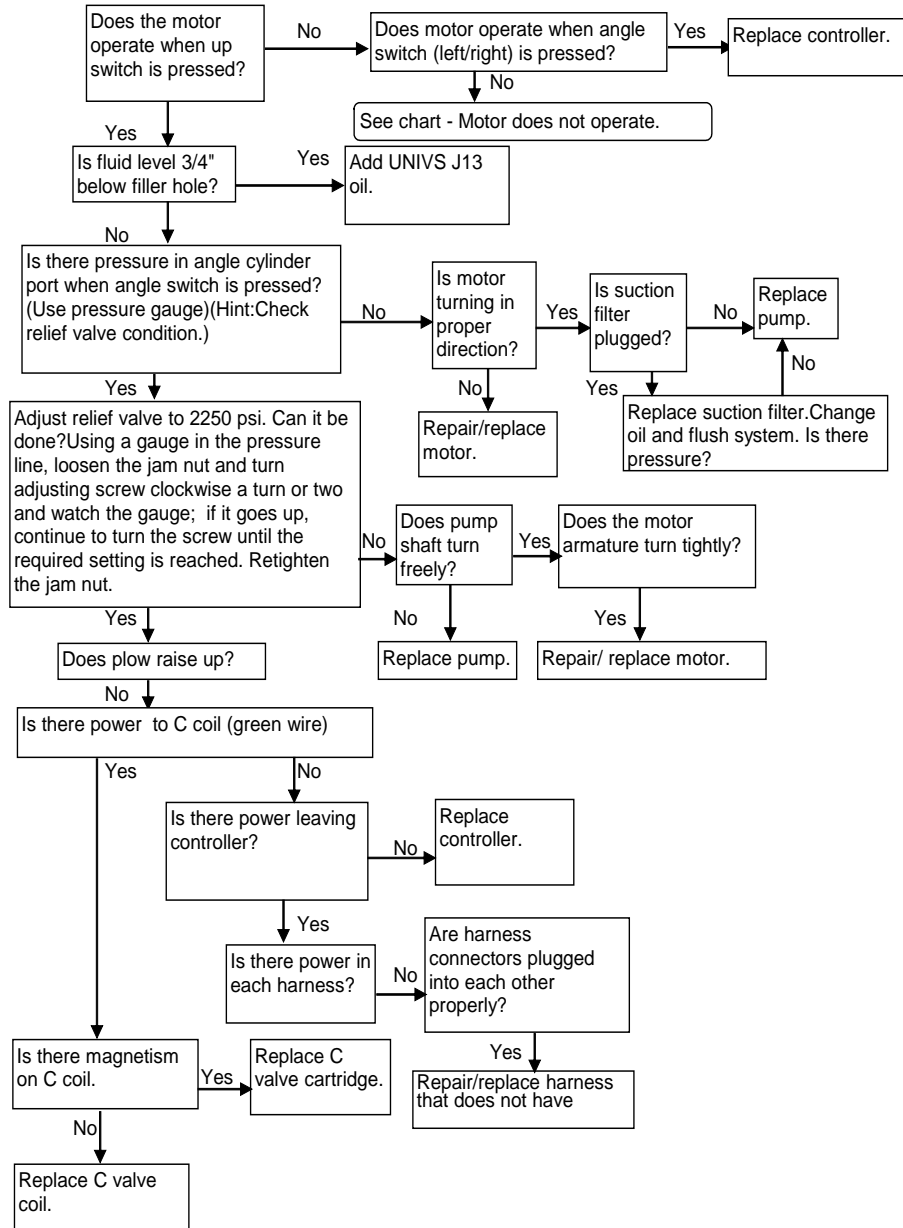
MOTOR DOES NOT OPERATE M3593-WING



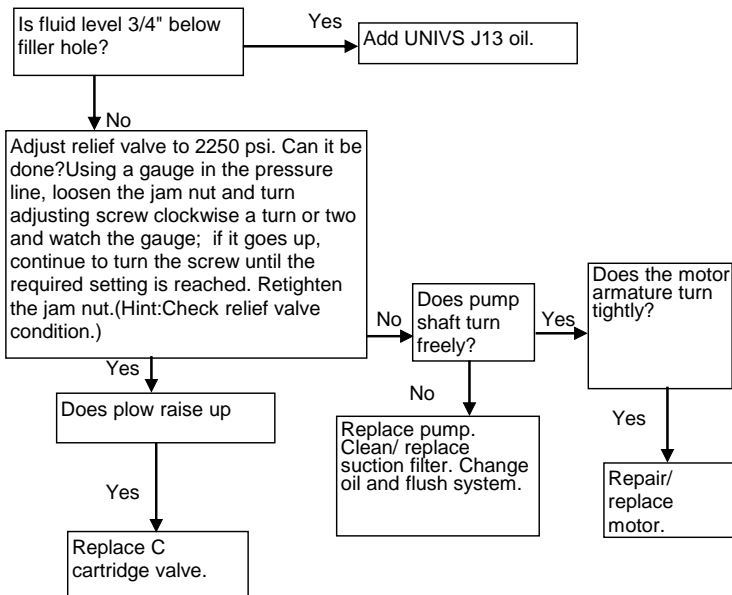
MOTOR OPERATES CONTINUOUSLY M3593

If motor operates continuously, change solenoid.

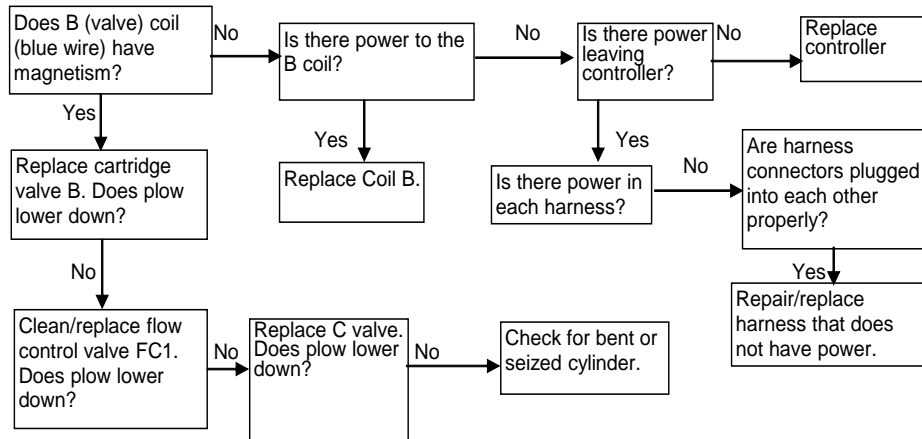
SNOW PLOW DOES NOT RAISE M3593-WING



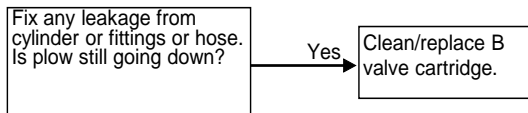
SNOW PLOW RAISES VERY SLOWLY M3593-WING



SNOW PLOW WILL NOT LOWER M3593-WING



SNOW PLOW LEAKS DOWN M3593-WING



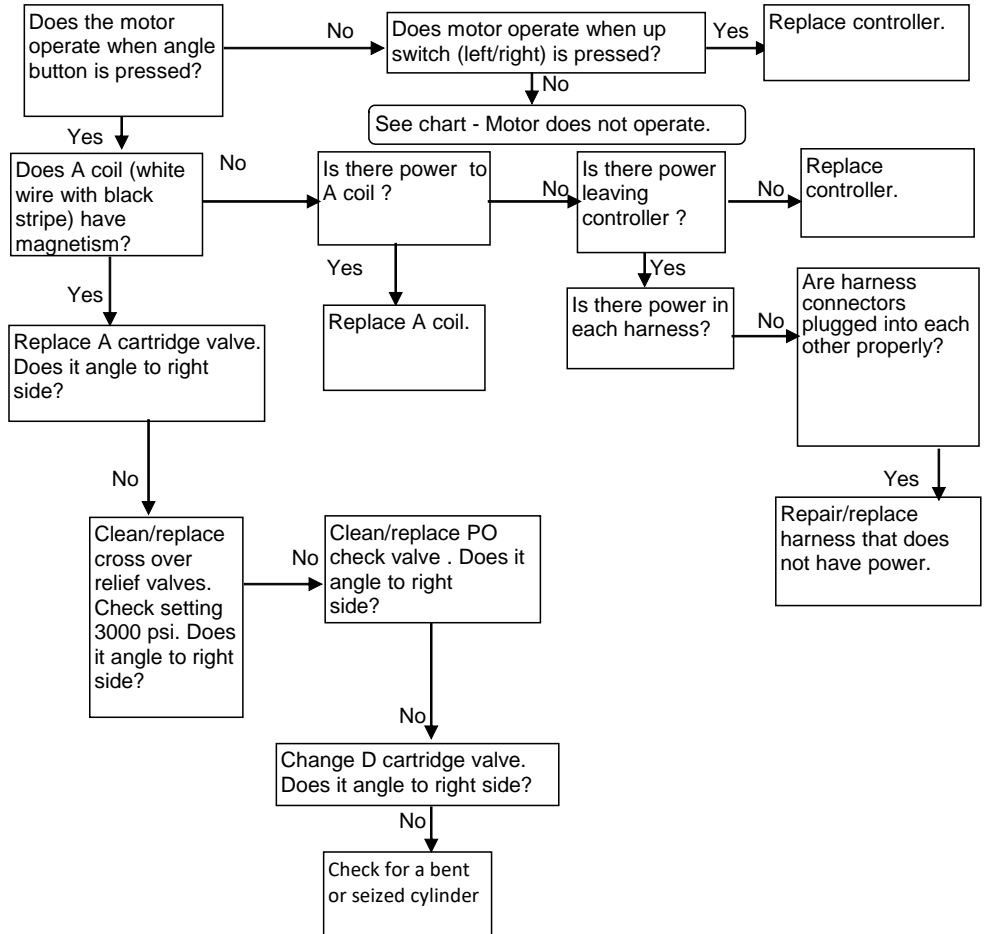
SNOW PLOW ANGLES BEFORE GOING UP WHEN UP BUTTON IS PRESSED M3593-WING

If snow plow angles left before going up change D valve and if snow plow angles to right side change A valve.

SNOW PLOW WHEN FULLY ANGLED GOES UP (WHEN ANGLE BUTTON IS PRESSED) M3593-WING

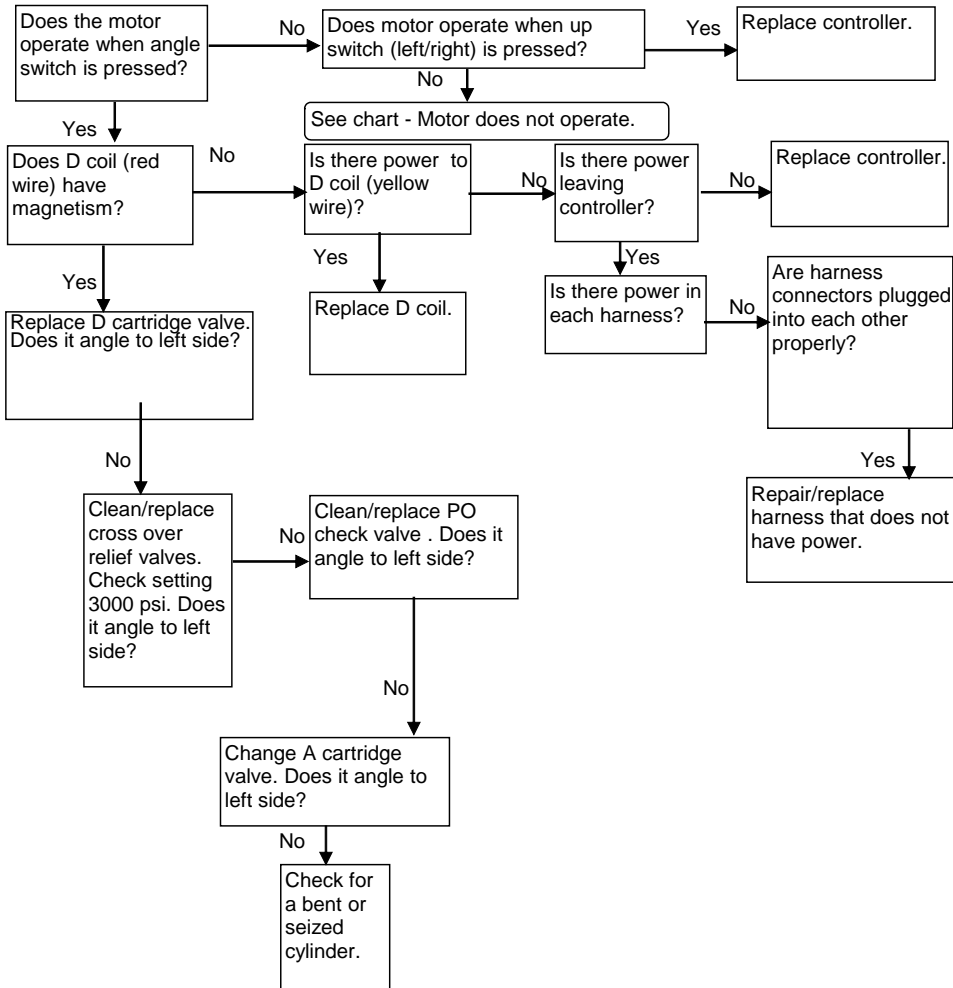
Change C Valve cartridge.

SNOW PLOW DOES NOT ANGLE TO RIGHT SIDE M3593-WING



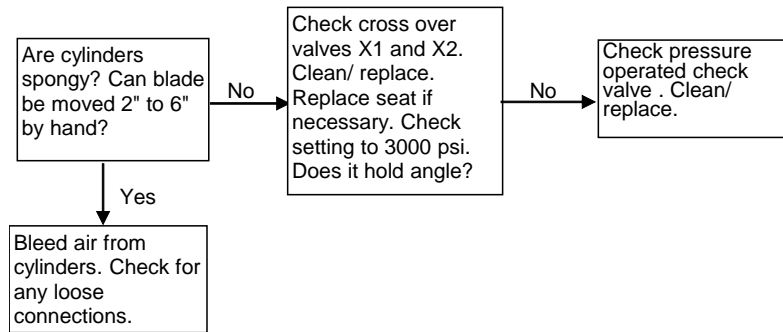
Note: Before start troubleshooting check that plow moves up and down. If plow does not move up and down see "plow does not raise".

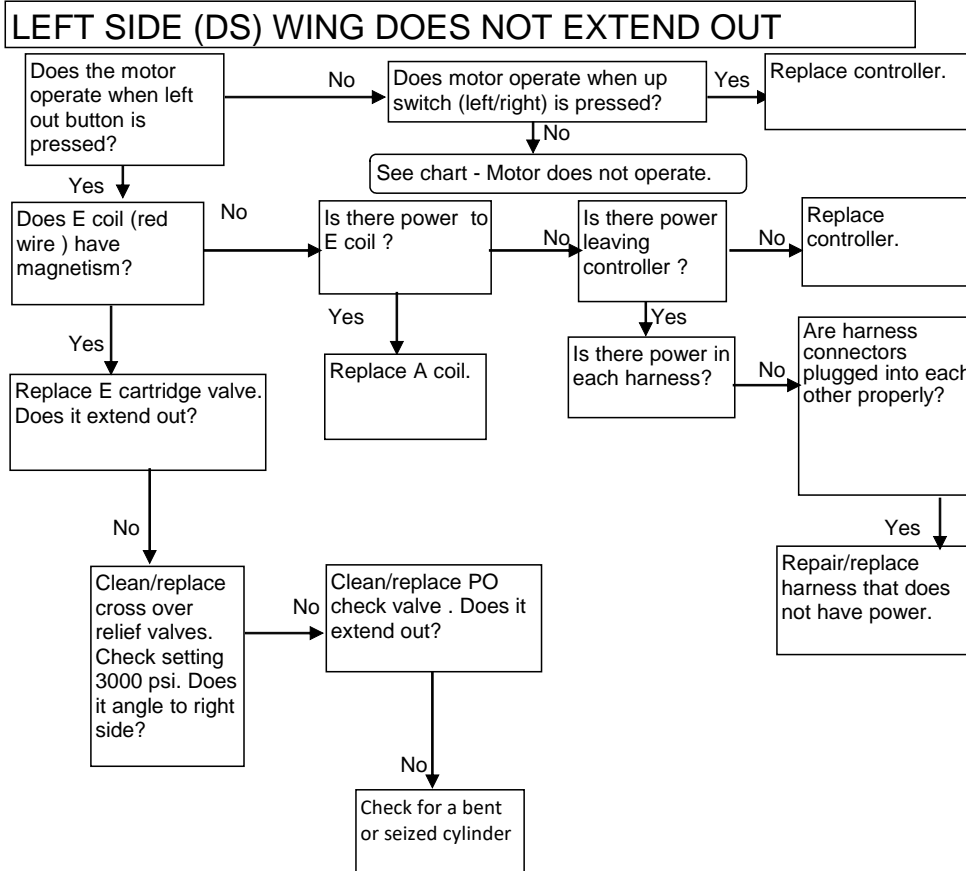
SNOW PLOW DOES NOT ANGLE TO LEFT SIDE M3593-WING



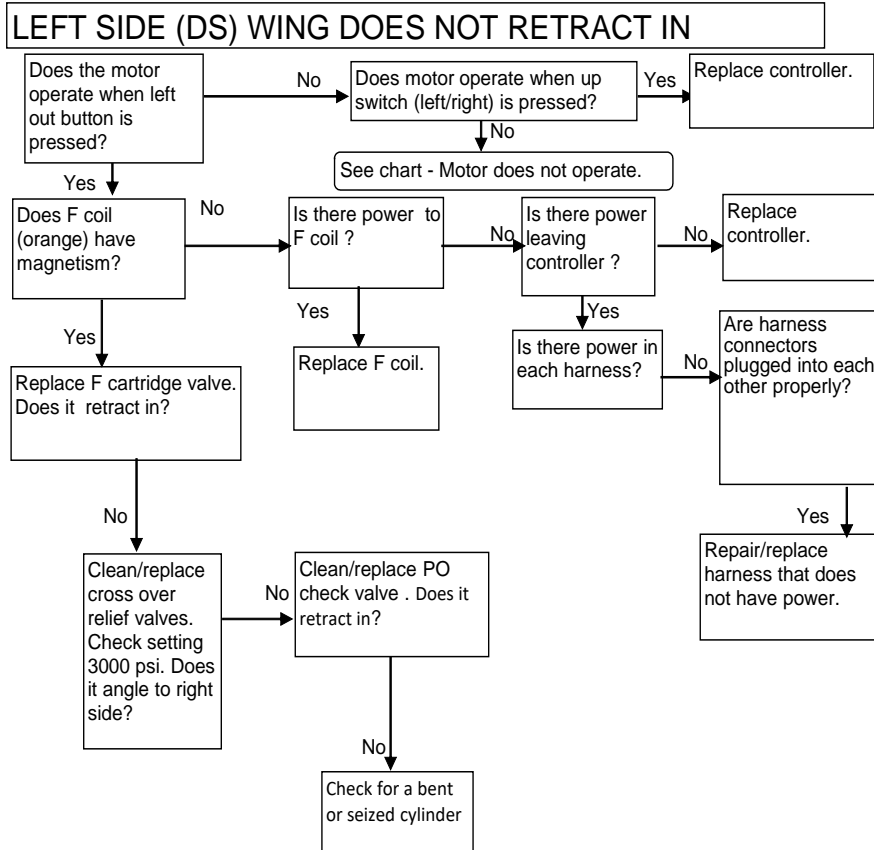
Note: Before start troubleshooting check that plow moves up and down. If plow does not move up and down see "plow does not raise".

PLOW DOES NOT HOLD ANGLE M3593-WING



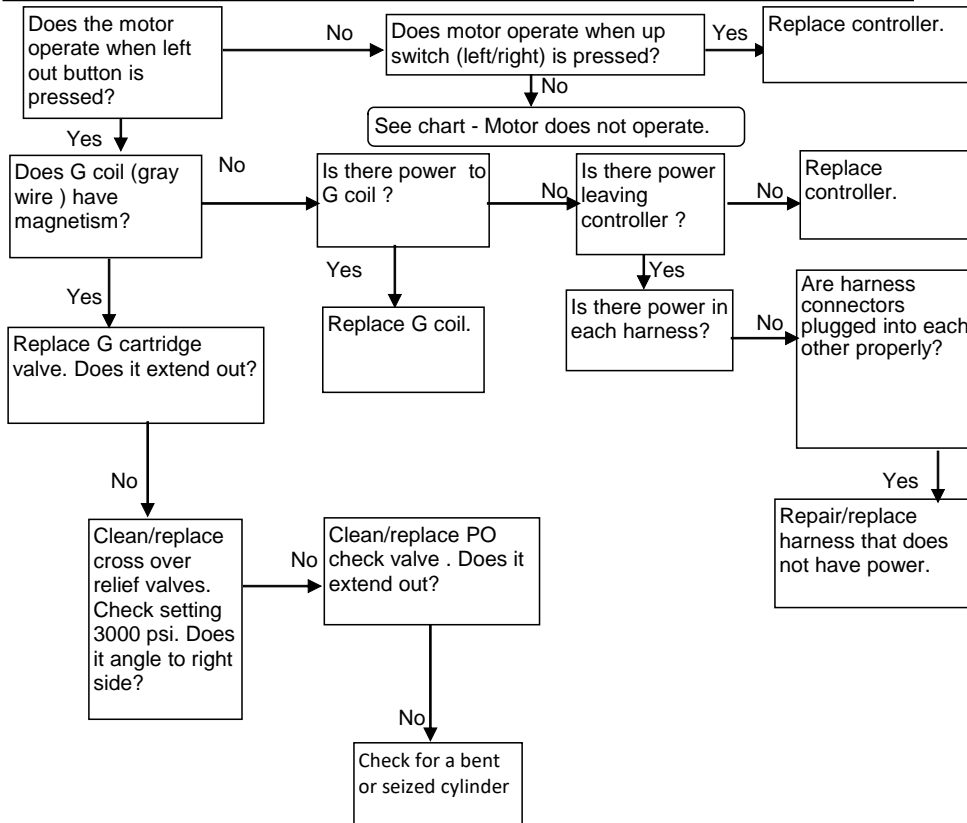


Note: Before start troubleshooting check that plow moves up and down. If plow does not move up and down see "plow does not raise".

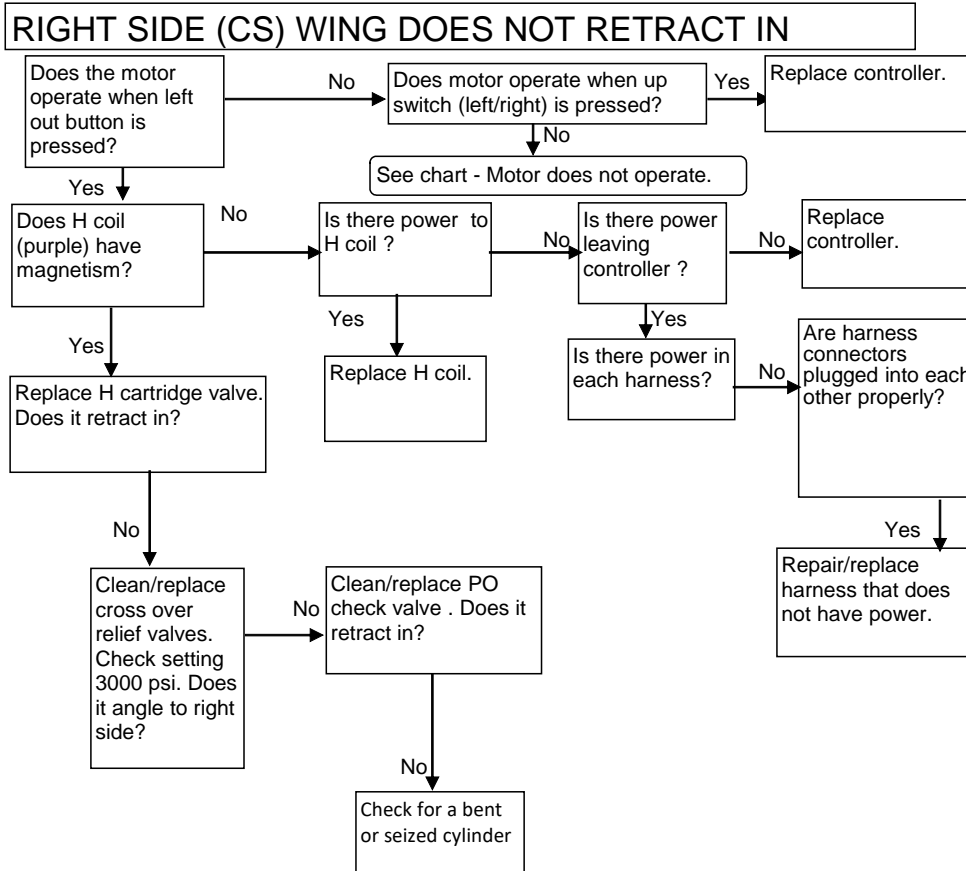


Note: Before start troubleshooting check that plow moves up and down. If plow does not move up and down see "plow does not raise".

RIGHT SIDE (CS) WING DOES NOT EXTEND OUT

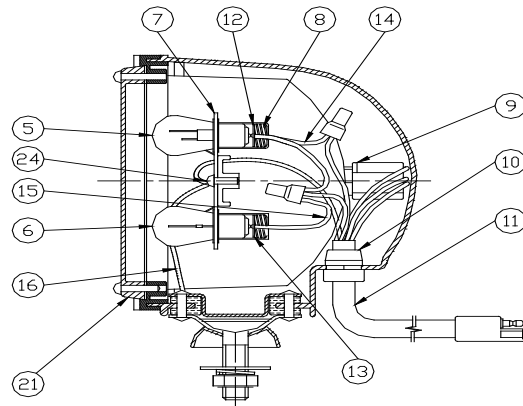
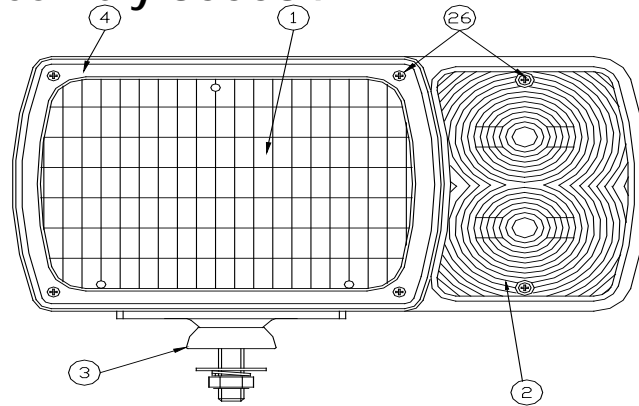


Note: Before start troubleshooting check that plow moves up and down. If plow does not move up and down see "plow does not raise".



Note: Before start troubleshooting check that plow moves up and down. If plow does not move up and down see "plow does not raise".

Headlight assembly 800084



RECTANGULAR HEADLIGHT KIT 800084

Item	Part Number	Description	Quantity
1	465091XV	Sealed beam	2
2	732467	Amber lens	2
3	739006	Mounting swivel assembly	2
4	298110-36	Sealed beam retaining ring	2
5	460028	Double contact bulb	2
6	460027	Single contact bulb	2
7	280392-00	Socket and bracket assembly	2
8	535003	Spring	4
9	420943	Sealed beam connector	2
10	190055	Strain relief bushing	2
11	421061-2	Light Harness	2
12	320185-01	Double contact disc	2
13	320104-01	Single contact disc	2
14	520014-09	Brown wire 7"	2
15	520013-11	Red wire 7"	4
16	520019-84	Black wire ground	2
19	251098-00	Housing and grommet assembly LH	1
20	251099-01	Housing and grommet assembly RH	1
21	251104-66	Bezel	2
22	410197	Gasket for amber lens	2
23	410198	Gasket for seal beam	2
24	124002-01	Screw, #8 x 5/8", pan head	2
25	124090-02	Screw, #8 x 1", pan head	12
26	124713-00	Screw, #8 x 1 1/4", pan head	12

Headlight assembly 800086



RECTANGULAR HEADLIGHT KIT 800086			
Item	Part Number	Description	Quantity
1	800073-01-D	Low Beam Halogen Bulb H7 55W	1
2	800073-02-D	High Beam Halogen Bulb H1 55W	1
3	800074	Amber Signal Bulb	1
4	421061-2	Harness, light section	1

Headlight assembly 800086-LED



RECTANGULAR HEADLIGHT KIT 800086-LED			
Item	Part Number	Description	Quantity
1	800086-LED-01	Driver Side Headlight	1
2	800086-LED-02	Curb Side Headlight	1
3	800074	Amber Signal Bulb	1
4	421061-2	Harness, light section	1

Snow Plow Maintenance

In order for the customer to be eligible for warranty every year, the snowplow, inclusive of all components, must be returned to an authorized Arctic dealer every spring for preventative maintenance. Warranty work must be performed by an authorized Arctic dealer. Failure to do so will nullify any future warranty claims.

Warning

Inspect the snowplow components and bolts for wear or damage before mounting or removing the snowplow and before travelling and be sure that the plow is properly attached before moving the vehicle.

-Servicing the snowplow (hydraulic power system, hoses, hydraulic cylinders, controllers, wiring harnesses, lights, blade frame, blade moldboard, A-frame, quadrant, lift frame and vehicle undercarriage) without special tools and knowledge could result in personal injury. See an authorized Arctic dealer for service.

- Make sure you know all obstructions (bumper stops, curbs, fire hydrants etc.) before it snows, because it will be very hard to see these obstructions after it snows. If necessary mark them with flags to avoid possible damage to your plow or vehicle.

- Do not let snow accumulate, always plow with the storm.

- Always wear seatbelts when plowing snow.

- Always lower the blade when the vehicle is not in use.

-Always wear eye protection and protective clothing when working around hydraulic systems.

-Remove jewellery and objects that might conduct electricity while working on power units.

-Fluid under pressure can pierce the skin and enter the bloodstream causing death or serious injury.

- When adjusting the relief valve be sure to use a pressure gauge. Failure to accurately set the relief valve can cause failure resulting in damage to the equipment or cause bodily harm.

Inspect on a regular basis

After every 18 hours of plowing perform the following inspection:

-Inspect all fasteners, mounting bolts, hydraulic and electrical connections for tightness (see recommended bolt torque located in this manual).

-Inspect the plow assembly (the blade, A-frame, lift frame, spreader bar and mounting kit) for any damage. (Replace part as necessary)

Post season maintenance

-Inspect the plow assembly (the blade, A-frame, lift frame, spreader bar and mounting kit, all fasteners, pins, retainers, nuts and bolts for tightness) for any damage (cracks, abnormal wear, etc.) and repair or replace part as necessary. Tighten all undercarriage bolts. Apply grease to the centre pin (if applicable).

-Check all electrical connections, control harness and power/ground cable connectors for corrosion and repair or replace part as necessary. Disconnect all electrical plugs and coat each connection with dielectric grease. Install all dummy plugs provided.

-Check power unit and hydraulic system (check hydraulic hoses for cracks and leaks, check for any leaks from the system (fittings)).

-Drain and flush hydraulic system and refill with UNIVIS HVI 13 hydraulic fluid. Fill up power unit with new oil. Lift cylinder rod must be all the way down (put control box switch in float position and push cylinder rod down by hands - cylinder must be all the way down). Jog up and down switch for lift cylinder. Also jog left and right for angling cylinders.

-Refill power unit so that oil level is $\frac{3}{4}$ " from the top of the reservoir. Clean up any spilled oil and check all functions several times making sure there is not excessive foaming in the reservoir. Compress the lift cylinder and double check the oil level. Check for leaks at all fittings and reinstall filler plug.

-Collapse lift cylinder. Cover exposed rod of the lift cylinder and angle cylinders with water resistant grease.

-Clean and paint the blade assembly as needed.

Preseason check

Before the snow season check your equipment to make sure it is in working condition

-Check power unit, control switch, lights for proper operation.

-Check all fasteners, pins, retainers, nuts and bolts for tightness. Apply grease to the centre pin (if applicable).

-Check all electrical connections, control harness and power/ground cable connectors for corrosion. Coat all electrical connections with dielectric grease (apply dielectric grease to all electrical connections at least once per month during the plow season).

-Inspect and test your battery.

-Check the ballast. The loaded vehicle MUST NOT exceed vehicle gross vehicle weight ratings (GAWR), front gross axle weight rating (FGAWR) or rear gross axle weight rating (RGAWR).

Clearing Driveways and Parking Lots

Clearing Driveways (Residential)

- Straighten and raise the blade and drive up to the garage. Drop the blade and back drag the snow away from the garage at least one vehicle length. Repeat if necessary.
- Back the vehicle to the garage and push the remaining snow from the driveway, either to the side (blade angled) or into the designated spot (blade straight).

Clearing Parking Lots

- Clear the areas in front of the buildings first. Back drag if necessary and work away from the buildings toward the outer edges of the lot.
- Plow a single pass down the centre in the long direction.
- Angle the plow towards the long sides until the area is cleared.
- If the snow is too deep, clear only the main traffic areas of snow for later handling by heavy equipment.

NOTE: All Arctic snowplows have a stop built in, to prevent the blade from contacting the bottom of the bumper. If the blade is pushed too high on the snow bank, the stop will bind and cause the truck's weight to be supported by the plow. This can cause damage to the A-frame, cylinders, and mounting kit, as well as the trucks bumper and frame. Please "Don't Stockpile". Leave that for the loaders.

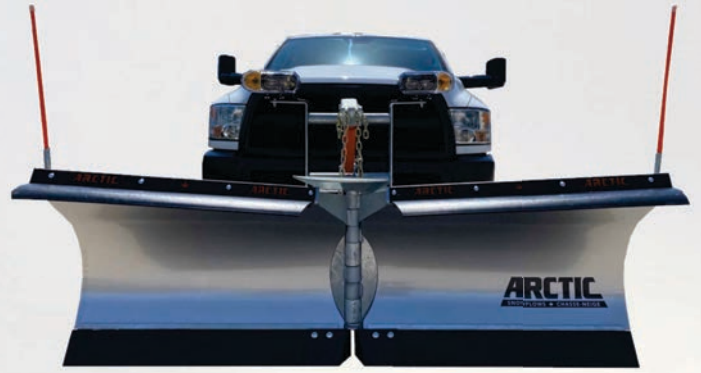
Warning

Excessive stacking of snow causes undue stress to the snowplow and the vehicle. It may result in the failure of the plow components and it can cause damage to the vehicle

ARCTIC

SNOWPLOWS ❄️ CHASSE-NEIGE





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