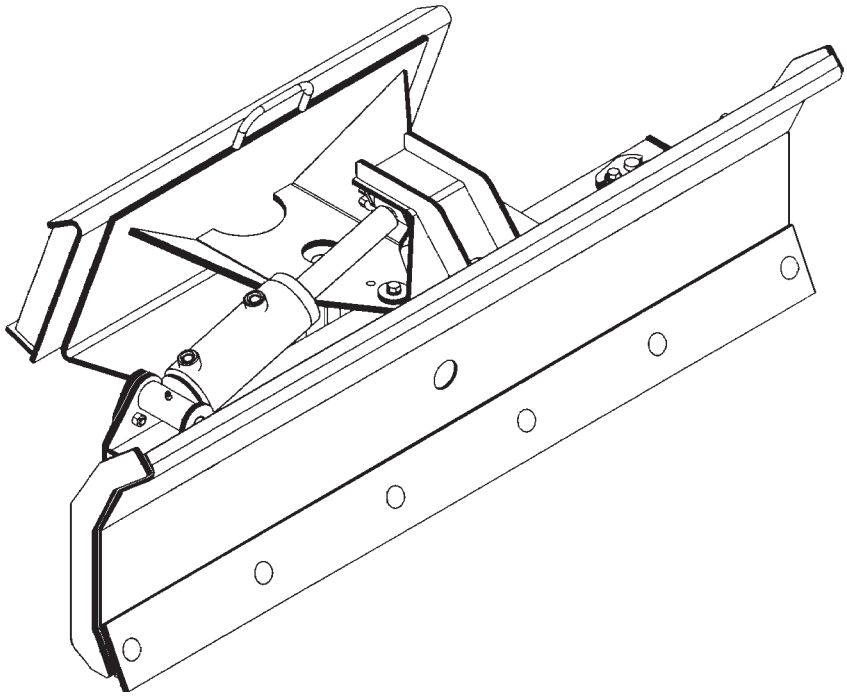
BRADCO

PALADIN LIGHT CONSTRUCTION GROUP
BRADCO
FFC
HARLEY
McMILLEN
SWEEPSTER
The Power of Combined Excellence

OPERATOR'S AND PARTS MANUAL

ATP46 & ATP67 HYDRAULIC ANGLE AND TILT DOZER BLADE



SERIAL NUMBER: _____

MODEL NUMBER: _____

Manual Number: OM651
Part Number: 75551
Rev. 2

800-456-7100 I www.paladinlcg.com 503 Gay Street, Delhi, IA 52223, United States of America

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TO THE OWNER

GENERAL COMMENTS

Congratulations on the purchase of your new BRADCO product! This product was carefully designed and manufactured to give you years of dependable service. Only minor maintenance (such as cleaning and lubricating) is required to keep it in top working condition. Be sure to observe all safety precautions and maintenance procedures, as described in this manual.

ABOUT THIS MANUAL

This manual has been designed to help you do a better, safer job. Read this manual carefully and become familiar with its contents. **Remember, never let anyone operate this unit without reading the "Safety Precautions" and "Operating Instructions" sections of this manual. (See Sections B and G respectively.)**

Unless noted otherwise, right and left sides are determined from the position of the operator when behind the product facing forward.

SAFETY ALERT SYMBOL

This is the "Safety Alert Symbol" used by this industry. This symbol is used to warn of possible injury. Be sure to read all warnings carefully. They are included for your safety and for the safety of others working with you.

SERVICE

When servicing your product, remember to use only manufacturer replacement parts. Substitute parts may not meet the standards required for safe, dependable operation.

To facilitate parts ordering, record the model and serial number of your unit in the space provided on this page. This information may be obtained from the identification plate located on the product.

MODEL_____
SERIAL NUMBER_____
DATE PURCHASED_____

The parts department needs this information to insure that you receive the correct parts for your specific model.

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SAFETY PRECAUTIONS

TAKE NOTE! THIS SAFETY ALERT SYMBOL FOUND THROUGHOUT THIS MANUAL IS USED TO CALL YOUR ATTENTION TO INSTRUCTIONS INVOLVING YOUR PERSONAL SAFETY OR OTHERS. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN INJURY OR DEATH.

THIS SYMBOL MEANS:

ATTENTION!

BECOME ALERT!

YOUR SAFETY IS INVOLVED!

SIGNAL WORDS: Note the use of signal words DANGER, WARNING, and CAUTION with the safety messages. The appropriate signal word for each has been selected using the following guidelines:

DANGER: Indicates an imminently hazardous situation, which if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations, **typically for machine components which, for functional purposes, cannot be guarded.**

WARNING: Indicates a potentially hazardous situation, which if not avoided, could result in death or serious injury, and **includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.**

CAUTION: Indicates a potentially hazardous situation, which if not avoided, **may result in minor or moderate injury. It may also be used to alert against unsafe practices.**

SAFETY PRECAUTIONS

GENERAL INFORMATION

This section is composed of various warnings and safety tips. **Read and learn all the information in this section before you attempt to use your blade.** Also read your loader owner's manual before using your equipment. This knowledge will help you operate your unit safely. **Do not take this information lightly, it is presented for your own benefit and for the benefit of others working around you.**

The "Safety Alert Symbol", as previously described, will be used throughout this manual. It will appear with the word **DANGER**, **WARNING**, or **CAUTION** above it, and a safety message pertaining to the specific topic being covered. Take the time to read these messages as you come across them.

TO THE OPERATOR

The primary responsibility for safety with the equipment falls to the operator. Make sure that the equipment is operated only by responsible individuals with the proper instruction. It is the skill, care, common sense, and good judgment of the operator that will determine how efficiently and safely the job is performed. Know your equipment before you start. Know its capabilities, dimensions, and how to operate all the controls. Visually inspect your equipment before you start, and never operate equipment that is not in proper working order.

BEFORE YOU START

1. **Read the entire loader and attachment operator's manuals** before ever attempting to use the loader. This knowledge is necessary for safe operation.
2. **Follow all safety decals.** Keep them clean and replace them if they become worn and hard to read.
3. **Do not paint over,** remove, or deface any safety signs or warning decals on your equipment.
4. **Know your equipment inside and out.** Know how to operate all controls, and know emergency shut down procedures.
5. **Keep all stepping surfaces, pedals, and controls free from dirt, grease, and oil.** Keep equipment clean to help avoid injury from a fall when getting on or off equipment.
6. **Use handholds and step plates when getting on/off the skid-steer.** Failure to do so could cause a fall.
7. **Be alert to others in the work area.** Be sure others know when and where you will be working. Make sure no one is behind equipment.
8. **Never take passengers on your equipment.** There is no safe place for a passenger.

SAFETY PRECAUTIONS

9. **Never try to board equipment while it is moving.**

10. **Turn off engine before performing maintenance.** If lift arms must be left raised for maintenance or any other reason, use a positive lift arm lock to secure the arms in place. Serious damage or personal injury could result from lift arms accidentally lowering.

11. **Reduce speed when driving over rough terrain,** on a slope, or turning, to avoid overturning the loader.

12. **Test all controls before you begin.**

13. **Do not smoke when refueling.** Allow room in the gas tank for expansion. Wipe up any spilt fuel. Secure cap tightly when done.

WORKING WITH THE BLADE

1. **Never operate the blade without first understanding the operator's manual.**

2. **Do not lift or carry people on the blade;** they could fall and be crushed.

3. **Check your work area and know where all utility lines are.** Avoid hitting underground electrical wires, cables, pipes, fence posts, gas lines, uneven sidewalk edges, large rocks, etc.

4. **Never operate equipment while under the influence** of alcohol or prescription drugs, which could inhibit physical and/or mental capacity.

5. **Use for blade only for its designed purpose.** Do not use it to pull objects, as a battering ram, or attach ropes or chains to the unit.

6. **Never work under a raised blade.**

7. **Do not push loads or objects in excess of loader/blade capacity.**

8. **Always lower the loader arms and blade to the ground,** shut off the engine, and apply the parking brake before getting off the unit.

TRANSPORTING THE BLADE

1. **Follow all federal, state, and local regulations when transporting the unit on public roads.**

2. **Carry blade low when transporting to lower its center of gravity. Use extra care when loading or unloading the machine onto a trailer or truck.**

MAINTENANCE

1. **Never work on equipment while it is running.** Set brake and lower blade before performing repairs.

2. **Never make hydraulic repairs while the system is under pressure**, or the cylinders are under load. Injury or death could result.

SAFETY PRECAUTIONS

3. **Observe proper maintenance schedules** and repairs to keep the unit in safe working order.

4 **Always wear safety goggles or glasses when working on equipment.**

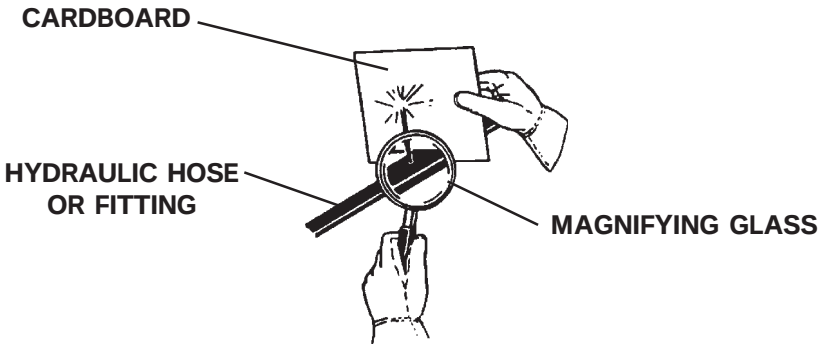
5. **Use a drift and hammer when pressing out pins** to prevent the pin from shattering.

6. **Use only manufacturer recommended replacement parts.** Other parts may be substandard in fit and quality.

WARNING! **Escaping fluid under pressure can have sufficient force to penetrate the skin, causing serious personal injury. Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, rather than hands, to search for suspected leaks.**

Keep unprotected body parts, such as face, eyes, and arms as far away as possible from a suspected leak. Flesh injected with hydraulic fluid may develop gangrene or other permanent disabilities.

If injured by injected fluid, see a doctor at once. If your doctor is not familiar with this type of injury, ask him to research it immediately to determine proper treatment.



INTERNATIONAL SYMBOLS

As a guide to the operation of your equipment, various international symbols have been utilized on the instruments and controls. The symbols are shown below with an indication of their meaning.


Engine speed


Hours recorded


Engine water temperature


Lights


Horn


Engine oil pressure


Hazard warning


Axle connect


Axle disconnect


Continuously variable


Increase

Decrease

Diesel fuel


Creeper range


High range


Low range


Alternator charge


Power take-off (on)


Power take-off (off)


"Tortoise," slow or minimum setting


"Hare," fast or maximum setting


Caution


Control lever operating direction


Rock shaft (raised)


Rock shaft (lowered)


Remote cylinder (extended)


Remote cylinder (retracted)


Remote cylinder (FLOAT)


Differential lock


Read operators manual

Neutral


Forward


Reverse

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PREOPERATION

HYDRAULIC BLADE

GENERAL INFORMATION

The BRADCO hydraulic angle and tilt blades were designed to be easy to use and maintain. There are three different hydraulic kits available: dual auxiliary hydraulics, selector valve, and electrical solenoid valve kit. They are all operated by the loaders auxiliary hydraulics and the blade mounts to the toolbar / quick attach mechanism for easy mounting.

Unless noted otherwise, right and left are determined from the position of the operator facing forward.

Remember to read the "Safety Precautions" and "Operating Instructions" sections of this manual BEFORE you attempt to install or use the attachment.

NOTE: The illustrations and data used in this manual were current (according to the information available to us) at the time of printing, however, we reserve the right to redesign and change the tillers as may be necessary without notification.

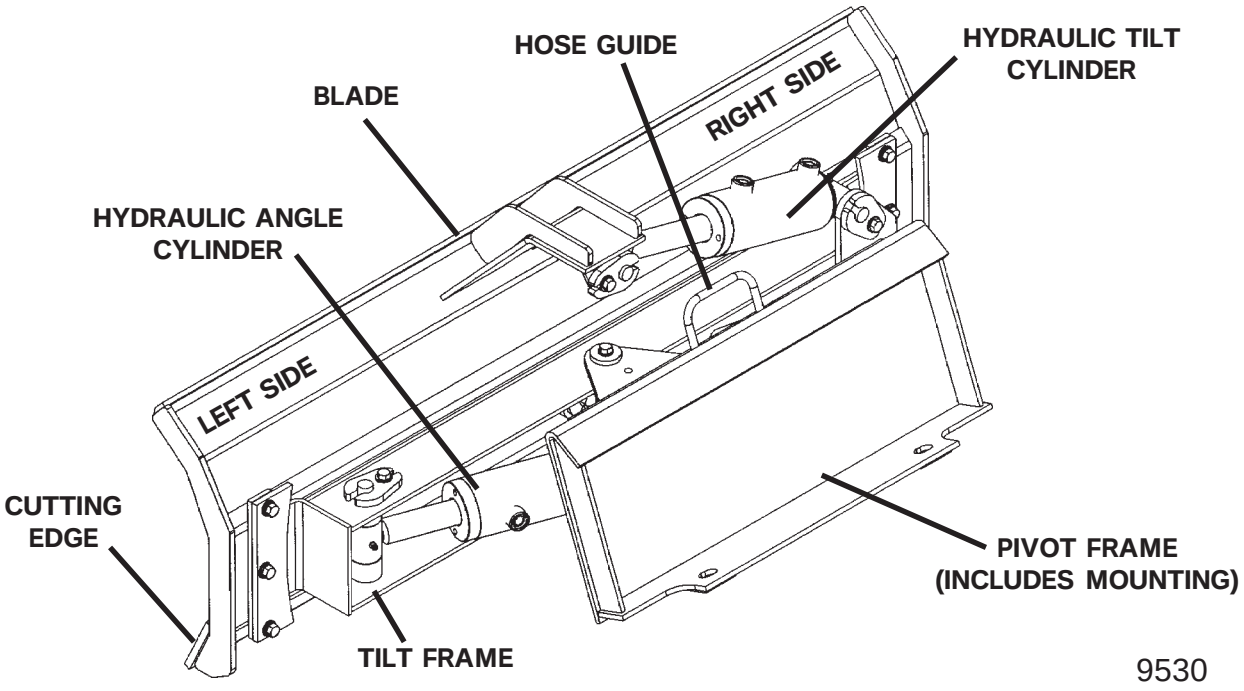
BEFORE OPERATION

The primary responsibility for safety with this equipment falls to the operator. Make sure that the equipment is operated only by trained individuals that have read and understand this manual.

If there is any portion of this manual or function you do not understand, contact your local authorized dealer or the manufacturer.

NOMENCLATURE

Throughout this manual, reference is made to various blade components. Study the following diagram to acquaint yourself with the various names of these components. This knowledge will be helpful when reading through this manual or when ordering service parts.



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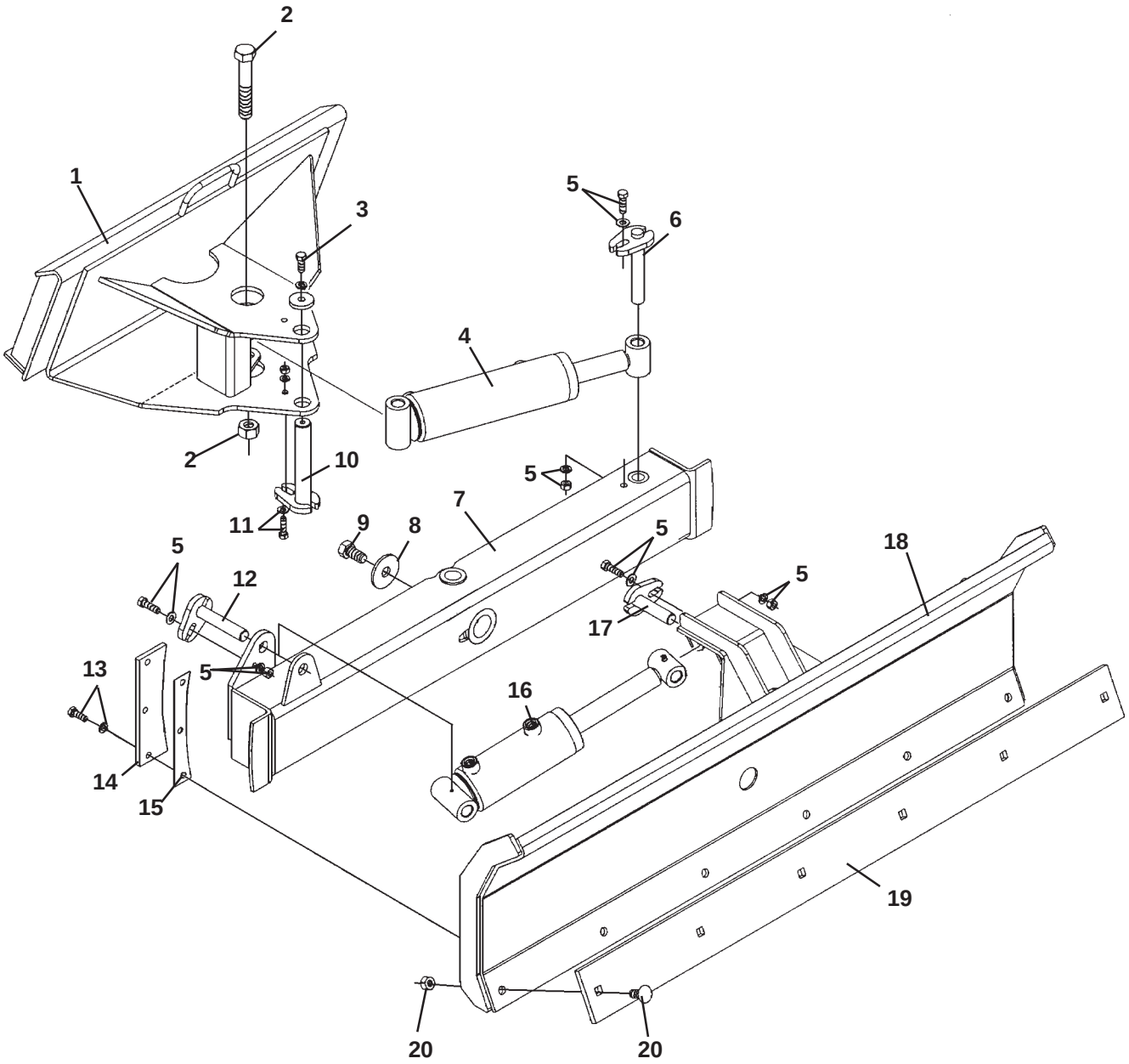
HYDRAULIC BLADE ASSEMBLY

HYDRAULIC ANGLE BLADE WITH TILT



HYDRAULIC BLADE ASSEMBLY

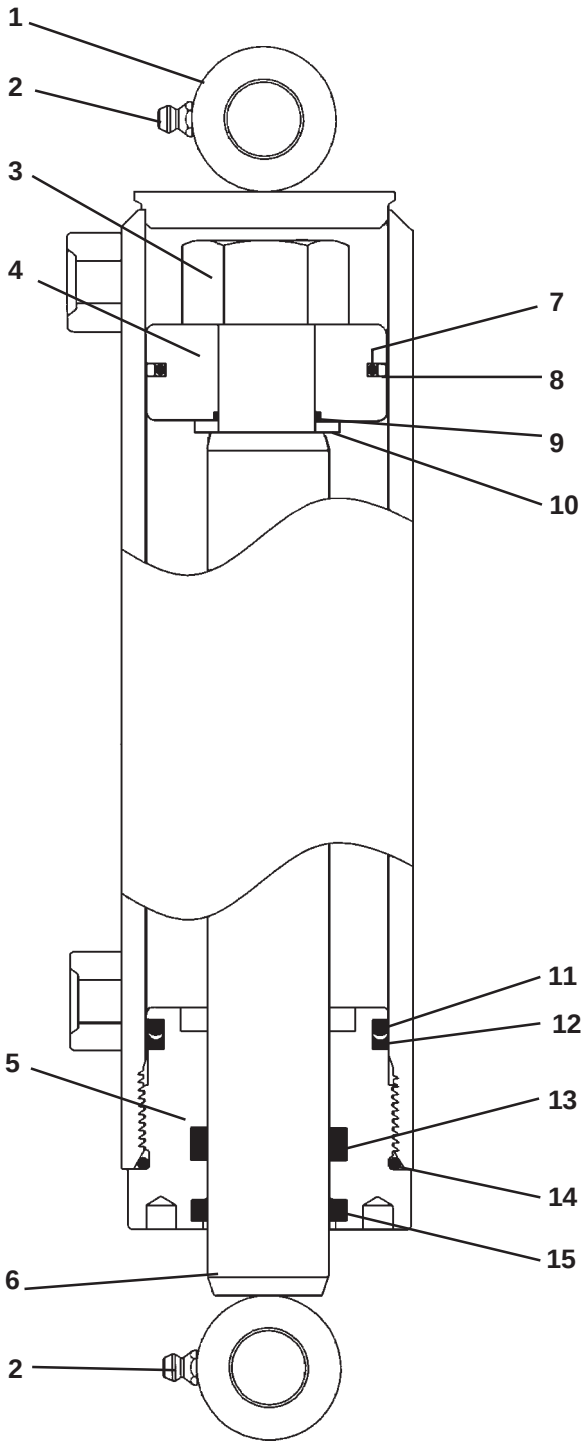
HYDRAULIC ANGLE BLADE WITH TILT

NO	REQ'D	PART NO.	DESCRIPTION
1	1	**	Pivot Frame with Mount
2	1	10122	.75" UNC X 5.00" Hex Capscrew - Grade 8
	1	1936	.75" UNC Deformed Lock Nut
3	1	1043	.38" UNC X 1.00" Hex Capscrew
	1	1503	.38" Lock Washer
	1	2000072	Special Washer 1.50" X .45" X .25"
4	1	18024	Cylinder Assembly
	2	6616	Grease Fitting
5	3	1044	.38" UNC X 1.25" Hex Capscrew
	3	1514	.38" Flat Washer
	3	1503	.38" Lock Washer
	3	1536	.38" UNC Nylock Nut
6	1	19588	Pivot Pin .75" X 4.58"
7	1	18620	Tilt Frame
	3	6616	Grease Fitting
8	1	18597	Special Washer 2.25" X .69" X .19"
9	1	1113	.62" UNC X 1.25" Hex Capscrew
10	1	18589	Pivot Pin 1.00" X 5.82"
11	1	1023	.31" UNC X 1.25" Hex Capscrew
	1	1513	.31" Flat Washer
	1	1502	.31" Lock Washer
	1	1225	.31" UNC Hex Nut
12	1	18587	Pivot Pin .75" X 3.75"
13	6	1043	.38" UNC X 1.00" Hex Capscrew
	6	1503	.38" Lock Washer
14	2	18586	Clamp Plate
15	2	19662	Shim Plate
16	1	19336	Cylinder Assembly
	2	6616	Grease Fitting
17	1	18588	Pivot Pin .75" X 2.81"
18	1	18619	46" Blade
	1	102041	67" Blade
19	1	2005076	46" Cutting Edge
	1	101460	67" Cutting Edge
20	6	1872	.50" UNC X 1.50" Carriage Bolt GR 5 (46" Blade)
	8	1872	.50" UNC X 1.50" Carriage Bolt GR 5 (67" Blade)
	6	1841	.50" UNC Deformed Lock Nut (46" Blade)
	8	1841	.50" UNC Deformed Lock Nut (67" Blade)

**** Pivot Frame with Mount is specific to your loader application. Contact Factory or your local BRADCO dealer to order this item.**

CYLINDER ASSEMBLY

CYLINDER ASSEMBLY #18024



CYLINDER ASSEMBLY

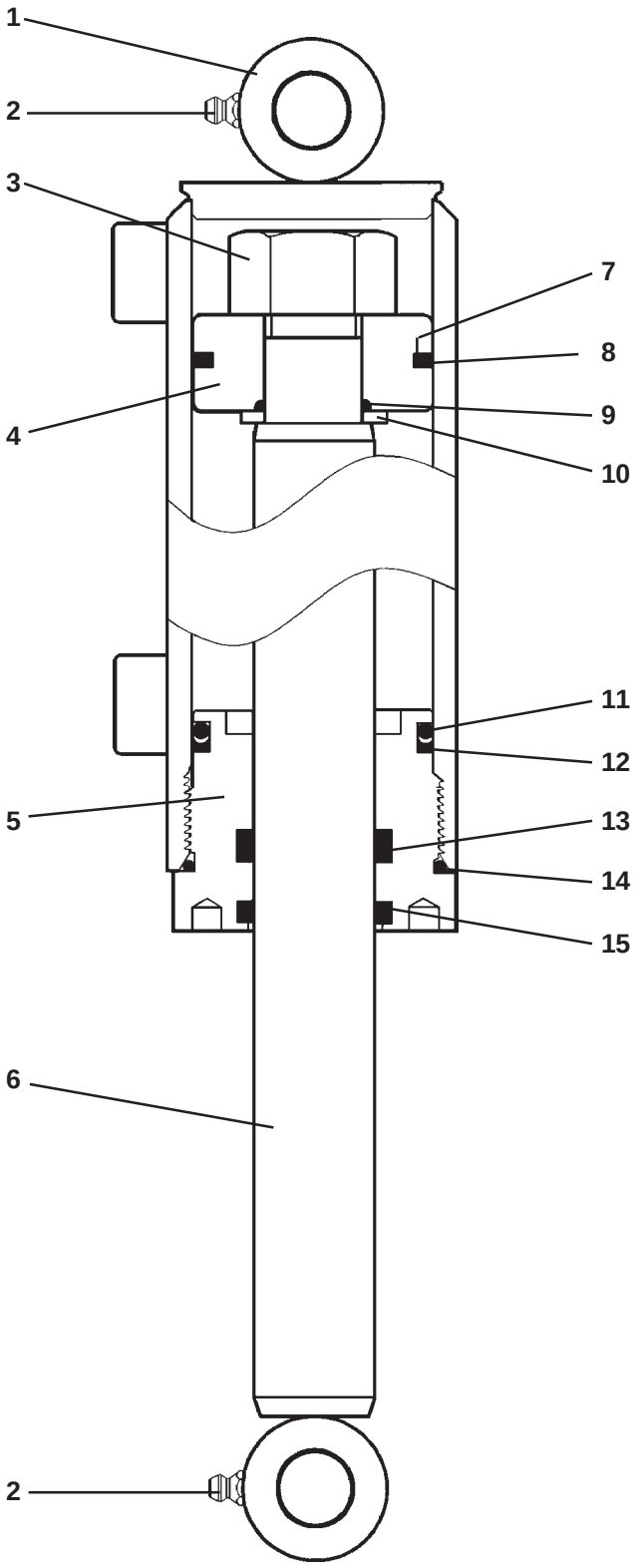
CYLINDER ASSEMBLY #18024

NO	REQ'D	PART NO.	DESCRIPTION
1	1	18026	Cylinder Tube
2	2	6616	Grease Fitting
3	1	1483	Lock Nut
4	1	50252	Piston
5	1	77458	Cylinder Gland
6	1	18025	Cylinder Rod
7	1	4645*	O-Ring
8	1	4644*	Piston Ring
9	1	4641*	O-Ring
10	1	5421	Washer
11	1	4509*	O-Ring
12	1	4510*	Back-Up Washer
13	1	45219*	Poly-Pak Seal
14	1	45250	O'Ring
15	1	45389*	Rod Wiper

NOTE: Seal kit #45617 includes all parts marked with an asterisk (*). Part are not sold separately.

CYLINDER ASSEMBLY

CYLINDER ASSEMBLY #19336



CYLINDER ASSEMBLY

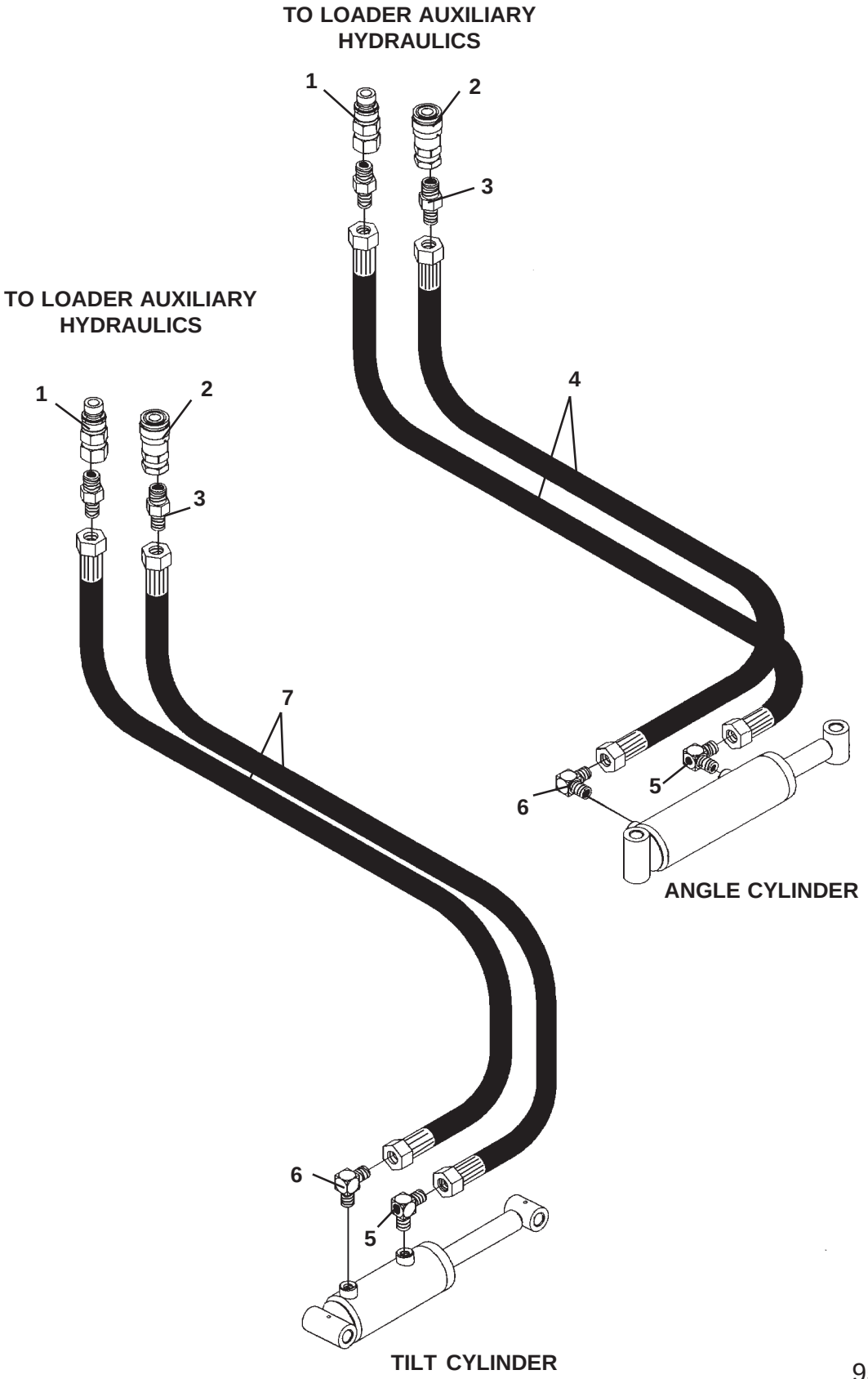
CYLINDER ASSEMBLY #19336

NO	REQ'D	PART NO.	DESCRIPTION
1	1	19337	Cylinder Tube
2	2	6616	Grease Fitting
3	1	1483	Hex Nut
4	1	50252	Piston
5	1	77458	Cylinder Gland
6	1	19338	Cylinder Rod
7	1	4645*	O-Ring
8	1	4644*	Piston Ring
9	1	4641*	O-Ring
10	1	5421	Washer
11	1	4509*	O-Ring
12	1	4510*	Back-Up Washer
13	1	45219*	Poly-Pak Seal
14	1	45250*	O-Ring
15	1	45389*	Rod Wiper

NOTE: Seal kit #45617 includes all parts marked with an asterisk (*). Parts are not sold separately.

HYDRAULIC ASSEMBLY

DUAL AUXILIARY HYDRAULIC ASSEMBLY



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HYDRAULIC ASSEMBLY

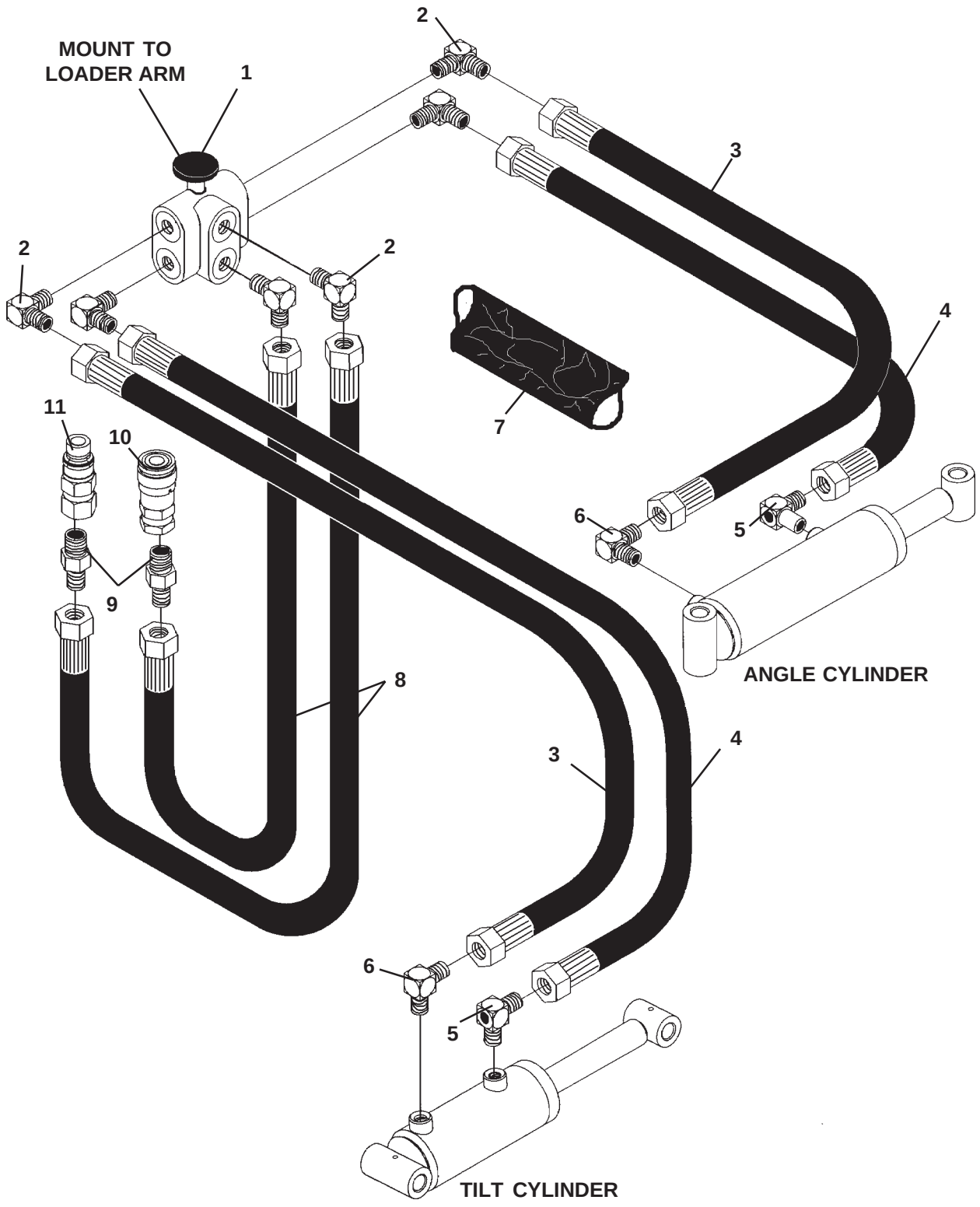
DUAL AUXILIARY HYDRAULIC ASSEMBLY

NO	REQ'D	PART NO.	DESCRIPTION
1	2	**	Male Coupler
2	2	**	Female Coupler
3	4	3269	Straight Connector 8MBo-6MJ
4	2	37263	Hose Assembly .25" x 48" 6FJX - 6FJX
5	2	14067	90° Elbow 6MBo-6MJ with .027 Orifice
6	2	3434	90° Elbow 6MBo-6MJ
7	2	37575	Hose Assembly .25" x 53" 6FJX - 6FJX

**** Hydraulic couplers are specific to your loader application. Contact Factory or your local BRADCO dealer to order these items.**

HYDRAULIC ASSEMBLY

SELECTOR VALVE HYDRAULIC ASSEMBLY



HYDRAULIC ASSEMBLY

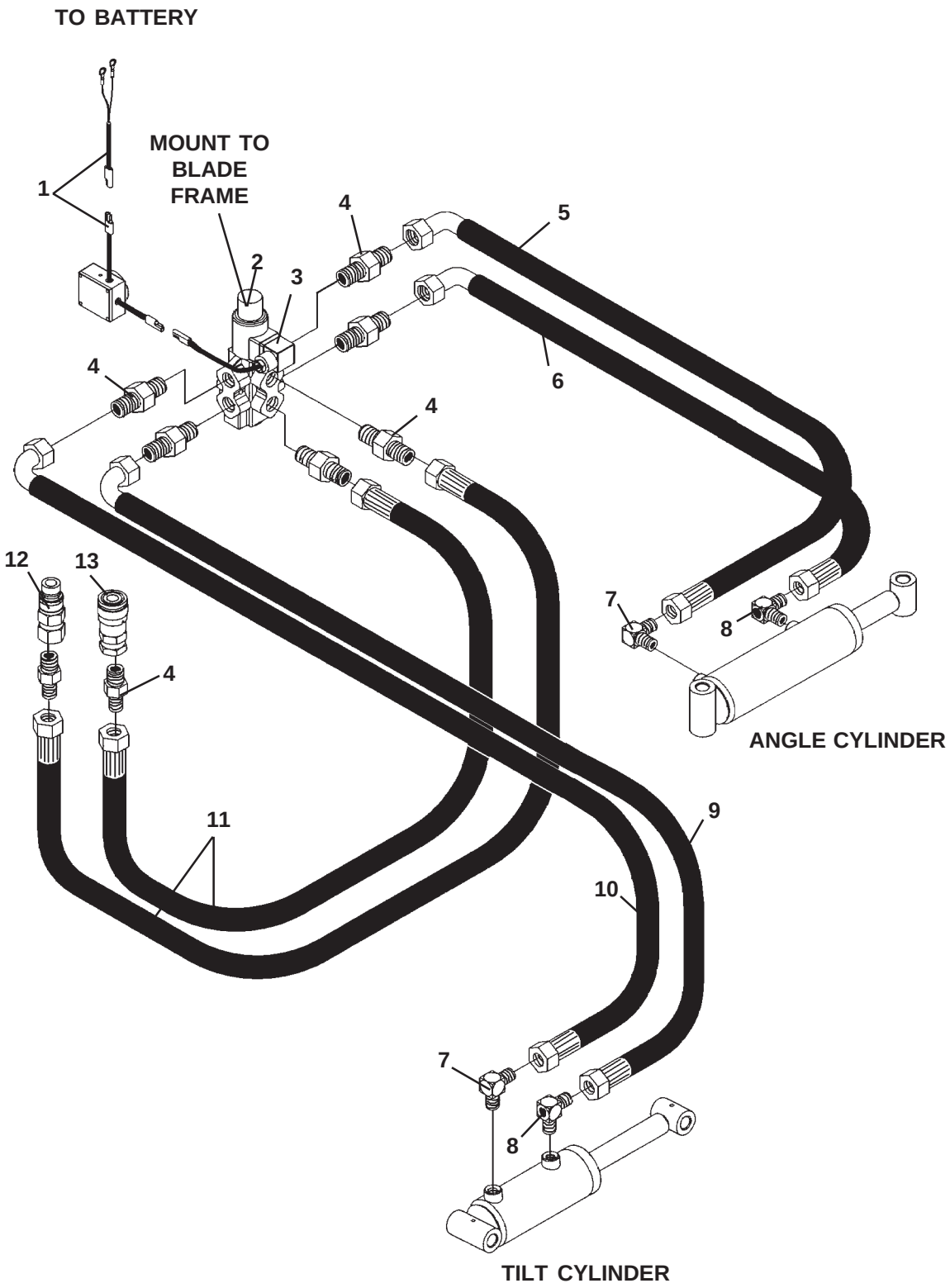
SELECTOR VALVE HYDRAULIC ASSEMBLY

NO	REQ'D	PART NO.	DESCRIPTION
1	1	88953	Selector Valve
2	6	30142	90° Elbow 8MBo-6MJ
3	2	35692	Hose .25" X 103" 6JFX-6FJX
4	2	37442	Hose .25" X 92" 6JFX-6FJX
5	2	14067	90° Elbow 6MBo-6MJ with .027 Orifice
6	2	3434	90° Elbow 6MBo-6MJ
7	6'	34052	Hose Sock (For Cylinder Hoses)
8	2	35875	Hose Assembly .25" X 60" 6FJX-6FJX
9	2	3269	Straight Connector 8MBo-6MJ
10	1	**	Female Coupler
11	1	**	Male Coupler

**** Hydraulic couplers are specific to your loader application. Contact Factory or your local BRADCO dealer to order these items.**

HYDRAULIC ASSEMBLY

ELECTRIC SOLENOID VALVE HYDRAULIC ASSEMBLY



HYDRAULIC ASSEMBLY

ELECTRIC SOLENOID VALVE HYDRAULIC ASSEMBLY

NO	REQ'D	PART NO.	DESCRIPTION
1	1	15757	Electrical Wire Control Harness
2	1	19687	Solenoid Valve
	2	1007	.25" UNC X 2.00" Hex Capscrew
	2	1501	.25" Lock Washer
	2	1224	.25" UNC Hex Nut
3	1	85386	DIN Connector
4	8	30324	Straight Connector 8MBo-6MFS
5	1	38130	Hose Assembly .25" x 18" 6FFS-6FFS 90°
6	1	38131	Hose Assembly .25" x 22.50" 6FFS-6FFS 90°
7	2	30204	90° Elbow 6MBo-6MFS
8	2	30209	90° Elbow 6MBo-6MFS with .027 Orifice
9	1	38189	Hose Assembly .25" x 16" 6FFS-6FFS 90°
10	1	38192	Hose Assembly .25" x 19" 6FFS-6FFS 90°
11	2	38132	Hose Assembly .25" x 48" 6FFS-6FFS
12	1	**	Male Coupler
13	1	**	Female Coupler

**** Hydraulic couplers are specific to your loader application. Contact Factory or your local BRADCO dealer to order these items.**

INSTALLATION AND OPERATION

ATTACHING

Your blade was shipped complete with the appropriate mounting for your specific unit, and the hydraulic hoses and couplers were installed for the kit you ordered.

Install the blade by following your power unit operator's manual for installing an attachment.

WARNING! To Avoid Serious Personal Injury, make sure the blade is securely latched to the attachment mechanism of your unit. Failure to do so could result in separation of the bucket from the unit.

If using the selector valve hydraulic kit, mount the selector valve to the arm of the loader. If powering the blade with the electrical solenoid valve hydraulic kit, connect the electrical wire harness to the battery of the skid-steer, and position the control box in a location accessible by the operator. Connect the hydraulic quick couplers to the auxiliary hydraulics, and route the hoses in such a fashion as to prevent chafing and pinching.

WARNING! When working around batteries, remember that all of the exposed metal parts are "live". Never lay a metal object across the terminals, because a spark or short circuit may result.

DANGER! BATTERY ACID CAUSES SEVERE BURNS. Batteries contain sulfuric acid. Avoid contact with skin, eyes, or clothing. Antidote: EXTERNAL - flush with water. INTERNAL - drink large quantities of water or milk. Follow with milk of magnesia, beaten egg or vegetable oil. Call physician immediately. EYES - flush with water for 15 minutes and get prompt medical attention.

Start engine and slowly cycle the cylinders several times to purge system of air and check for proper hydraulic connection, hose routing, and hose length.

Check the attachment for proper assembly, installation, and hydraulic leaks.

OPERATING INSTRUCTIONS

Simplicity of operation is one of the key features of the BRADCO blades. There are only a few controls that affect the blade. It is important however, to be familiar with, and know the controls and adjustments on both the blade and loader.

The blade mounts to the quick attach mechanism of your loader. Due to this arrangement, thorough knowledge of the loader controls is necessary for blade operation. Read your loader operator's manual for information regarding loader operation before attempting to use the blade.

ANGLING AND TILTING THE BLADE

The blade is angled and tilted hydraulically by cylinders connected from the blade to the pivot frame and tilt frame. The blade can be angled 35° left or right.

The angle and tilt cylinders are activated by the auxiliary hydraulic system controls. If using the selector valve, the position of the valve handle determines the cylinder being activated. If using the electric solenoid valve, the cylinder being activated is determined by the toggle switch on the control box.

CAUTION! **Drive slowly and with caution when operating the blade. The force of the impact if the blade hits an immovable object could cause damage to the blade and loader, and injury to the operator.**

OPERATING TIPS

Clean the area of trash, branches, and rocks before operation to prevent equipment damage.

Always begin with the slowest ground speed possible. Increase speed if surrounding conditions permit.

Always use full throttle (maximum engine speed).

When leveling, scraping, and surface stripping, lower the cutting edge to the ground, the blade will bite into the ground as you move forward.

Watch for holes, rocks, or other hidden hazards. Always inspect area prior to operation.

DETACHING

On firm level ground, lower the boom arms completely down on the frame until the blade is level and approximately 2" off the ground.

Turn off the engine. Move the control levers back and forth to relieve pressure in line. Disconnect couplers. NOTE: If using the electrical solenoid valve, disconnect the wire harness coming from the battery to the control box, and attach the control box onto the blade assembly.

NOTE: Connect couplers together or install caps to prevent contaminants from entering the hydraulic system.

Follow your power unit operator's manual for detaching (removing) an attachment.

NOTE: Frequent lubrication of grease fittings at the end of the cylinder and pivot points with a multi-purpose grease will greatly increase life of the product.

STORAGE

1. Clean the unit thoroughly, removing all mud, dirt, and grease.
2. Inspect for visible signs of wear, breakage, or damage. Order any parts required, and make the necessary repairs or avoid delays when starting next season.
3. Tighten loose nuts, capscrews, and hydraulic connections.
4. Cap hydraulic couplers to protect against contaminates.
5. Touch up all unpainted surfaces with paint to prevent rust.
6. Coat the exposed portions of the cylinder rods with grease.
7. Store the unit in a dry and protected place. Leaving the unit outside will materially shorten its life.

GENERAL INFORMATION

Regular maintenance is the key to long equipment life and safe operation. Maintenance requirements have been reduced to the absolute minimum. However, it is very important that these maintenance functions be performed as described below.

DAILY

- Check all bolts and nuts for tightness.
- Replace any missing bolts or nuts with approved replacement parts.
- Check hydraulic system for hydraulic oil leaks. See procedure below.
- Visually inspect the machine for worn parts or cracked welds, and repair as necessary.

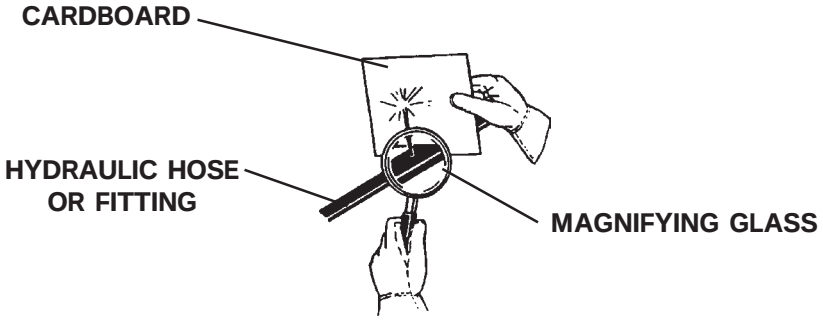
EVERY 40 HOURS

- Lubricate all grease fittings.

WARNING! **Escaping fluid under pressure can have sufficient force to penetrate the skin, causing serious personal injury. Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, rather than hands, to search for suspected leaks.**

Keep unprotected body parts, such as face, eyes, and arms as far away as possible from a suspected leak. Flesh injected with hydraulic fluid may develop gangrene or other permanent disabilities.

If injured by injected fluid, see a doctor at once. If your doctor is not familiar with this type of injury, ask him to research it immediately to determine proper treatment.



IMPORTANT: When replacing parts, use only factory approved replacement parts. Manufacturer will not claim responsibility for use of unapproved parts or accessories, and/or other damages as a result of their use.

CYLINDER SEAL REPLACEMENT

GENERAL INFORMATION

The following information is provided to assist you in the event you should need to repair or rebuild a hydraulic cylinder. When working on hydraulic cylinders, make sure that the work area and tools are clean and free of dirt to prevent contamination of the hydraulic system and damage to the hydraulic cylinders.

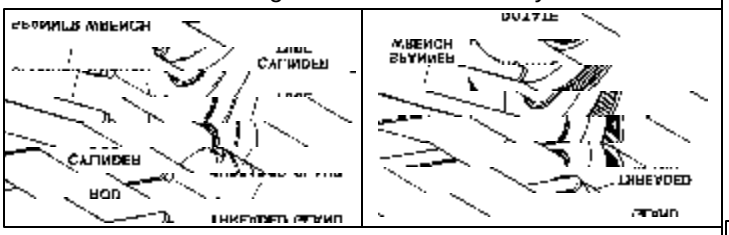
Always protect the active part of the cylinder rod (the chrome section). Nicks or scratches on the surface of the rod could result in cylinder failure. Clean all parts thoroughly with a cleaning solvent before reassembly.

DISASSEMBLY PROCEDURE

IMPORTANT: Do not contact the active surface of the cylinder rod with the vise. Damage to the rod could result.

THREADED TYPE GLAND

1. Rotate the gland with a spanner wrench counterclockwise until the gland is free of the cylinder tube.

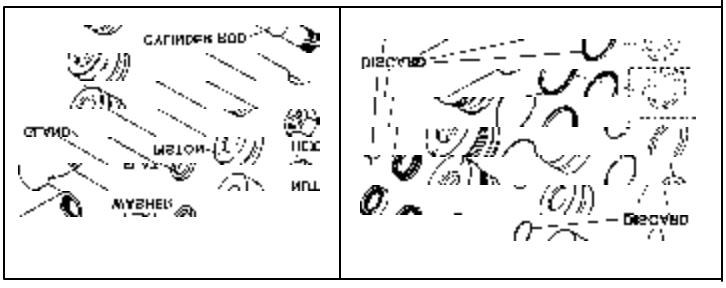


2. Pull the cylinder rod from the cylinder tube.

3. Inspect the piston and the bore of the cylinder tube for deep scratches or galling. If damaged, the piston and cylinder tube must be replaced.

4. Remove the hex nut, piston, flat washer or spacer tube (if so equipped), and gland from the cylinder rod. If the cylinder rod is rusty, scratched, or bent, it must be replaced.

5. Remove and discard all the old seals.

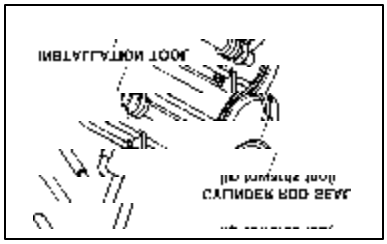


ASSEMBLY PROCEDURE

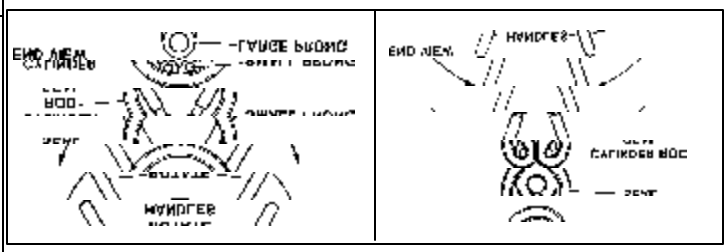
IMPORTANT: Replace all seals even if they do not appear to be damaged. Failure to replace all seals may result in premature cylinder failure.

1. Install the cylinder rod seal in the gland first. Be careful not to damage the seal in the process as it is somewhat difficult to install.

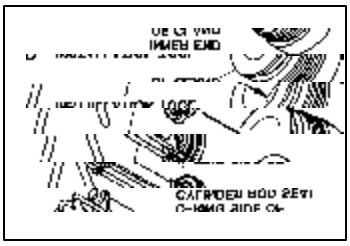
A special installation tool (Part #65349) is available to help with installing the seal. Simply fit the end of the tool over the seal so that the large prong of the tool is on the outside of the seal, and the two smaller prongs on the inside. The lip of the seal should be facing towards the tool.



Rotate the handles on the tool around to wrap the seal around the end of the tool.



Now insert the seal into the gland from the inner end. Position the seal in it's groove, and release and remove the tool. Press the seal into its seat the rest of the way by hand.

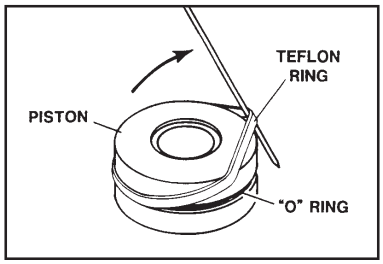


2. Install the new piston ring, rod wiper, O-rings and backup washers if applicable on the piston.

Be careful not to damage the seals. Caution must be used when installing the piston ring. The ring must be stretched carefully over the piston with a smooth, round, pointed tool.

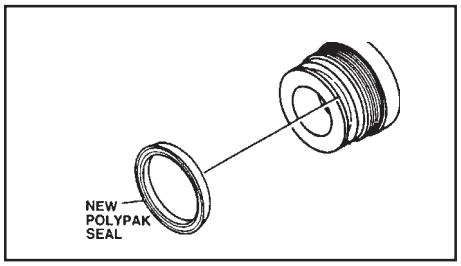
MAINTENANCE

CYLINDER SEAL REPLACEMENT

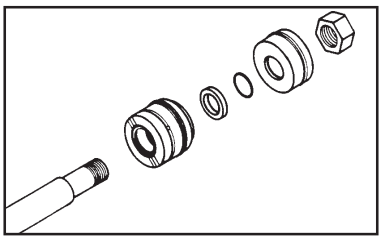


3. After installing the rod seal inside the gland as shown in step #1, install the external seal.

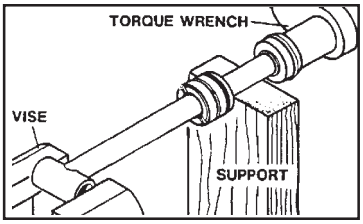
NOTE: Threaded glands may have been equipped with a separate O-ring and backup washer system or a polypak (all in one) type seal. Current seal kits contain a polypak (all in one) type seal to replace the discarded seal types on ALL THREADED GLANDS.



4. Slide the gland onto the cylinder rod being careful not to damage the rod wiper. Then install the spacer, or flat washer (if so equipped), small o-ring, piston, and hex nut onto the end of the cylinder rod.



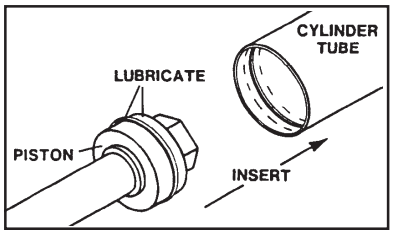
5. Secure the cylinder rod (mounting end) in a vise with a support at it's center. Torque the nut to the amount shown for the thread diameter of the cylinder rod (see chart).



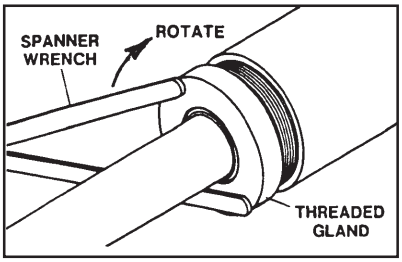
IMPORTANT: Do not contact the active surface of the cylinder rod with the vise. Damage to the rod could result.

6. Apply a lubricant (such as Lubriplate #105) to the piston and teflon ring. Insert the cylinder rod assembly into the cylinder tube.

IMPORTANT: Ensure that the piston ring fits squarely into the cylinder tube and piston groove, otherwise the ring may be damaged and a leak will occur.



7. Use a spanner wrench to rotate the gland clockwise into the cylinder. Continue to rotate the gland with the spanner wrench until it is tight.



NOTE: Seal kits will service most cylinders of similar bore size and rod diameter.

WARNING!

Cylinders serviced in the field are to be tested for leakage prior to the attachment being placed in work. Failure to test rebuilt cylinders could result in damage to the cylinder and/or the attachment, cause severe personal injury or even death.

TORQUE SPECIFICATION CHART

Use the following torque values when tightening the nuts on the cylinder rod threads.

Thread Diameter	POUNDS - FEET	
	Minimum	Maximum
7/8"	150	200
*1"	230	325
1-1/8"	350	480
1-1/4"	490	670
1-3/8"	670	900

*** 1" Thread Diameter WITH 1.25" Rod Diameter**
Min. 230 ft. lbs. Max. 250 ft. lbs.

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	REMEDY
Blade fails to angle or tilt.	Obstruction in hydraulic line.	Remove obstruction or replace.
	Hydraulic couplers not completely connected.	Check and tighten couplers.
	Hydraulic couplers malfunctioning or non-compatible.	Replace.
	Defective hydraulic cylinder.	Replace cylinder.
Blade angling or tilting too slowly.	Cold oil.	Warm oil with engine at idle.
	Engine speed too slow.	Open throttle.
	Oil leaking past cylinder packings.	Replace cylinder seals.
	Restriction in valve. (If so equipped.)	Clean or replace.
Blade fails to maintain angle or tilt.	Broken or leaking hydraulic lines.	Replace broken hose and check for leaks.
	Oil leaking past cylinder packings.	Replace cylinder seals.
	Internal leak in valve. (If so equipped.)	Clean or replace.
External leaking.	Cylinder seals damaged.	Replace and Repair.
	Broken or loose hydraulic fittings or line.	Check for leaks and repair or replace.
	Spool in valve leaking.	Replace seals.
Blade functions in one circuit only.	No electrical power to the blade solenoid valve. (If so equipped.)	Check for proper connection in control box and power from skid-steer.
	Selector valve set to opposite operation. (If so equipped.)	Position selector valve to correct operation.
Blade functions in one circuit only WITH power to the solenoid valve.	Blade valve malfunctioning.	Replace and Repair.
	Spool in valve sticking.	Clean or Replace.

BOLT TORQUE

BOLT TORQUE SPECIFICATIONS

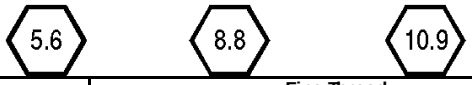
GENERAL TORQUE SPECIFICATION TABLE

Use the following torques when special torques are not given. These values apply to fasteners as received from suppliers, dry, or when lubricated with normal engine oil. They do not apply if special graphited or moly disulphide greases or other extreme pressure lubricants are used. This applies to both UNF and UNC threads. Remember to always use grade five or better when replacing bolts.

SAE Grade No.		2				5				8*			
Bolt head identification marks as per grade. NOTE: Manufacturing Marks Will Vary													
		TORQUE				TORQUE				TORQUE			
Bolt Size		Pounds Feet		Newton-Meters		Pounds Feet		Newton-Meters		Pounds Feet		Newton-Meters	
Inches	Millimeters	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
1/4	6.35	5	6	6.8	8.13	9	11	12.2	14.9	12	15	16.3	30.3
5/16	7.94	10	12	13.6	16.3	17	20.5	23.1	27.8	24	29	32.5	39.3
3/8	9.53	20	23	27.1	31.2	35	42	47.5	57.0	45	54	61.0	73.2
7/16	11.11	30	25	40.7	47.4	54	64	73.2	86.8	70	84	94.9	113.9
1/2	12.70	45	52	61.0	70.5	80	96	108.5	130.2	110	132	149.2	179.0
9/16	14.29	65	75	88.1	101.6	110	132	149.2	179.0	160	192	217.0	260.4
5/8	15.88	95	105	128.7	142.3	150	180	203.4	244.1	220	264	298.3	358.0
3/4	19.05	150	185	203.3	250.7	270	324	366.1	439.3	380	456	515.3	618.3
7/8	22.23	160	200	216.8	271.0	400	480	542.4	650.9	600	720	813.6	976.3
1	25.40	250	300	338.8	406.5	580	696	786.5	943.8	900	1080	1220.4	1464.5
1-1/8	25.58	-	-	-	-	800	880	1084.8	1193.3	1280	1440	1735.7	1952.6
1-1/4	31.75	-	-	-	-	1120	1240	1518.7	1681.4	1820	2000	2467.9	2712.0
1-3/8	34.93	-	-	-	-	1460	1680	1979.8	2278.1	2380	2720	3227.3	3688.3
1-1/2	38.10	-	-	-	-	1940	2200	2630.6	2983.2	3160	3560	4285.0	4827.4

* Thick Nuts must be used with Grade 8 bolts

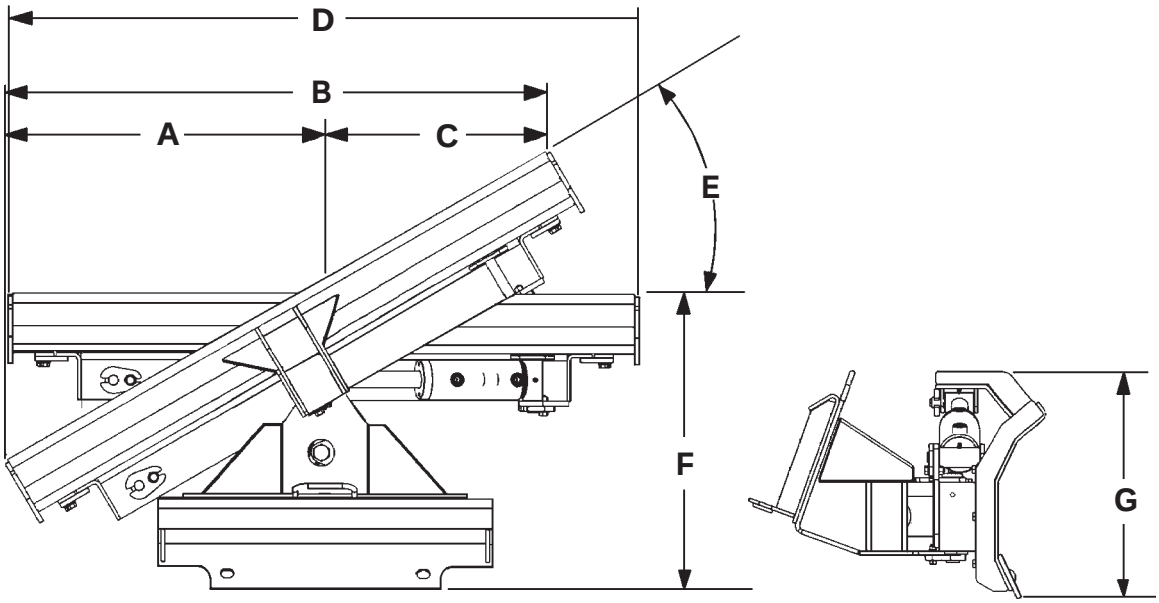
METRIC BOLT TORQUE SPECIFICATIONS



Size of Screw	Grade No.	Coarse Thread			Fine Thread		
		Ptich (mm)	Pounds Feet	Newton-Meters	Pitch (mm)	Pounds Feet	Newton-Meters
M6	5.6	1.0	3.6-5.8	4.9-7.9	-	-	-
	8.8		5.8-9.4	7.9-12.7		-	-
	10.9		7.2-10	9.8-13.6		-	-
M8	5.6	1.25	7.2-14	9.8-19	1.0	12-17	16.3-23
	8.8		17-22	23-29.8		19-27	25.7-36.6
	10.9		20-26	27.1-35.2		22-31	29.8-42
M10	5.6	1.5	20-25	27.1-33.9	1.25	20-29	27.1-39.3
	8.8		34-40	46.1-54.2		35-47	47.4-63.7
	10.9		38-46	51.5-62.3		40-52	54.2-70.5
M12	5.6	1.75	28-34	37.9-46.1	1.25	31-41	42-55.6
	8.8		51-59	69.1-79.9		56-68	75.9-92.1
	10.9		57-66	77.2-89.4		62-75	84-101.6
M14	5.6	2.0	49-56	66.4-75.9	1.5	52-64	70.5-86.7
	8.8		81-93	109.8-126		90-106	122-143.6
	10.9		96-109	130.1-147.7		107-124	145-168
M16	5.6	2.0	67-77	90.8-104.3	1.5	69-83	93.5-112.5
	8.8		116-130	157.2-176.2		120-138	162.6-187
	10.9		129-145	174.8-196.5		140-158	189.7-214.1
M18	5.6	2.0	88-100	119.2-136	1.5	100-117	136-158.5
	8.8		150-168	203.3-227.6		177-199	239.8-269.6
	10.9		175-194	237.1-262.9		202-231	273.7-313
M20	5.6	2.5	108-130	146.3-176.2	1.5	132-150	178.9-203.3
	8.8		186-205	252-277.8		206-242	279.1-327.9
	10.9		213-249	288.6-337.4		246-289	333.3-391.6

SPECIFICATIONS

HYDRAULIC BLADES



SPECIFICATIONS AND DESIGN ARE SUBJECT TO CHANGE WITHOUT NOTICE AND WITHOUT LIABILITY THEREFORE.

SPECIFICATIONS

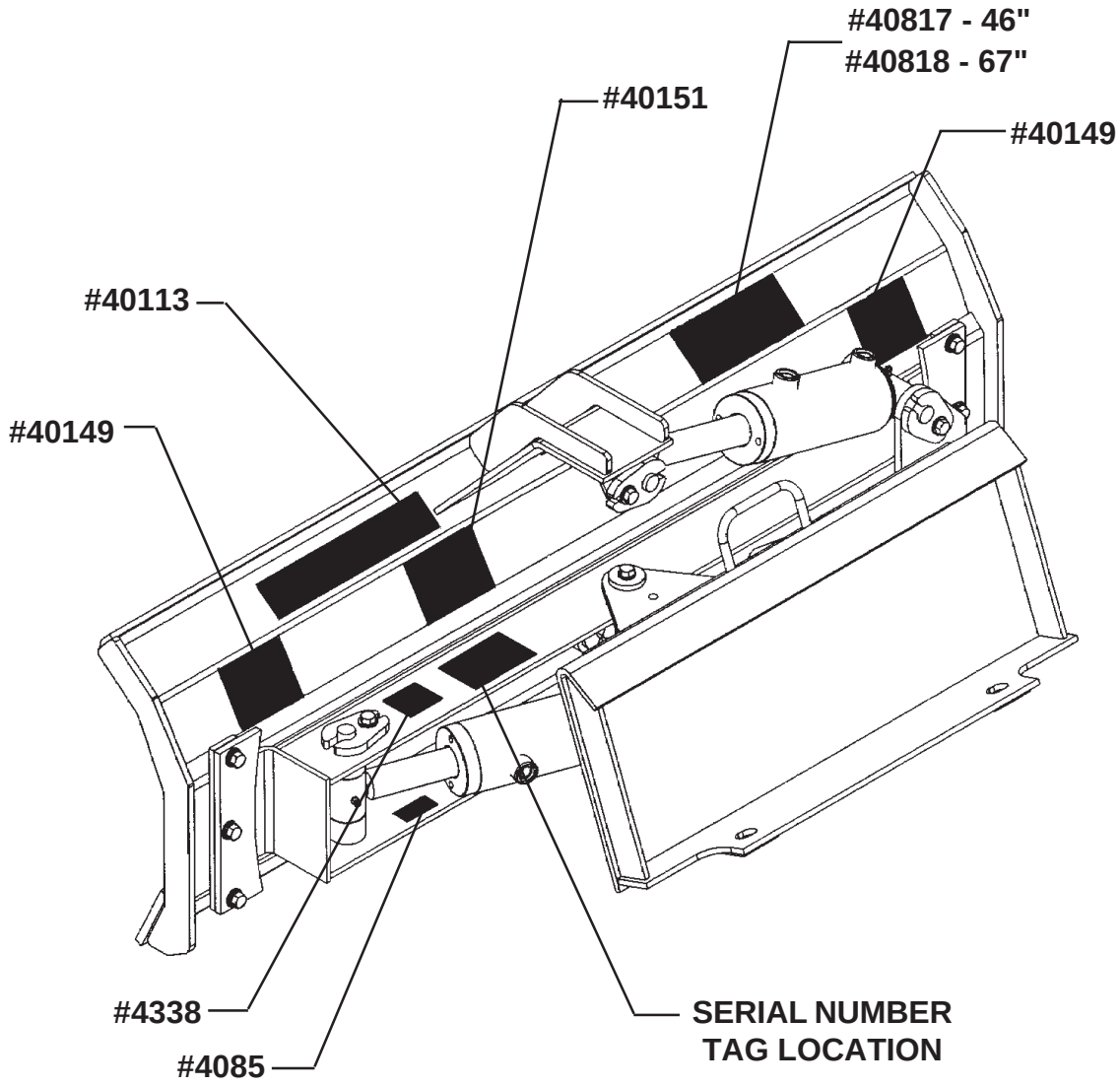
DESCRIPTION	ATP46	ATP67
A. Width from Centerline to Inside Edge @ 30° Angle	22.50"	31.25"
B. Blade Width @ 30° Angle	40.00"	57.75"
C. Width from Centerline to Outside Edge @ 30° Angle	17.50"	26.50"
D. Overall Width	46.75"	67.25"
E. Angle - Left and Right	30°	30°
F. Overall Length	22.10"	22.10"
G. Overall Height	16.95"	16.95"
Weight (LBS)	257#	310#
CYLINDER SPECIFICATIONS		
Angle Cylinder (#18024)		
Bore	2.50"	2.50"
Stroke	6.00"	6.00"
Rod Diameter	1.25"	1.25"
Tilt Cylinder (#19336)		
Bore	2.50"	2.50"
Stroke	3.12"	3.12"
Rod Diameter	1.25"	1.25"

DECALS

DECAL PLACEMENT

GENERAL INFORMATION

The diagram on this page shows the location of the decals used on the BRADCO Hydraulic Blade. The decals are identified by their part numbers, with reductions of the actual decals located on the following pages. Use this information to order replacements for lost or damaged decals. Be sure to read all decals before operating the attachment. They contain information you need to know for both safety and longevity.



IMPORTANT: Keep all safety signs clean and legible. Replace all missing, illegible, or damaged safety signs. When replacing parts with safety signs attached, the safety signs must also be replaced.

REPLACING SAFETY SIGNS: Clean the area of application with nonflammable solvent, then wash the same area with soap and water. Allow the surface to fully dry. Remove the backing from the safety sign, exposing the adhesive surface. Apply the safety sign to the position shown in the diagram above and smooth out any bubbles.

DECALS

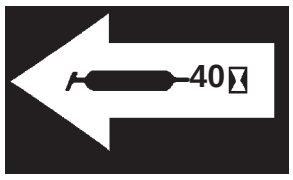
DECALS

BRADCO®

BRADCO LOGO
PART #40113

DANGER! PINCH POINTS
PART #40149

WARNING! HIGH PRESSURE FLUID
PART #40151



GREASE 40 HOURS
PART #4085

MADE IN USA
PART #4338

ATP46

MODEL NO. ATP46
PART #40817

ATP67

MODEL NO. ATP67
PART #40818

Limited Warranty

Except for the Excluded Products as described below, all new products are warranted to be free from defects in material and/or workmanship during the Warranty Period, in accordance with and subject to the terms and conditions of this Limited Warranty.

1. Excluded Products. The following products are excluded from this Limited Warranty:

(a) Any cable, part that engages with the ground (i.e. sprockets), digging chain, bearing, teeth, tamping and/or demolition head, blade cutting edge, pilot bit, auger teeth and broom brush that either constitutes or is part of a product.

(b) Any product, merchandise or component that, in the opinion of Paladin Light Construction[1], has been (i) misused; (ii) modified in any unauthorized manner; (iii) altered; (iv) damaged; (v) involved in an accident; or (vi) repaired using parts not obtained through Paladin Light Construction.

2. Warranty Period. The Limited Warranty is provided only to those defects that occur during the Warranty Period, which is the period that begins on the first to occur of: (i) the date of initial purchase by an end-user, (ii) the date the product is first leased or rented, or (iii) the date that is six (6) months after the date of shipment by Paladin Light Construction as evidenced by the invoiced shipment date (the "Commencement Date") and ends on the date that is twelve (12) months after the Commencement Date.

3. Terms and Conditions of Limited Warranty. The following terms and conditions apply to the Limited Warranty hereby provided:

(a) Option to Repair or Replace. Paladin Light Construction shall have the option to repair or replace the product.

(b) Timely Repair and Notice. In order to obtain the Limited Warranty, (i) the product must be repaired within thirty (30) days from the date of failure, and (ii) a claim under the warranty must be submitted to Paladin Light Construction in writing within thirty (30) days from the date of repair.

(c) Return of Defective Part or Product. If requested by Paladin Light Construction, the alleged defective part or product shall be shipped to Paladin Light Construction at its manufacturing facility or other location specified by Paladin Light Construction, with freight PRE-PAID by the claimant, to allow Paladin Light Construction to inspect the part or product.

Claims that fail to comply with any of the above terms and conditions shall be denied.

LIMITATIONS AND EXCLUSIONS.

THIS LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND ANY WARRANTY BASED ON A COURSE OF DEALING OR USAGE OF TRADE.

IN NO EVENT SHALL PALADIN LIGHT CONSTRUCTION BE LIABLE FOR CONSEQUENTIAL OR SPECIAL DAMAGES.

IN NO EVENT SHALL PALADIN LIGHT CONSTRUCTION BE LIABLE FOR ANY LOSS OR CLAIM IN AN AMOUNT IN EXCESS OF THE PURCHASE PRICE, OR, AT THE OPTION OF PALADIN LIGHT CONSTRUCTION, THE REPAIR OR REPLACEMENT, OF THE PARTICULAR PRODUCT ON WHICH ANY CLAIM OF LOSS OR DAMAGE IS BASED. THIS LIMITATION OF LIABILITY APPLIES IRRESPECTIVE OF WHETHER THE CLAIM IS BASED ON BREACH OF CONTRACT, BREACH OF WARRANTY, NEGLIGENCE OR OTHER CAUSE AND WHETHER THE ALLEGED DEFECT IS DISCOVERABLE OR LATENT.

[1]Attachment Technologies Inc., a subsidiary of Paladin Brands Holding, Inc. (PBHI) is referred to herein as Paladin Light Construction.

February 10, 2010