



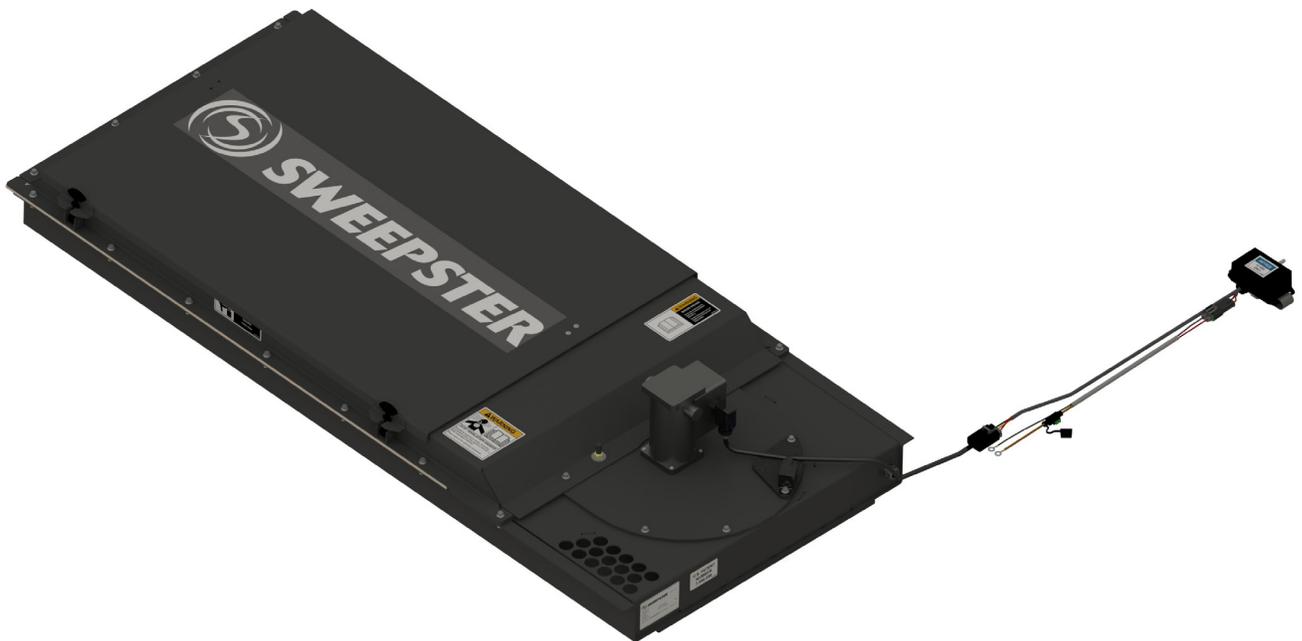
# Vacuum Attachment Patented



**PALADIN.**  
LIGHT CONSTRUCTION GROUP



*The Power of Combined Excellence*



Sweepster Serial Number \_\_\_\_\_

Manual Number: 51-4022  
Release Date: February 2013  
Rev. 3

## Notes

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# INTRODUCTION

## Purpose of Vacuum Attachment

This vacuum attachment is designed to reduce visible dust in construction cleanup, road maintenance and similar operations. Use in any other way is considered contrary to the intended use. Compliance with and strict adherence to operation, service and repair conditions, as specified by the manufacturer, are also essential elements of the intended use.

## Contacting Sweepster

If you have any questions about information in this manual or need to order parts, please call, write, fax or e-mail SWEEPSTER.

Sweepster  
2800 North Zeeb Road  
Dexter, Michigan 48130  
Phone: (734)-996-9116 - (800)-456-7100  
Fax: (734) 996-9014  
E-mail: [sweepster@paladinbrands.com](mailto:sweepster@paladinbrands.com)

For help with installation, operation or maintenance procedures, contact our Technical Service Department. Direct product questions and parts orders to our Sales Department.

When ordering parts or accessories, be prepared to give the following information:

- Sweeper model, serial number and date of purchase
- Prime mover, make and model
- Part number, description and quantity

## Terms Used in Manual

*Right-hand, left-hand, front and rear* are determined from the operator's perspective (either the operator's seat or standing behind a walk-behind unit), facing forward in the normal operating position.

## Warranty

To validate the warranty for this unit, fill out the warranty card or warranty pages located in the back of this manual. Then send this information to SWEEPSTER.

# SAFETY STATEMENTS

## DANGER!



THIS STATEMENT IS USED WHERE SERIOUS INJURY OR DEATH WILL RESULT IF THE INSTRUCTIONS ARE NOT FOLLOWED PROPERLY.

## WARNING!



THIS STATEMENT IS USED WHERE SERIOUS INJURY OR DEATH COULD RESULT IF THE INSTRUCTIONS ARE NOT FOLLOWED PROPERLY.

## CAUTION!



THIS STATEMENT IS USED WHERE MINOR INJURY COULD RESULT IF THE INSTRUCTIONS ARE NOT FOLLOWED PROPERLY.

## NOTICE!

THIS STATEMENT IS USED WHERE EQUIPMENT OR PROPERTY DAMAGE COULD RESULT IF THE INSTRUCTIONS ARE NOT FOLLOWED PROPERLY.



THIS SYMBOL BY ITSELF OR USED WITH A SAFETY SIGNAL WORD THROUGHOUT THIS MANUAL IS USED TO CALL YOUR ATTENTION TO INSTRUCTIONS INVOLVING YOUR PERSONAL SAFETY OR THE SAFETY OF OTHERS. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN INJURY OR DEATH.

## GENERAL SAFETY PRECAUTIONS

### WARNING!



#### **READ MANUAL PRIOR TO INSTALL**

Improper installation, operation, or maintenance of this equipment could result in serious injury or death. Operators and maintenance personnel should read this manual as well as all manuals related to this equipment and the prime mover thoroughly before beginning installation, operation, or maintenance. **FOLLOW ALL SAFETY INSTRUCTIONS IN THIS MANUAL AND THE PRIME MOVERS MANUAL.**

### WARNING!



#### **READ AND UNDERSTAND ALL SAFETY STATEMENTS**

Read all safety decals and safety statements in all manuals prior to operating or working on this equipment. Know and obey all OSHA regulations, local laws and other professional guidelines for your operation. Know and follow good work practices when assembling, maintaining, repairing, mounting, removing or operating this equipment.



#### **KNOW YOUR EQUIPMENT**

Know your equipment's capabilities, dimensions and operations before operating. Visually inspect your equipment before you start, and never operate equipment that is not in proper working order with all safety devices intact. Check all hardware to assure it is tight. Make certain that all locking pins, latches, and connection devices are properly installed and secured. Remove and replace any damaged, fatigued or excessively worn parts. Make certain all safety decals are in place and are legible. Keep decals clean, and replace them if they become worn and hard to read.

## GENERAL SAFETY PRECAUTIONS

### WARNING!



#### **PROTECT AGAINST FLYING DEBRIS**

Always wear proper safety glasses, goggles or a face shield when driving pins in or out or when operation causes dust, flying debris, or any other hazardous material.

### WARNING!



#### **LOWER OR SUPPORT RAISED EQUIPMENT**

Do not work under raised booms without supporting them. Do not use support material made of concrete blocks, logs, buckets, barrels or any other material that could suddenly collapse or shift positions. Make sure support material is solid, not decayed, warped, twisted, or tapered. Lower booms to ground level or onto blocks. Lower booms and attachments to the ground before leaving the cab or operator's station.

### WARNING!



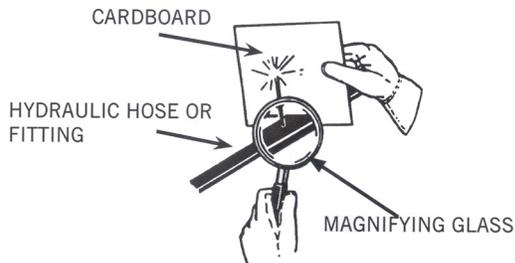
#### **USE CARE WITH HYDRAULIC FLUID PRESSURE**

Hydraulic fluid under pressure can penetrate the skin and cause serious injury or death. Hydraulic leaks under pressure may not be visible. Before connecting or disconnecting hydraulic hoses, read your prime movers operator's manual for detailed instructions on connecting and disconnecting hydraulic hoses or fittings.

- 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 immediately to determine proper treatment.

## GENERAL SAFETY PRECAUTIONS CONTINUED

- Wear safety glasses, protective clothing, and use a sound piece of cardboard or wood when searching for hydraulic leaks. **DO NOT USE YOUR HANDS! SEE ILLUSTRATION.**



### **WARNING!** DO NOT MODIFY MACHINE OR ATTACHMENTS



Modifications may weaken the integrity of the attachment and may impair the function, safety, life and performance of the attachment. When making repairs, use only the manufacturer's genuine parts, following authorized instructions. Other parts may be substandard in fit and quality. Never modify any ROPS (Roll Over Protection System) equipment or device. Any modifications must be authorized in writing by the manufacturer.

### **WARNING!** SAFELY MAINTAIN AND REPAIR EQUIPMENT



- Do not wear loose clothing, or any accessories that can catch in moving parts. If you have long hair, cover or secure it so that it does not become entangled in the equipment.
- Work on a level surface in a well-lit area.
- Use properly grounded electrical outlets and tools.
- Use the correct tool for the job at hand. Make sure they are in good condition for the task required.

## GENERAL SAFETY PRECAUTIONS CONTINUED

- Wear the protective clothing equipment specified by the tool manufacturer.

### **WARNING!** SAFELY OPERATE EQUIPMENT



Do not operate equipment until you are completely trained by a qualified operator in how to use the controls, know its capabilities, dimensions, and all safety requirements. See your prime movers manual for these instructions.

- Keep all step plates, grab bars, pedals, and controls free of dirt, grease, debris, and oil.
- Never allow anyone to be around the equipment when it is operating.
- Do not allow riders on the attachment or the prime mover.
- Do not operate the equipment from anywhere other than the correct operators position.
- Never leave equipment unattended with the engine running or with this attachment in a raise position.
- Do not alter or remove any safety feature from the prime mover or this attachment.
- Know your work site safety rules as well as traffic rules and flow. When in doubt on any safety issue, contact your supervisor or safety coordinator for an explanation.

### **WARNING!** EXPOSURE TO RESPIRABLE CRYSTALLINE SILICA DUST ALONG WITH OTHER HAZARDOUS DUSTS MAY CAUSE SERIOUS OR FATAL RESPIRATORY DISEASE.

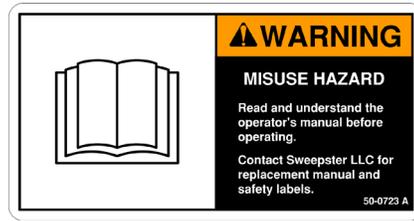


It is recommended to use dust suppression, dust collection and if necessary personal protective equipment during the operation of any attachment that may cause high levels of dust.

# SAFETY SIGNS & LABELS



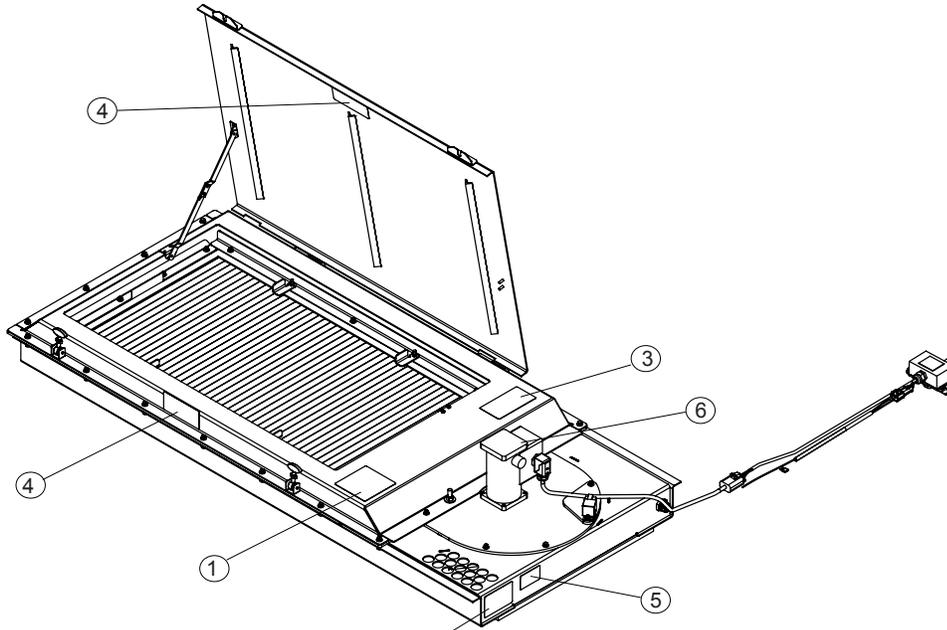
41043



50-0723



50-0737



Serial Number Location



50-0945



50-0955

Not on 24 VDC Units

## SAFETY SIGNS & LABELS

There are several specific signs on this attachment. The exact location of the hazards and description of the hazards are reviewed.

Item	Part	Qty	Description
1.	41043	1	Decal, Warning, Hazardous Dust
2.	50-0634	1	Label, Serial Number
3.	50-0723	1	Label, Warning, Misuse Hazard
4.	50-0737	2	Label, Warning, Pinch Point
5.	50-0945	1	Label, Patent, 7,958,596
6.	50-0955	1	Decal, Ansi, Notice, 12 VDC

### Placement or replacement of Safety Signs

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

### Instructions

1. Keep all safety signs clean and legible.
2. Replace all missing, illegible, or damaged safety signs.
3. Replacement parts, for parts with safety signs attached, must also have safety signs attached.
4. Safety signs are available, free of charge, from your dealer or from SWEEPSTER.

## OPERATION

### CAUTION!



Only fully trained operators or trainee operators under supervision of a fully trained person should use this machine.

Before operating sweeper with vacuum attachment:

- Learn sweeper and prime mover controls in an off-road location.
- Be sure that you are in a safe area, away from traffic or other hazards.
- Check all hardware making sure it is tight.
- Replace any damaged or fatigued hardware with properly rated fasteners.
- Make sure all hydraulic hardware and hydraulic fittings are tight.
- Replace any damaged or fatigued fittings hoses or wire harnesses.
- Always wear proper apparel such as a long sleeved shirt buttoned at the cuffs; safety glasses, goggles or a face shield; ear protection; and a dust mask.

While operating sweeper:

- When operating sweeper, adhere to all government rules, local laws and other professional guidelines for your sweeping application.
- Before leaving the operators area for any reason, STOP ENGINE.
- Keep hands, feet, hair and other loose clothing away from all moving parts.
- Leave the shields and safety equipment in place when operating the sweeper with vacuum attachment.
- Note any repairs needed during operation of the sweeper. Report any needed repairs.

• Vacuum attachment requires that the sweeper's skirting and bucket body seals are properly adjusted and functioning.

• DURING WET OR DAMP CONDITIONS FAN SHOULD BE TURNED OFF.

• Before dumping debris filled bucket, or when filter obstruction occurs and allows dust to escape, the filter needs to be shaken.

## SERVICE & REPAIR

Repair or adjust the attachment in a safe area, away from traffic and other hazards.

1. TO SHAKE FILTER, STOP BRUSH AND FAN MOTOR. Operate shaker motor for 5 to 10 seconds.

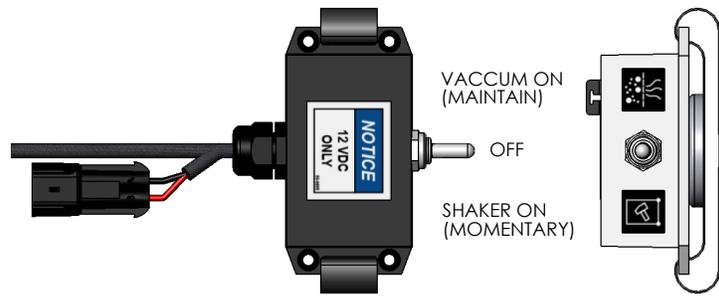
**NOTICE!** *Running shaker while fan is ON will imbed dirt in filter. This will cause extra maintenance and possible damage to filter.*

2. After extended use or from type of material being collected, it may be necessary to remove and clean filter.
3. To clean filter, remove it from the attachment.
4. Place filter in a position that will allow the use of a garden hose to remove debris. DO NOT USE A PRESSURE WASHER OR COMPRESSED AIR.
5. Allow filter to dry before re-installing.
6. Never operate attachment fan without filter.

**NOTICE!** *Do not use container sweeper, bucket broom or vacuum sweeper without filter.*

**NOTICE!** *Attachment is not designed for use with portland cement, lime and grain collection. Contact SWEEPSTER for additional information.*

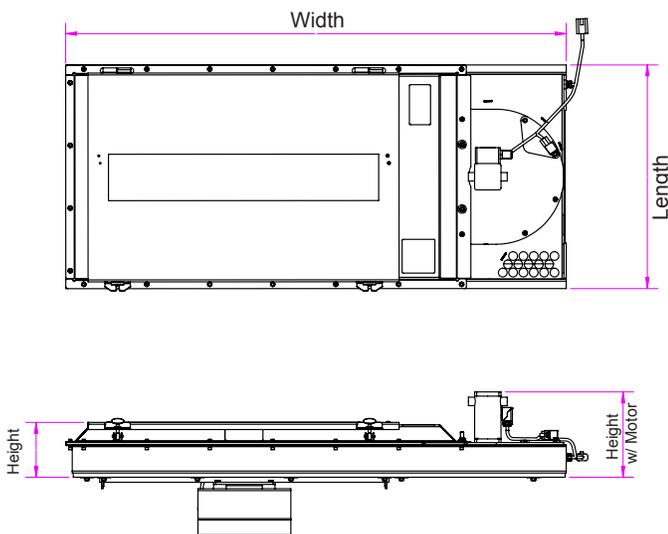
# OPERATION



Switch for Electric Vacuum

# PRODUCT SPECIFICATIONS

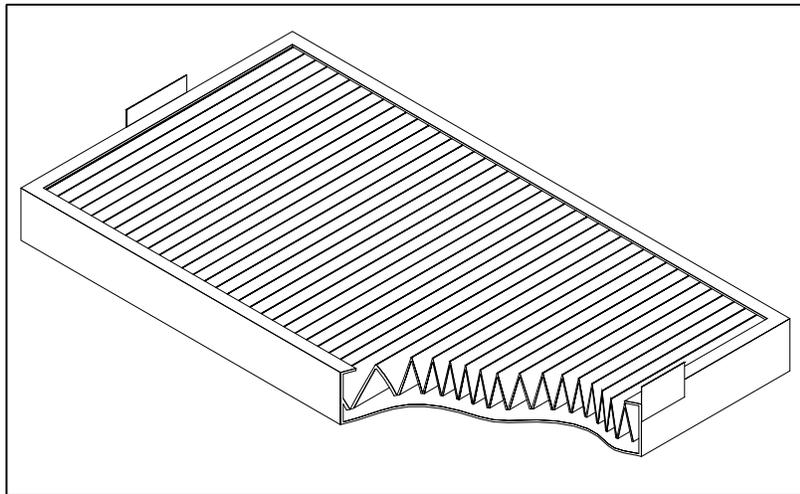
## Specifications and Model Views



Approximate Weight	235 lbs 210 lbs	Hydraulic Electric
Width	59.3 inches	
Length	26.5 inches	
Height	6.5 inches	
Height with Motor	10.1 inches	Electric
Height with Motor	7.6 inches	Hydraulic
Hydraulic Oil Flow	36 gpm	Hydraulic
Maximum Back Pressure	350 psi	Hydraulic
12 VDC	8 amps	Electric

# MAINTENANCE SCHEDULE

Procedure	Before EACH USE	AFTER EACH USE
Hardware - Inspect & Tighten	✓	
Filter - Check & Clean if necessary	✓	
Wash Unit - Remove debris		✓



When replacing filter after cleaning make sure that the handles are pointing up.

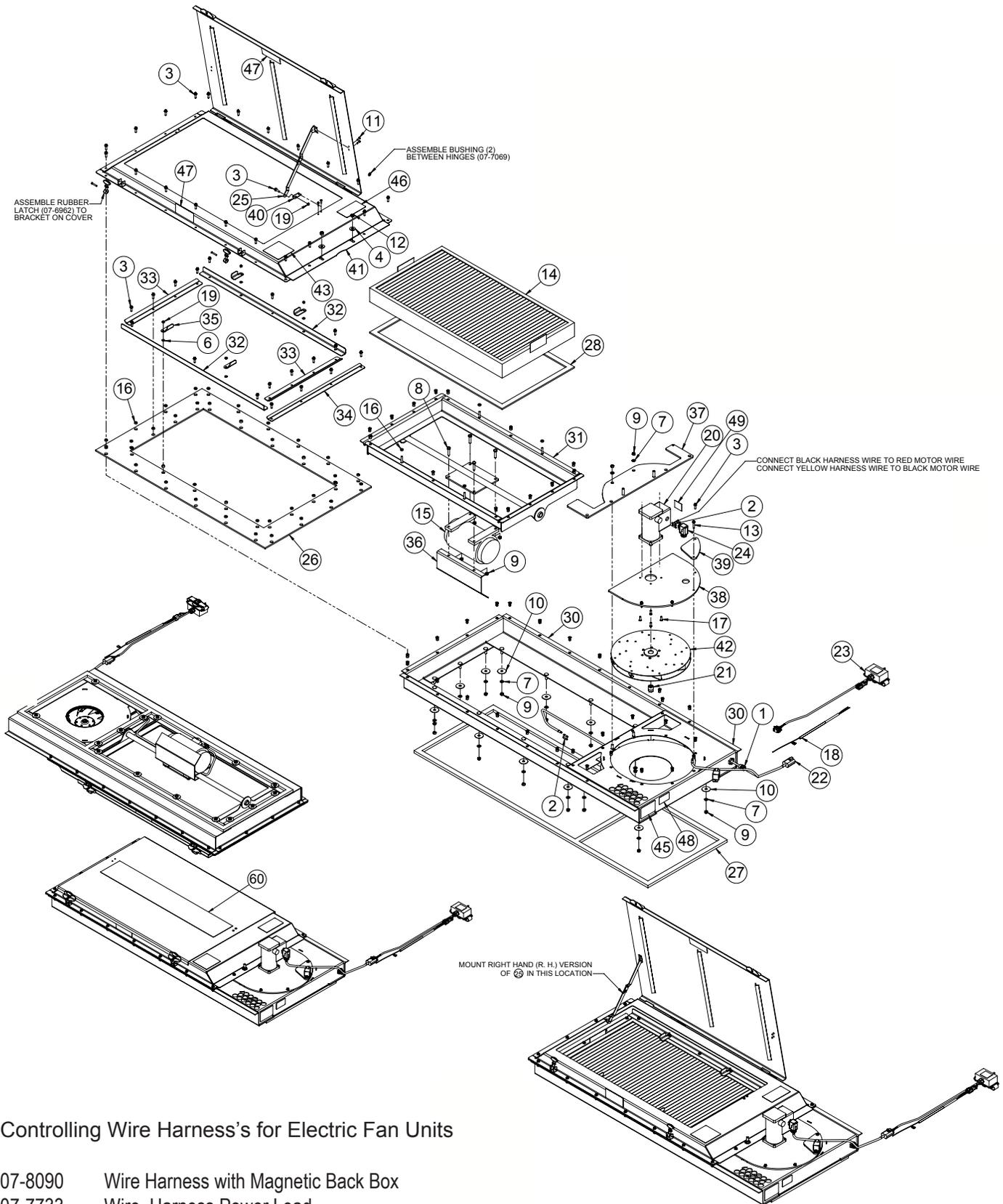
## TROUBLESHOOTING

Problem	Possible Cause	Possible Solution
Fan does not turn	Debris stopping rotation	Remove fan, clean fan housing
	Fuse Failed	Replace Fuse (Electric Version)
Dust escaping from sweeper	Skirting, flaps or seals damaged or mis-adjusted	Refer to sweeper manual for adjustment
Dust escaping from fan exhaust	Filter seal damaged or hole in filter	Remove filter and inspect filter seal and filter for damage. Replace if required.
Filter shaking frequency increasing	Dirty filter	Remove filter and clean with water. (See Service & Repair)
Filter does not shake	12 VDC power source not functioning	Prime mover not providing power or electrical cable cut
	Debris between filter basket and body eliminating shaking	Remove filter, install 1" support between filter basket and body and remove debris

## ELECTRIC VACUUM ATTACHMENT FILTER BOX

Item	Part	Qty	Description
1.	07-0857	1	Strain, Relief, 1/2, .450-.560, Water-Tight
2.	07-0867	4	Terminal Butt, 16-14
3.	07-2952	42	Screw, HFH, CL10.9, M6-1 x 20
4.	07-3279	2	Washer, Flat, Gr8, 3/8
5.	07-3617	42	Nut, Insert, Hex, M6 x 1
6.	07-3728	4	Washer, Flat, CL8.8, M6
7.	07-3736	18	Washer, Flat, CL8.8, M8
8.	07-3741	4	Screw, HHC, CL10.9, M8-1.25 x 35mm
9.	07-4604	22	Nut, Hex, Top-Lock, CL10.9, M8-1.25
10.	07-4942	16	Washer, Fender, 1 1/2 x 5/16
11.	07-5011	4	Rivet, 3/16, .062-.437 Grip
12.	07-5370	2	Nut, Hex, Lock, Gr8, 3/8-16
13.	07-6597	1	Screw, HFH, CL10.9, M6-1 x 30mm
14.	07-6679	1	Filter, Dust Collector
15.	07-6947	1	Vibrator, DC, 12 Volt
	07-8226	1	Vibrator, DC, 24 Volt
16.	07-6963	38	Spacer, Plastic, .5 x .252 x .25
17.	07-7686	4	Screw, BHC, 1/4-20 x 3/4
18.	07-7733	1	Wire Harness, Power Lead, 126 inches
19.	07-7856	5	Nut, Hex, Top-Lock, CL10.9, M6-1
20.	07-8087	1	Motor, Electric, .5 Shaft, 12VDC
	07-8227	1	Motor, Electric, .5 Shaft, 24VDC
21.	07-8088	1	Trantorque, 1/2 x 7/8
22.	07-8089	1	Wire Harness, 9 Ft
23.	07-8090	1	Wire Harness, with Box, for 12VDC
	07-8229	1	Wire Harness, with Box, for 24VDC
24.	07-8091	1	Fitting, Liquid Tight, 90°, 1/2NPT, .20-3.5
25.	07-8113	1	Brace, Foldong, 13.5 Extended
26.	09-0277	1	Gasket, Linatex, 42.2 x 26.5 x 1/4, with Holes
27.	09-0282	15.4ft	Rubber, Neoprene, Blended Foam, 1/2 x 1
28.	09-0283	19ft	Rubber, Neoprene, Blended Foam, 1/4 x 1
29.	13-13973	4	Tube, Round, .5 x .321 x .275
30.	13-14136	1	Weld, Frame, Vacuum
31.	13-14152	1	Weld, Filter Tray
32.	13-14159	2	Plate, Retainer, #1, Gasket, Filter Box
33.	13-14160	2	Plate, Retainer, #2, Gasket, Filter Box
34.	13-14161	1	Plate, Retainer, #3, Gasket, Filter Box
35.	13-14162	4	Plate, Hold Down, Filter
36.	13-15706	1	Plate, Guard, Motor
37.	13-15792	1	Plate, Mounting, Motor
38.	13-17754	1	Plate, Mounting, Motor, Electric
39.	13-17755	1	Plate, Cover
40.	13-17776	1	Bracket, Mounting, Brace
41.	13-17778	1	Weld, Cover, Filter Box
42.	28-10679	1	Assembly, Fan, Balanced, Electric
43.	41043	1	Decal, Warning, Hazardous Dust
44.	50-0252	1	Label, Logo, Large, White, Die Cut
45.	50-0634	1	Label, Serial Number
46.	50-0723	1	Label, Warning, Misuse Hazard
47.	50-0737	2	Label, Warning, Pinch Point Hazard
48.	50-0945	1	Label, Patent, 7,958,596
49.	50-0955	1	Decal, Ansi Notice, 12 VDC

# ELECTRIC VACUUM ATTACHMENT FILTER BOX



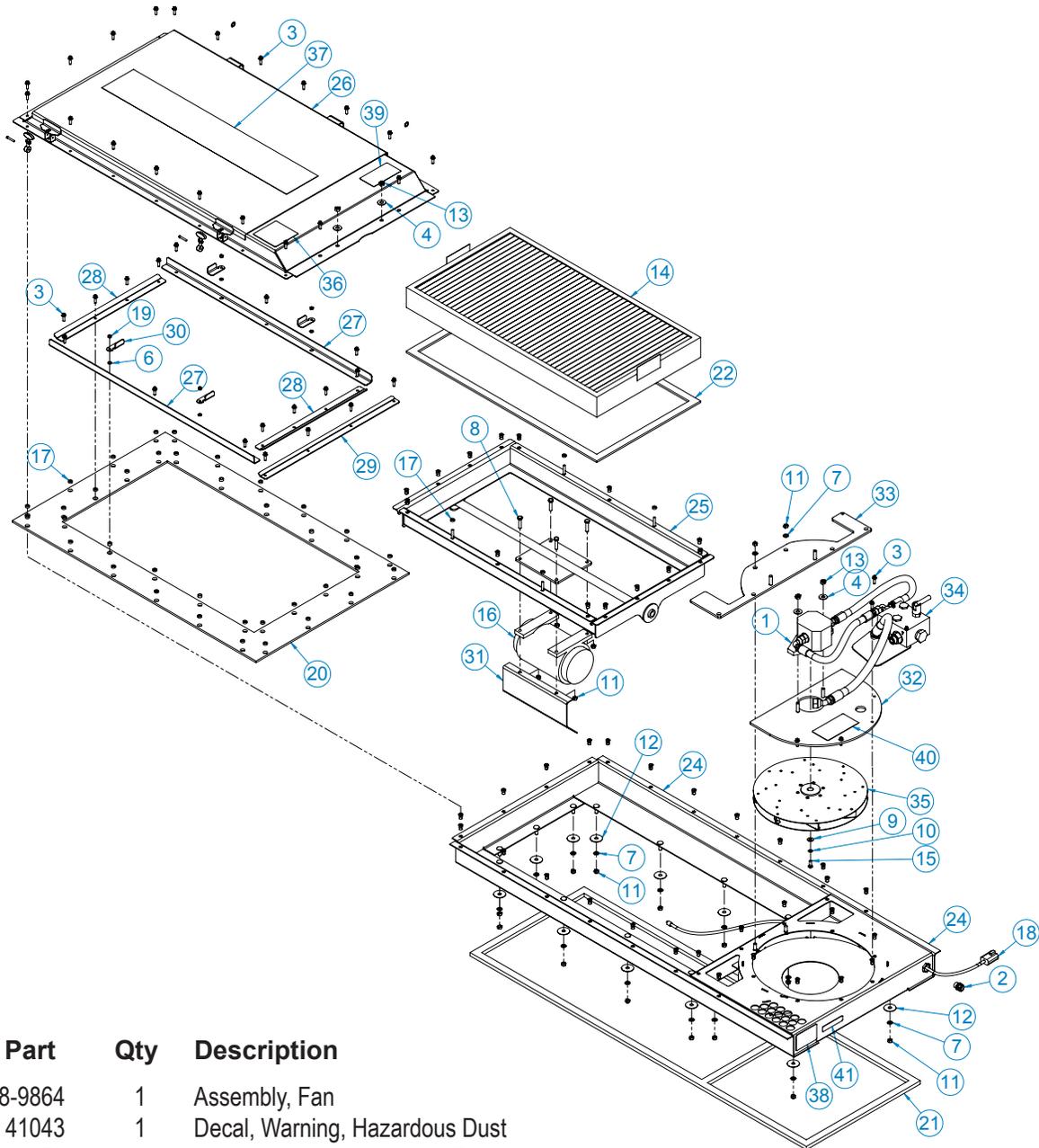
## Controlling Wire Harness's for Electric Fan Units

- 07-8090 Wire Harness with Magnetic Back Box
- 07-7733 Wire Harness Power Lead
- LAF9360 Controlling Wire Harness for Bobcat, Gehl, JCB, Mustang and Volvo Only (14-pin)
- 07-10021 Controlling Wire Harness for CAT (8-pin) Pre-B Series
- 07-10170 Controlling Wire Harness for CAT (8-pin) B & C Series

# HYDRAULIC VACUUM ATTACHMENT FILTER BOX

Item	Part	Qty	Description
1.	03-5030	1	Motor, Hydraulic, 6.0cc (Serial # 0916069 and down)
	03-5515	1	Motor, Hydraulic, 9.6cc (Serial # 0916070 and up)
2.	07-0857	1	Strain, Relief, 1/2, .450-.560, Water-Tight
3.	07-2952	42	Screw, HFH, CL10.9, M6-1 x 20
4.	07-3279	4	Washer, Flat, Gr8, 3/8
5.	07-3617	42	Nut, Insert, Hex, M6 x 1
6.	07-3728	4	Washer, Flat, CL8.8, M6
7.	07-3736	18	Washer, Flat, CL8.8, M8
8.	07-3741	4	Screw, HHC, CL10.9, M8-1.25 x 35mm
9.	07-4032	1	Washer, Flat, Gr8, 1/4
10.	07-4038	1	Washer, Lock, Split, Medium, 1/4
11.	07-4604	22	Nut, Hex, Top-Lock, CL10.9, M8-1.25
12.	07-4942	16	Washer, Fender, 1 1/2 x 5/16
13.	07-5370	4	Nut, Hex, Lock, Gr8, 3/8-16
14.	07-6679	1	Filter, Dust Collector
15.	07-6925	1	Screw, HHC, Gr8, 1/4-28 x 3/4
16.	07-6947	1	Vibrator, DC, 12 Volt
17.	07-6963	38	Spacer, Plastic, .5 x .252 x .25
18.	07-7029	1	Wire, Harness, 9 Ft, for Vibrator (See Chart for Correct Controlling Wire Harness for Prime Mover)
19.	07-7856	4	Nut, Hex, Top-Lock, CL10.9, M6-1
20.	09-0277	1	Gasket, Linatex, 42.2 x 26.5 x 1/4, with Holes
21.	09-0282	15.4ft	Rubber, Neoprene, Blended Foam, 1/2 x 1
22.	09-0283	19ft	Rubber, Neoprene, Blended Foam, 1/4 x 1
23.	13-13973	4	Tube, Round, .5 x .321 x .275
24.	13-14136	1	Weld, Frame, Vacuum
25.	13-14152	1	Weld, Filter Tray
26.	13-14157	1	Weld, Cover, Filter Box
27.	13-14159	2	Plate, Retainer, #1, Gasket, Filter Box
28.	13-14160	2	Plate, Retainer, #2, Gasket, Filter Box
29.	13-14161	1	Plate, Retainer, #3, Gasket, Filter Box
30.	13-14162	4	Plate, Hold Down, Filter
31.	13-15706	1	Plate, Guard, Motor
32.	13-15790	1	Weld, Plate, Mounting, Motor
33.	13-15792	1	Plate, Mounting, Motor
34.	28-10415	1	Kit, Hydraulic, Vacuum
	03-3180	2	Fitting, 10MF-12MB
	03-3318	1	Elbow, 90°, 8MB-8MF
	03-3481	2	Fitting, 8MF-10MB (Serial #0916069 and down)
	03-3481	1	Fitting, 8MF-10MB (Serial #0916070 and up)
	03-3514	1	Fitting, 8MB-8MF
	03-3515	1	Fitting, 8MF-12MB (Serial #0916070 and up)
	03-5234	1	Hose, .63 x 46, 10FF45-10FF90, 2.75K
	03-5321	2	Hose, .5 x 16, 8FF-8FF90, 4K
	03-5409	1	Manifold, Flow Divider
	07-3644	2	Screw, HHC, Gr8, 1/4-20 x 3
	07-5824	2	Nut, Hex, Lock, Gr8, 1/4-20
	13-15518	1	Plate, Mounting, Valve Fan

# HYDRAULIC VACUUM ATTACHMENT FILTER BOX



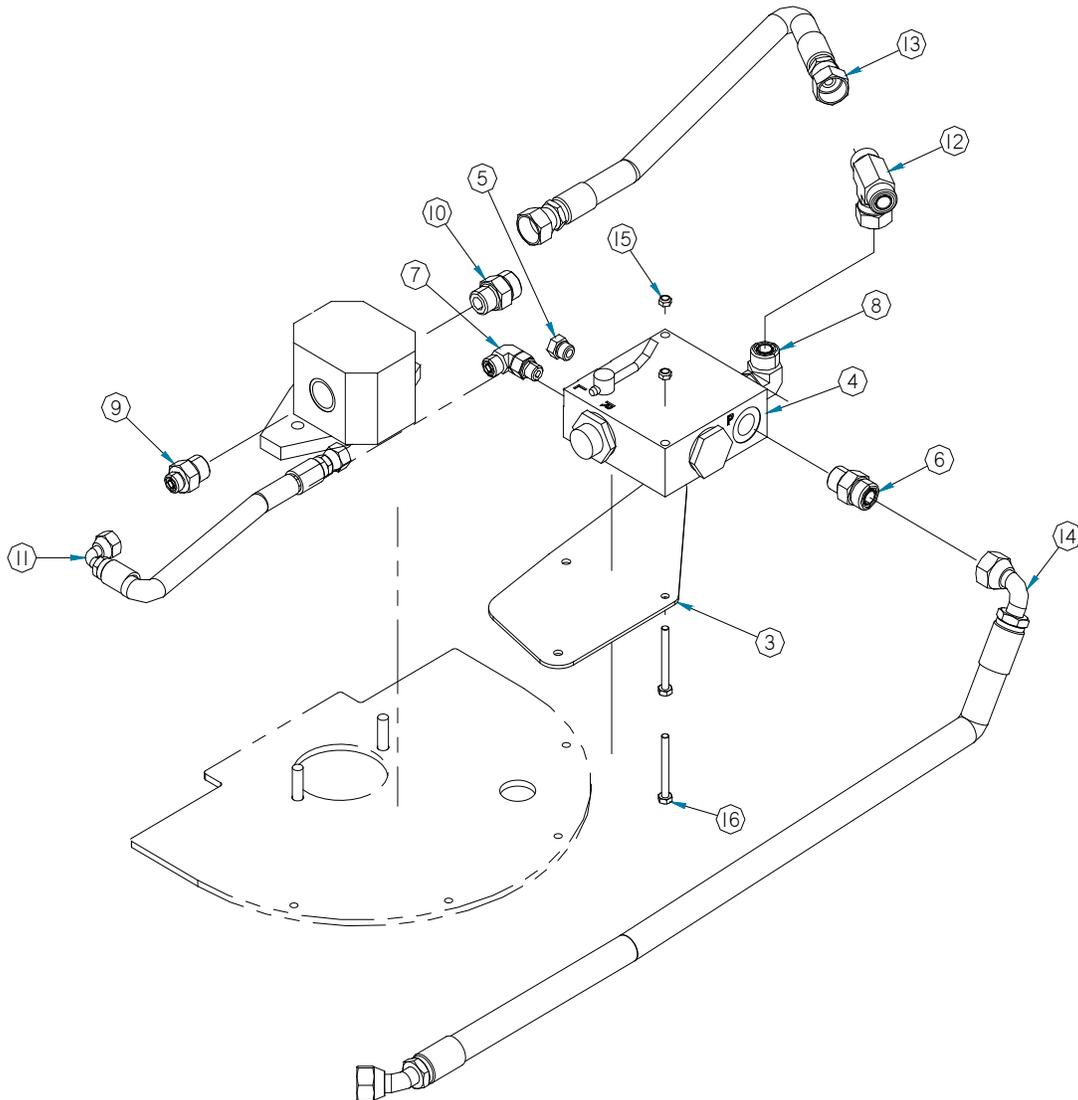
Item	Part	Qty	Description
35.	28-9864	1	Assembly, Fan
36.	41043	1	Decal, Warning, Hazardous Dust
37.	50-0252	1	Label, Logo, Large, White, Die Cut
38.	50-0634	1	Label, Serial Number
39.	50-0723	1	Label, Warning, Misuse Hazard
40.	50-0725	1	Label, Warning, High Pressure Fluid Hazard
41.	50-0945	1	Label, Patent, 7,958,596

## Controlling Wire Harness's for Hydraulic Fan Units

LAF9444	Wire Harness with Magnetic Back Box
LAF9360	Controlling Wire Harness for Bobcat, Case and New Holland (14-pin)
LAF9393	Controlling Wire Harness for Case (8-pin)
LAF9361	Controlling Wire Harness for John Deere (14-pin)
07-10057	Controlling Wire Harness for Komatsu (8-pin)
07-10021	Controlling Wire Harness for CAT (8-pin)

# HYDRAULIC ASSEMBLY

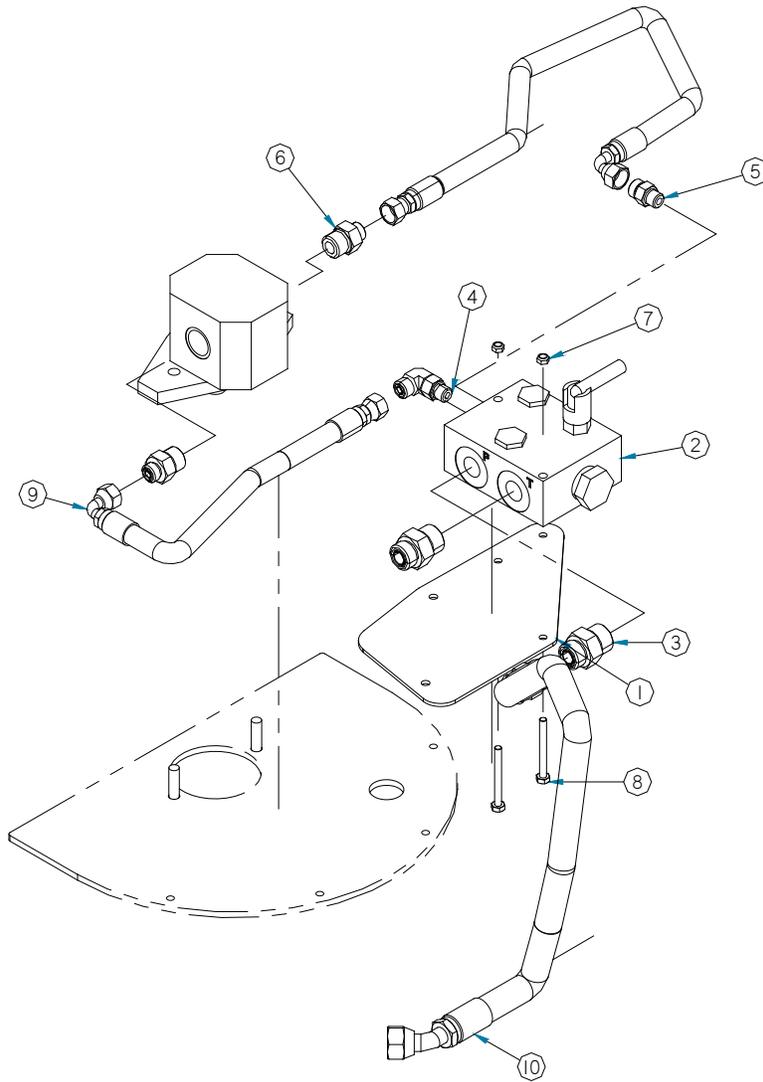
Assembly 28-10047



Item	Part	Qty	Description
3.	13-15518	1	Plate, Mounting, Valve, Fan
4.	03-4490	1	Manifold, Free Reverse Flow
5.	03-1613	1	Fitting, Plug, HP, Hex, 9/16MOR
6.	03-1939	1	Fitting, Adapter, HP, 7/8MOR, 5/8MFS
7.	03-2092	1	Fitting, Elbow, HP, 90°, 9/16MOR, 3/8MFS
8.	03-2126	1	Fitting, Elbow, HP, 90°, 7/8MOR, 5/8MFS
9.	03-2564	1	Fitting, Adapter, HP, 3/8MFS, 7/8MOR
10.	03-5230	1	Fitting, Adapter, Check, 10MOR, 10MFS, 5000psi
11.	03-5232	1	Hose, 3/8 x 16, 2W, 6FFS, 6FFS90
12.	03-4372	1	Fitting, Tee, HP, 5/8MFS, 5/8MFS
13.	03-5233	1	Hose, 1/2 x 24, 10FFS, 10FFS
14.	03-5234	1	Hose, 5/8 x 46, 10FFS45, 10FFS90 @270
15.	07-5824	2	Nut, Hex, Lock, Gr8, 1/4-20
16.	07-3642	2	Screw, HHC, Gr8, 1/4-20 x 2 1/2

# HYDRAULIC ASSEMBLY

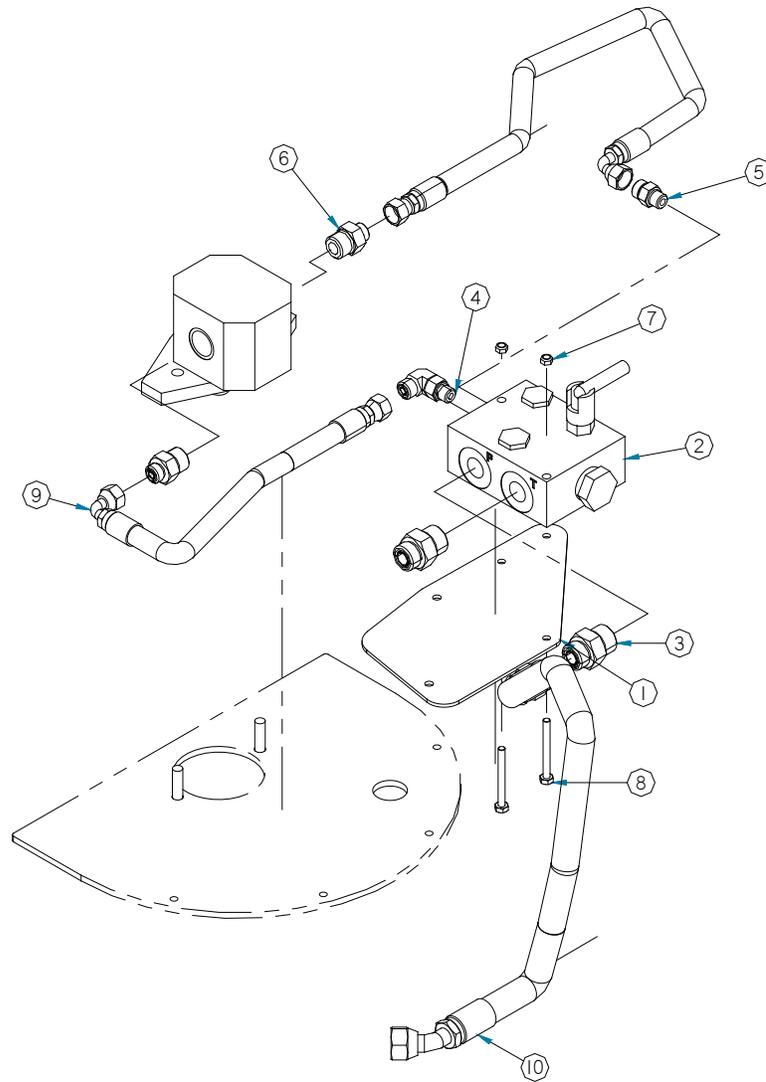
Assembly 28-10078



Item	Part	Qty	Description
1.	13-15518	1	Plate, Mounting, Valve, Fan
2.	03-5265	1	Manifold, Valve, Flow Divider, with Check
3.	03-3180	2	Fitting, Adapter, HP, 5/8MFS, 1 1/16MOR
4.	03-2092	1	Fitting, Elbow, HP, 90°, 9/16MOR, 3/8MFS
5.	03-2291	1	Fitting, Adapter, HP, 3/8MFS, 9/16MOR
6.	03-2564	1	Fitting, Adapter, HP, 3/8MFS, 7/8MOR
7.	07-5824	2	Nut, Hex, Lock, Gr8, 1/4-20
8.	07-3642	2	Screw, HHC, Gr8, 1/4-20 x 2 1/2
9.	03-5232	2	Hose, 3/8 x 16, 2W, 6FFS, 6FFS90
10.	03-5234	1	Hose, 5/8 x 46, 10FFS45, 10FFS90@270

# HYDRAULIC ASSEMBLY

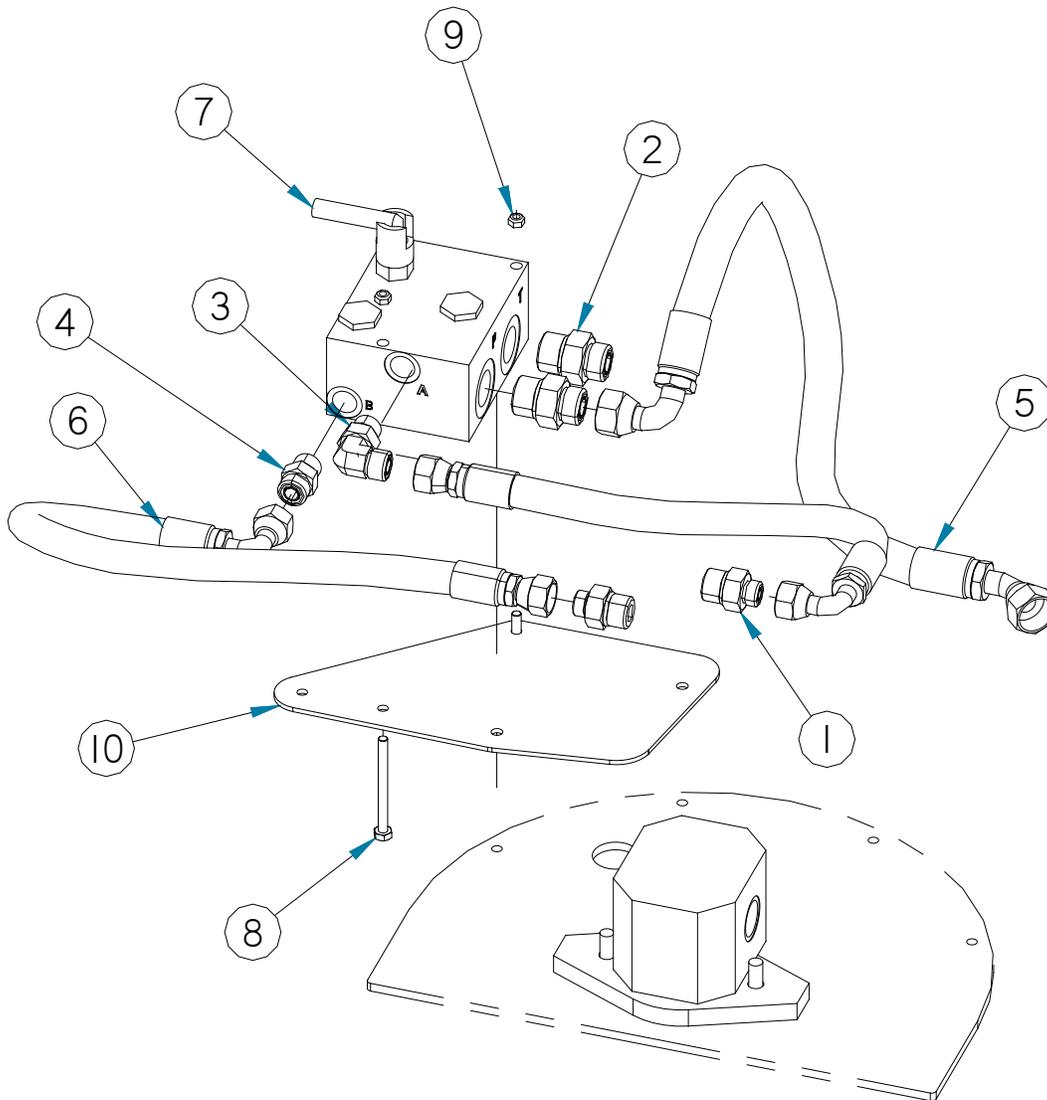
Assembly 28-10090



Item	Part	Qty	Description
1.	13-15518	1	Plate, Mounting, Valve, Fan
2.	03-5288	1	Manifold, Flow Divider, with Check
3.	03-3180	2	Fitting, Adapter, HP, 5/8MFS, 1 1/16MOR
4.	03-3318	1	Fitting, Elbow, HP, 90°, 3/4MOR, 1/2MFS
5.	03-3514	1	Fitting, Adapter, HP, 8MFS, 8MOR
6.	03-2564	1	Fitting, Adapter, HP, 3/8MFS, 7/8MOR
7.	07-5824	2	Nut, Hex, Lock, Gr8, 1/4-20
8.	07-3644	2	Screw, HHC, Gr8, 1/4-20 x 3
9.	03-5321	2	Hose, 1/2 x 16, 2W, 8FFS, 8FFS90
10.	03-5234	1	Hose, 5/8 x 46, 10FFS45, 10FFS90@270

# HYDRAULIC ASSEMBLY

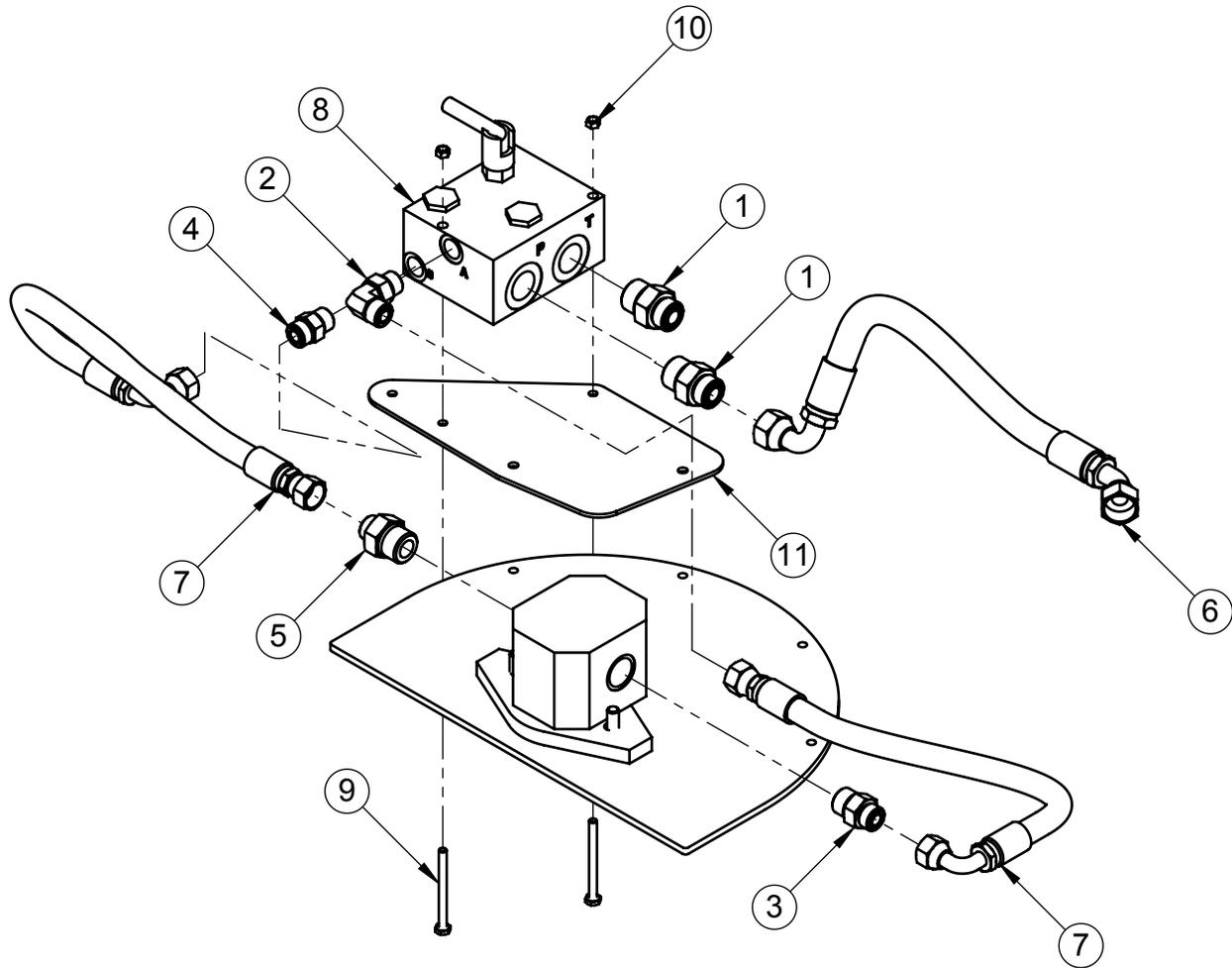
Assembly 28-10155



Item	Part	Qty	Description
1.	03-2564	2	Fitting, Adapter, HP, 3/8MFS, 7/8MOR
2.	03-3180	2	Fitting, Adapter, HP, 5/8MFS, 1 1/16MOR
3.	03-3318	1	Fitting, Elbow, HP, 90°, 3/4MOR, 1/2MFS
4.	03-3514	1	Fitting, Adapter, HP, 8MFS, 8MOR
5.	03-5234	1	Hose, 5/8 x 46, 10FFS45, 10FFS90@270
6.	03-5321	2	Hose, 1/2 x 16, 2W, 8FFS, 8FFS90
7.	03-5409	1	Manifold, Valve, Flow Divider, with Check and Relief
8.	07-3644	2	Screw, HHC, Gr8, 1/4-20 x 3
9.	07-5824	2	Nut, Hex, Lock, Gr8, 1/4-20
10.	13-15518	1	Plate, Mounting, Valve, Fan

# HYDRAULIC ASSEMBLY

Assembly 28-10415



Item	Part	Qty	Description
1.	03-3180	2	Fitting, Adapter, HP, 5/8MFS, 1 1/16MOR
2.	03-3318	1	Fitting, Elbow, HP, 90°, 3/4MOR, 1/2MFS
3.	03-3481	1	Fitting, 10MB-8MF
4.	03-3514	1	Fitting, Adapter, HP, 8MFS, 8MOR
5.	03-3515	1	Fitting, 12MB-8MF
6.	03-5234	1	Hose, 5/8 x 46, 10FFS45, 10FFS90@270
7.	03-5321	2	Hose, 1/2 x 16, 2W, 8FFS, 8FFS90
8.	03-5409	1	Manifold, Valve, Flow Divider, with Check and Relief
9.	07-3644	2	Screw, HHC, Gr8, 1/4-20 x 3
10.	07-5824	2	Nut, Hex, Lock, Gr8, 1/4-20
11.	13-15518	1	Plate, Mounting, Valve, Fan

# BOLT TORQUE SPECIFICATIONS

## GENERAL TORQUE SPECIFICATION TABLES

Use the following charts when determining bolt torque specifications when special torques are not given. Always use grade 5 or better when replacing bolts.

## SAE BOLT TORQUE SPECIFICATIONS

**NOTE:** The following torque values are for use with extreme pressure lubricants, plating or hard washer applications. Increase torque 15% when using hardware that is unplated and either dry or lubricated with engine oil.

Bolt Size		SAE GRADE 5 TORQUE				SAE GRADE 8 TORQUE				Bolt head identification marks as per grade. NOTE: Manufacturing Marks Will Vary
		Pounds Feet		Newton-Meters		Pounds Feet		Newton-Meters		
Inches	Millimeters	UNC	UNF	UNC	UNF	UNC	UNF	UNC	UNF	
1/4	6.35	8	9	11	12	10	13	14	18	
5/16	7.94	14	17	19	23	20	25	27	34	
3/8	9.53	30	36	41	49	38	46	52	62	
7/16	11.11	46	54	62	73	60	71	81	96	
1/2	12.70	68	82	92	111	94	112	127	152	
9/16	14.29	94	112	127	152	136	163	184	221	
5/8	15.88	128	153	174	207	187	224	254	304	
3/4	19.05	230	275	312	373	323	395	438	536	
7/8	22.23	340	408	461	553	510	612	691	830	
1	25.40	493	592	668	803	765	918	1037	1245	
1-1/8	25.58	680	748	922	1014	1088	1224	1475	1660	
1-1/4	31.75	952	1054	1291	1429	1547	1700	2097	2305	
1-3/8	34.93	1241	1428	1683	1936	2023	2312	2743	3135	
1-1/2	38.10	1649	1870	2236	2535	2686	3026	3642	4103	

**GRADE 2**



**GRADE 5**



**GRADE 8**



## METRIC BOLT TORQUE SPECIFICATIONS

**NOTE:** The following torque values are for use with metric hardware that is unplated and either dry or lubricated with engine oil. Reduce torque 15% when using hardware that has extreme pressure lubricants, plating or hard washer applications.

Bolt head identification marks as per grade.		
		

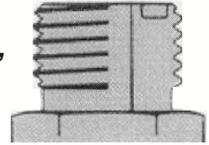
Size of Bolt	Grade No.	Pitch (mm)	Pounds Feet	Newton-Meters	Pitch (mm)	Pounds Feet	Newton-Meters
M6	5.6	1.0	3.6-5.8	4.9-7.9	-	-	-
	8.8		5.8-4	7.9-12.7		-	-
	10.9		7.2-10	9.8-13.6		-	-
M8	5.6	1.25	7.2-14	9.8-19	1.0	12-17	16.3-23
	8.8		17-22	23-29.8		19-27	25.7-36.6
	10.9		20-26	27.1-35.2		22-31	29.8-42
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

**NOTE** - Nylock nuts are utilized when greater resistance to vibrating loose is required, and greater operating temperatures are not a factor. In addition, like lock nuts, nylock nuts have a safety feature that if the bolt does vibrate loose, the nut will remain on the screw. Install nylock nuts to the standard torque shown above.

# HYDRAULIC TORQUE SPECIFICATIONS

## Face Seal: Assembly, Tube to Fitting

**NOTICE!** *Face seal fittings have the most reliable sealing method and therefore, should be used whenever possible.*



## Installation

1. Make sure threads and sealing surfaces are free of burrs, nicks, scratches, or foreign materials.
2. Install proper SAE O-ring to end of fitting if not already installed. Ensure O-ring is fully seated and retained properly.
3. Lubricate O-ring with a light coating of clean hydraulic oil.
4. Position tube and nut squarely on face seal of fitting and tighten nut finger tight.
5. Using appropriate torquing device, tighten to given torque rating from the table below.

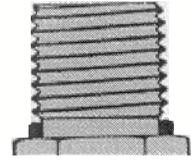
## Torque Values

SAE Dash Size	Tube Side Thread Size	Ft-lbs	N-m
-4	9/16 - 18	18 ± 1	24 ± 1.4
-6	11/16 - 16	27 ± 2	37 ± 2.7
-8	13/16 - 16	40 ± 2	54 ± 4
-10	1 - 14	63 ± 3	85 ± 5.4
-12	1 3/16 - 12	90 ± 4	122 ± 10.8
-16	1 7/16 - 12	120 ± 8	163 ± 10.8
-20	1 11/16 - 12	140 ± 8	190 ± 10.8
-24	2 - 12	165 ± 8	224 ± 10.8

# HYDRAULIC TORQUE SPECIFICATIONS

## Straight Thread O-ring Fitting: Assembly, Fitting to Port

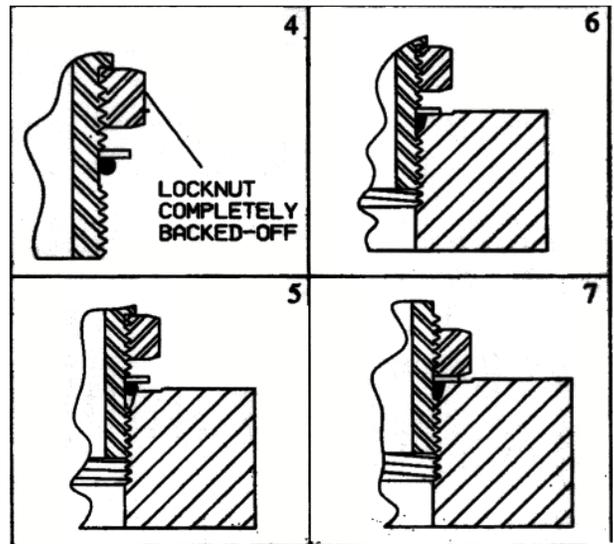
**NOTE -** Straight thread o-ring fittings are utilized to adapt hydraulic systems to motors, pumps, cylinders, and valves.



## Installation (Adjustable Fitting)

1. Make sure threads and sealing surfaces are free of burrs, nicks, scratches, or any foreign materials.
2. Install proper SAE o-ring on port end of fitting if not already installed. Ensure o-ring is fully seated and retained properly.
3. Lubricate o-ring with a light coating of clean hydraulic oil.
4. Back off nut as far as possible and push washer up as far as possible. (figure 4 & 5)
5. Screw fitting into port. Hand tighten fitting until backup washer contacts face of port. (figure 6)
6. To position the fitting, unscrew to desired position, but not more than one full turn.
7. Hold fitting in position with wrench. Using appropriate torquing device, tighten nut to given torque rating from table. (figure 7)

Fitting Size	SAE Port Thread Size	Ft-lbs	N-m
-4	7/16 - 20	16 ± 1	22 ± 1.4
-6	9/16 - 18	35 ± 1	48 ± 1.4
-8	3/4 - 14	60 ± 2	81 ± 2.7
-10	7/8 - 14	105 ± 5	142 ± 6.8
-12	1 1/16 - 12	140 ± 6	190 ± 8.1
-16	1 5/16 - 12	210 ± 8	285 ± 10.8
-20	1 5/8 - 12	260 ± 12	353 ± 16.3
-24	1 7/8 - 12	315 ± 12	427 ± 16.3



# WARRANTY

## 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<sup>1</sup>, 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.**

<sup>1</sup>Attachment Technologies Inc., a subsidiary of Paladin Brands Holding, Inc. (PBHI) is referred to herein as Paladin Light Construction.