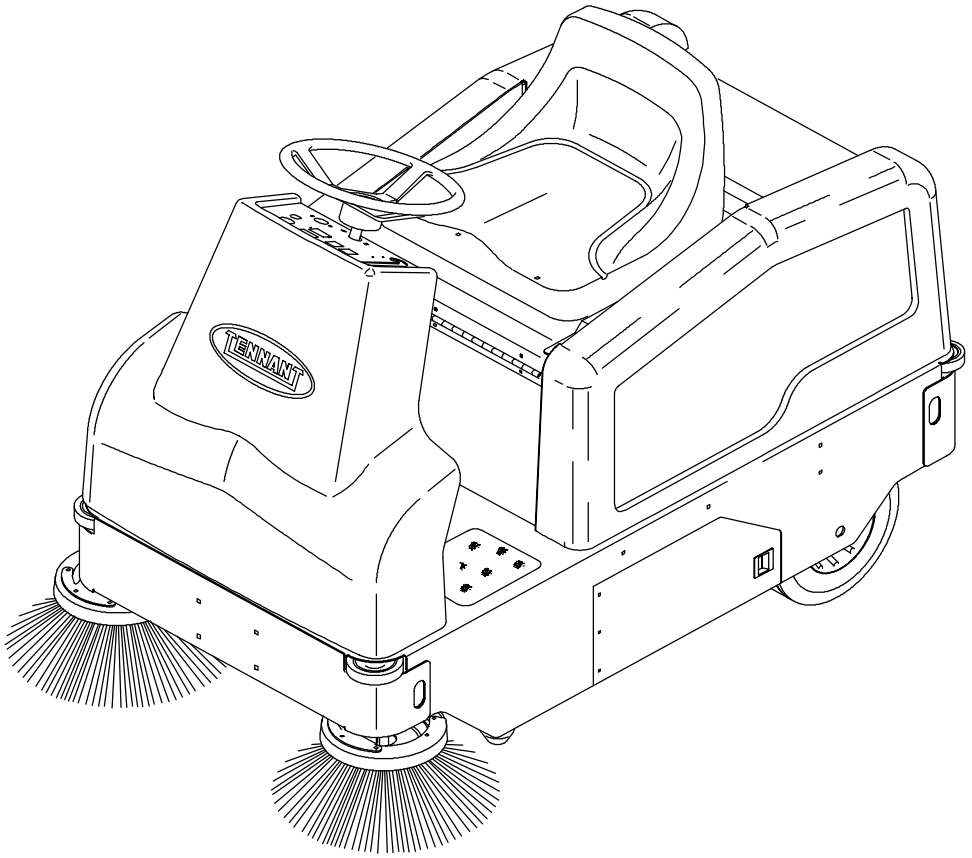
6100 G/LP

Service Manual



330235
Rev. 02 (9-01)

This service manual is intended to be used as an aid in the detailed service, repair, and troubleshooting of your TENNANT Model 6100 G/LP.

The set is organized into six major groups: General Information, Chassis, Sweeping, Electrical, Hydraulics, and Engine–G/LP.

General Information: Safety precautions, machine specifications, machine maintenance chart, machine tieing, machine jacking, machine storing, machine pushing or towing, and hardware information.

Chassis: Tire/wheel replacement, brake adjustment and replacement, steering adjustment and replacement.

Sweeping: Hopper repair/replacement, brush repair/replacement, skirt/seal repair/replacement, and sweeping troubleshooting.

Electrical: Battery maintenance and replacement, electrical schematics, and electrical troubleshooting.

Hydraulics: Valve replacement, motor replacement/repair, cylinder replacement/repair, pump replacement/repair, filter replacement, hydraulic schematic, and hydraulic troubleshooting.

Engine – G/LP: Air filter replacement, oil changing, cooling system maintenance/repair, engine troubleshooting, engine removal, and engine repairs.

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CONTENTS

SAFETY PRECAUTIONS

The following symbols are used throughout this manual as indicated in their description:

WARNING: To warn of hazards or unsafe practices that could result in severe personal injury or death.

FOR SAFETY: To identify actions that must be followed for safe operation of equipment.

The machine is suited to sweep disposable debris. Do not use the machine other than described in this Operator Manual. The machine is not designed for use on public roads.

The following information signals potentially dangerous conditions to the operator or equipment:

FOR SAFETY:

1. **Do not operate machine:**
   - **Unless trained and authorized.**
   - **Unless operation manual is read and understood.**
   - **In flammable or explosive areas unless designed for use in those areas.**
   - **In areas with possible falling objects unless equipped with overhead guard.**

2. **Before starting machine:**
   - **Check for fuel leaks.**
   - **Keep sparks and open flame away from refueling area.**
   - **Make sure all safety devices are in place and operate properly.**
   - **Check brakes and steering for proper operation.**

3. **When starting machine:**
   - **Keep foot on brake and directional pedal in neutral.**

4. **When using machine:**
   - **Use brakes to stop machine.**
   - **Go slowly on inclines and slippery surfaces.**
   - **Use care when reversing machine.**
   - **Do not carry riders on machine.**
   - **Always follow safety and traffic rules.**
   - **Report machine damage or faulty operation immediately.**

5. **Before leaving or servicing machine:**
   - **Stop on level surface.**
   - **Set parking brake.**
   - **Turn off machine and remove key.**

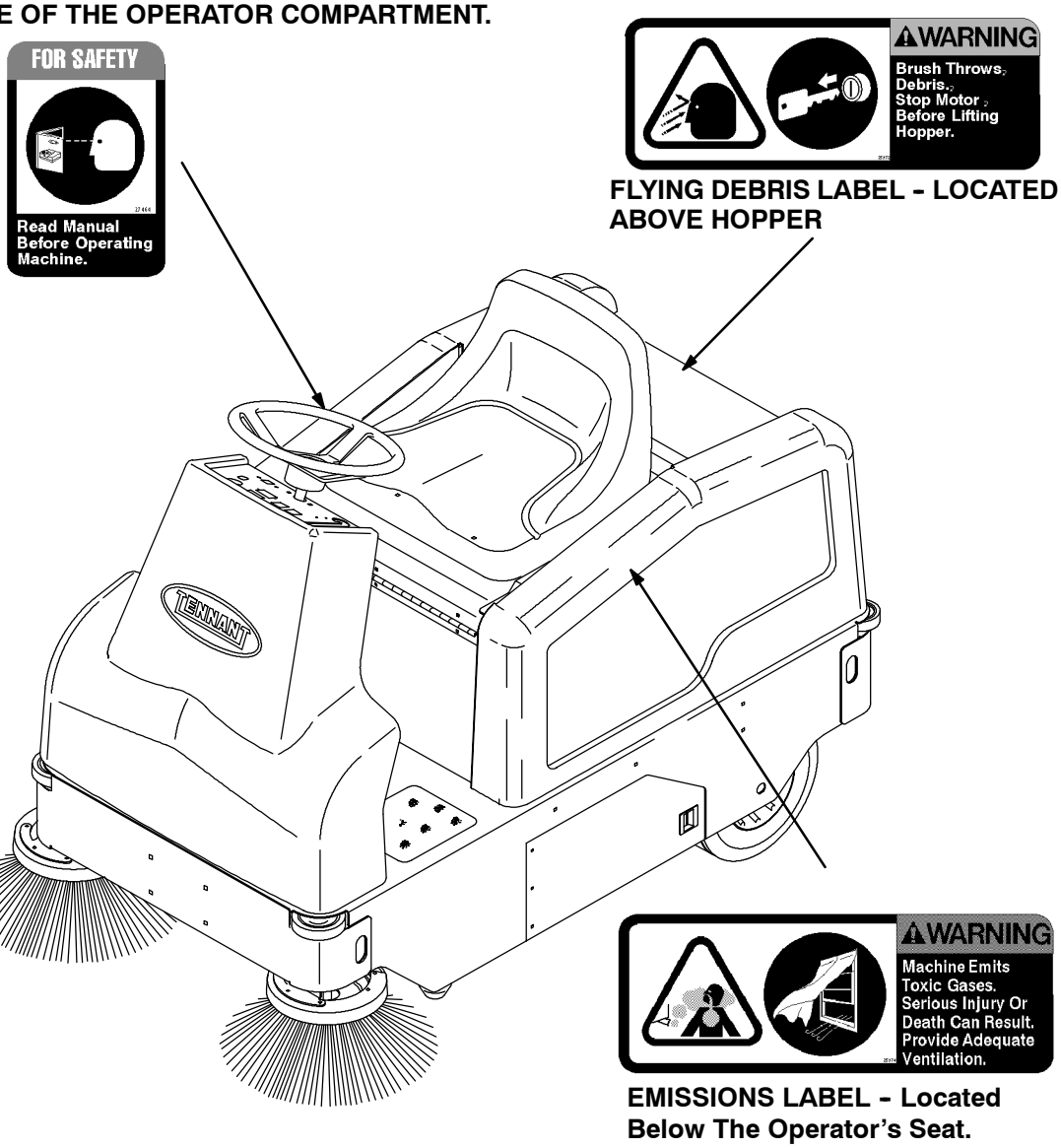
6. **When servicing machine:**
   - **Avoid moving parts. Do not wear loose jackets, shirts, or sleeves when working on machine.**
   - **Block machine tires before jacking up machine.**
   - **Jack up machine at designated locations only. Block machine up with jack stands.**
   - **Use hoist or jack of adequate capacity to lift machine.**
   - **Wear eye and ear protection if using pressurized air or water.**
   - **Disconnect battery connections before working on machine.**
   - **Avoid contact with battery acid.**
   - **Use cardboard to locate leaking hydraulic fluid under pressure.**
   - **Use Tennant supplied or equivalent replacement parts.**

WARNING: Engine emits toxic gases. Severe respiratory damage or asphyxiation can result. Provide adequate ventilation. Consult with your regulatory authorities for exposure limits. Keep engine properly tuned.

WARNING: Brush throws debris. Stop motor before lifting hopper.

The following safety labels are mounted on the machine in the locations indicated. If these or any labels become damaged or illegible, install a new label in its place.

FOR SAFETY LABEL - LOCATED ON THE SIDE OF THE OPERATOR COMPARTMENT.



FLYING DEBRIS LABEL - LOCATED ABOVE HOPPER

EMISSIONS LABEL - Located Below The Operator's Seat.

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SPECIFICATIONS

GENERAL MACHINE DIMENSIONS/CAPACITIES

Item	Dimension/capacity	
Length	1520 mm	(60 in)
Width	805 mm	(32 in)
Height	1180 mm	(46 in)
Track	880 mm	(35 in)
Wheelbase	682 mm	(27 in)
Main sweeping brush diameter	280 mm	(11 in)
Main sweeping brush length	560 mm	(22 in)
Side brush diameter	406 mm	(16 in)
Sweeping path width	560 mm	(22 in)
Sweeping path width with one side brush	762 mm	(30 in)
Sweeping path width with two side brushes	965 mm	(38 in)
Main sweeping brush pattern width	50 mm	(2 in)
Hopper weight capacity	90 kg	(200 lb)
Hopper volume capacity	85 L	(3 cu ft)
Dust filter area	3.2 sq m	(34 sq ft)
GVWR	2041 kg	(1009 lb)

GENERAL MACHINE PERFORMANCE

Item	Measure	
Maximum forward speed	8 km/h	(5 mph)
Maximum reverse speed	4.8 km/h	(3 mph)
Minimum aisle turn	1830 mm	(72 in)
Minimum turning radius	1725 mm	(68 in)
Maximum rated incline with empty hopper	10° / 17.6%	
Maximum rated incline with full hopper	8° / 14.1%	

POWER TYPE

Engine	Type	Ignition	Cycle	Aspiration	Cylinders	Bore	Stroke
Robin	Piston	Breakerless-type spark	4	Natural	1	84 mm (3.31 in)	61 mm (2.40 in)
	Displacement		Net power, governed			Net power, maximum	
	338 cc (20.63 cu in)		5.4 kw (7.5 hp) @ 2200 rpm			8.2 kw (11 hp) @ 3600 rpm	
	Fuel		Cooling system			Electrical system	
	Gasoline, 87 octane minimum, unleaded. Fuel tank: 6 L (1.5 gal)		Air cooled			12 V nominal	
	LPG, Fuel tank: 9 kg (20 lb) Vapor					12.5 A alternator	
	Idle speed		(Fast) governed speed			Firing order	
	2200 rpm (gov)		2200 rpm (gov)				
	Spark plug gap		Valve clearance, cold			Engine lubricating oil with filter	
	1 mm (0.043 in)		0.145 to 0.185 mm (0.0057 to 0.0072 in) intake and exhaust			1.20 L (1.27 qt) 10W30 SAE-SG/SH	

STEERING

Type	Power source	Emergency steering
Front wheel, manual controlled	Manual steering	Manual

HYDRAULIC SYSTEM

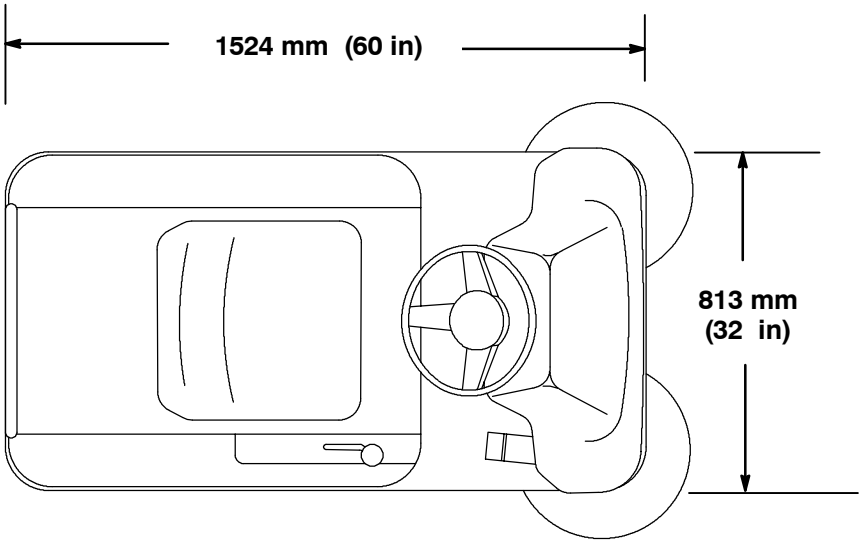
System	Capacity	Fluid Type
Hydraulic reservoir		TENNANT part no. 65869-above 7° C (45° F)
Hydraulic total		TENNANT part no. 65870-above 7° C (45° F)

BRAKING SYSTEM

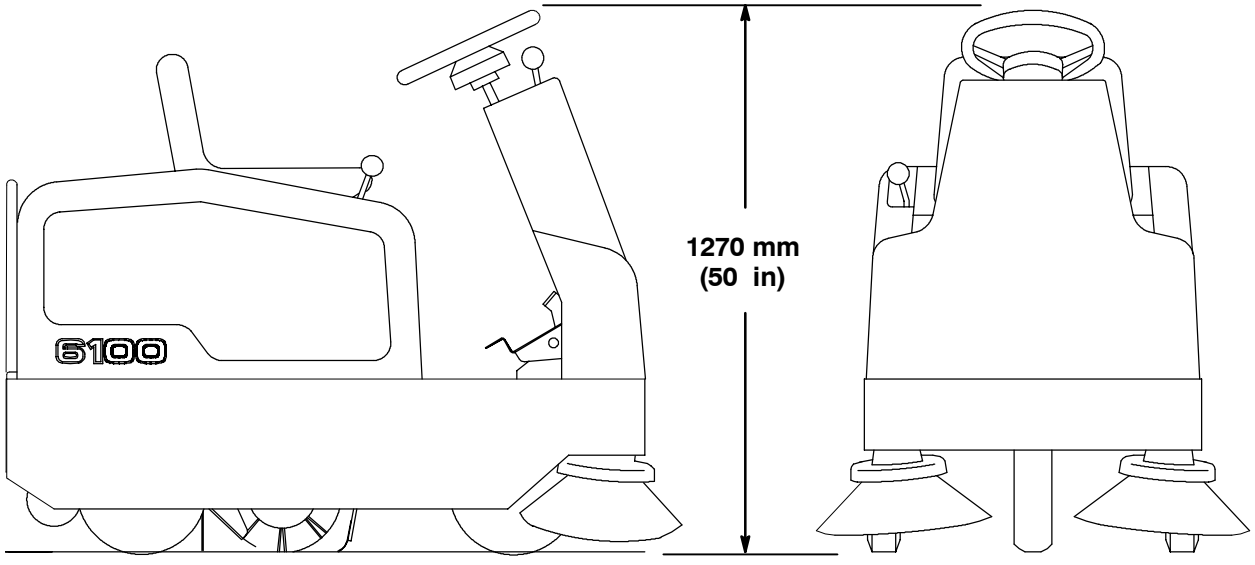
Type	Operation
Service brakes	Mechanical disc brake (1), one front wheel, cable actuated
Parking brake	Utilizes service brakes, cable actuated

TIRES

Location	Type	Size
Front (1)	Solid	90 x 305 mm (3.5 in x12 in OD)
Rear (2)	Solid	76 x 305 mm (3 in x 12 in OD)



TOP VIEW



SIDE VIEW

FRONT VIEW

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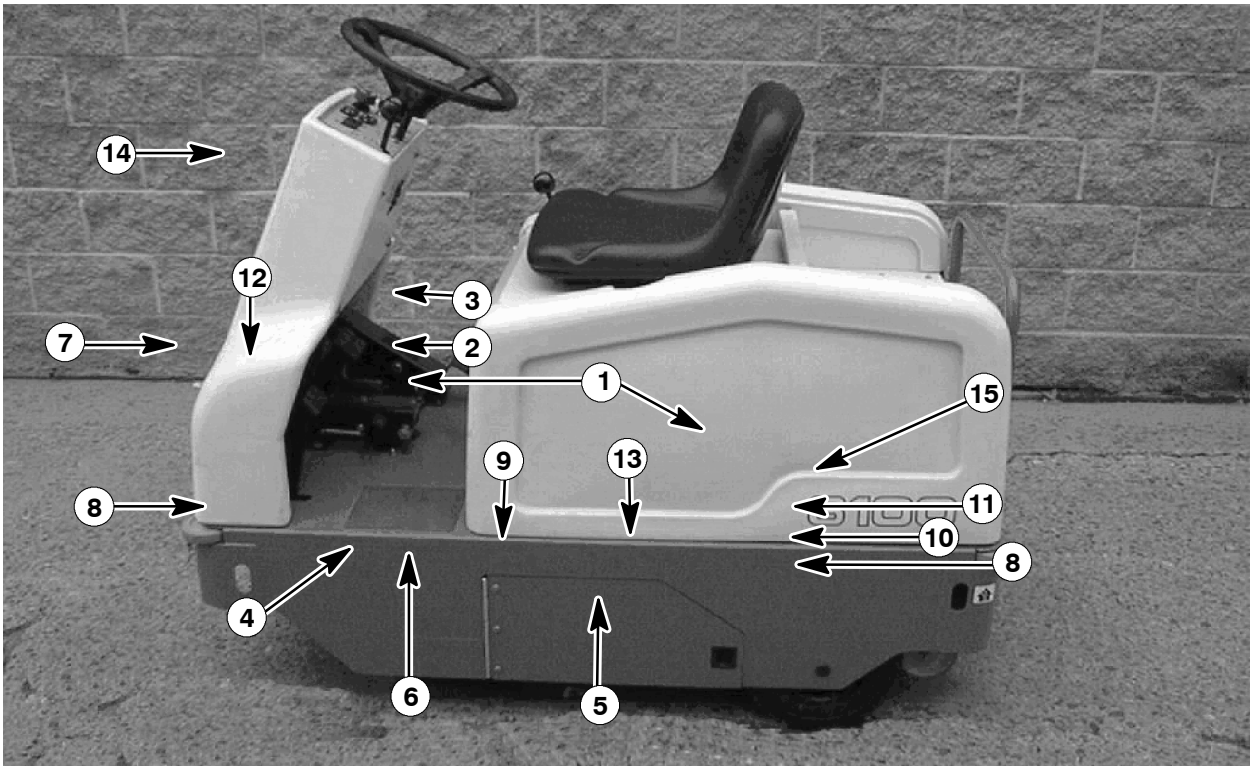
MACHINE DIMENSIONS

MAINTENANCE



MAINTENANCE CHART

Interval	Key	Description	Procedure	Lubricant/ Fluid	No. of Service Points
Daily	3	Engine	Check oil level	EO	1
			Check air intake and cooling areas for debris	–	1
	6	Brush compartment skirts and seals	Check for damage, wear, and adjustment	–	6
	4	Main brush	Check for damage or wear	–	1
	5	Side brush(es)	Check for damage or wear	–	1 (2)
			Check brush pattern	–	1 (2)
	7	Hopper dust filter	Shake	–	1
25 Hours	3	Engine	Clean air filter element	–	1
50 Hours	3	Engine oil	Change	EO	2
	3	Engine air filter	Replace	–	2
	2	Vacuum fan belt	Check tension and wear	–	2
	4	Main brush	Rotate end-for-end	–	1
			Check brush pattern	–	1
	15	QuickMop™ broom (Option)	Rotate or wash sweep heads	–	2

Interval	Key	Description	Procedure	Lubricant/ Fluid	No. of Service Points
100 Hours	3	Engine	Change oil and filter element	EO	1
			Clean or replace spark plugs	–	1
			Clean or replace air filter element	–	1
			Clean cooling fins	–	1
	–	Battery	■Check electrolyte	DW	1
	7	Hopper dust filter	Check for damage, clean or replace	–	1
	8	Tires	Check for damage or wear	–	3
	9	Large Debris Trap Flap	Check for damage or wear	–	1
	10	Propelling chain	Lubricate and check tension	EO	1
	12	Hopper Seal	Check for damage or wear	–	4
200 Hours	1	Engine	Clean or replace spark plugs	–	1
	1	Engine	Clean fuel filter/ sediment bowl	–	1
	11	Brake	Check adjustment	–	1
	13	Side brush(es)	Check pivot adjustment	–	1 (2)
	2	Vacuum fan belt	Check tension and wear	–	1
	3	Main brush belt	Check for wear	–	1
300 Hours	13	Side brush motor(s)	Check motor brushes	–	1
800 Hours		Hydraulic fluid reservoir	Replace filler cap.	–	3
			Replace suction strainer	–	3
			Change hydraulic fluid	HYDO	3
		Hydraulic fluid filter	■Change filter element	–	3
	–	Hydraulic hoses	Check for wear and damage	–	3
	1	Propelling motor	■Torque shaft nut	–	3
	1	Engine	Replace fuel filter.	–	3
	–	Battery	■Clean and tighten battery cable connections	–	3

LUBRICANT/FLUID
DW . . . . Distilled water
EO . . . . SAE 10W–30 Engine oil
HYDO . TENNANT or approved hydraulic fluid

NOTE: More frequent intervals may be required in extremely dusty conditions.

NOTE: Also check procedures indicated (■) after the first 50 hours of operation.

PUSHING, TOWING, AND TRANSPORTING THE MACHINE

PUSHING OR TOWING THE MACHINE

If the machine becomes disabled, it can be pushed or towed from the front or rear, but it is easier and more stable to tow from the front end.

Only push or tow the machine for a *very short distance* and do not exceed 1.6 kp/h (1 mph). It is NOT intended to be pushed or towed a long distance or at a high speed.

ATTENTION! Do not push or tow machine for a long distance or damage may occur to the propelling system.

TRANSPORTING THE MACHINE

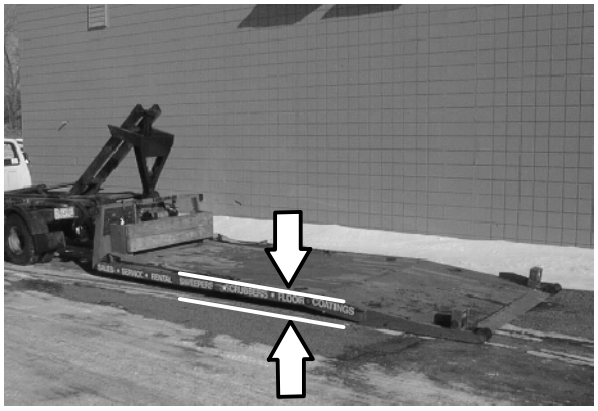
1. Position the front of the machine at the loading edge of the truck or trailer.

   FOR SAFETY: Use truck or trailer that will support the weight of the machine.

NOTE: Empty the hopper before transporting the machine.

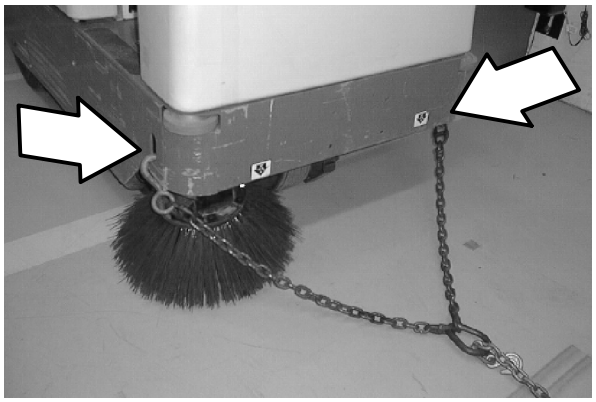
2. If the loading surface is not horizontal or is higher than 380 mm (15 in) from the ground, use a winch to load machine.

   If the loading surface is horizontal AND is 380 mm (15 in) or less from the ground, the machine may be driven onto the truck or trailer.



3. To winch the machine onto the truck or trailer, attach the winching chains to the front tie down located in the front of the machine frame.

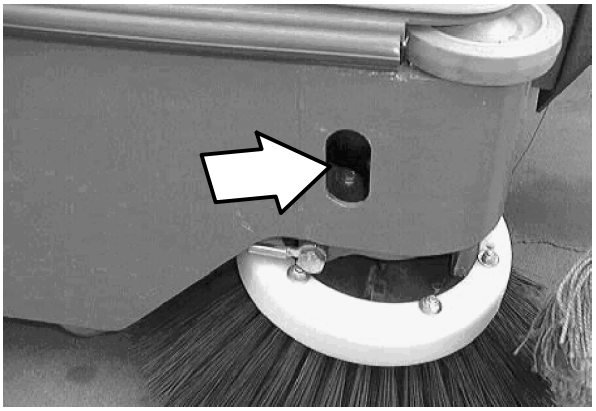
   FOR SAFETY: When loading machine onto truck or trailer, use winch. Do not drive the machine onto the truck or trailer unless the loading surface is horizontal AND is 380 mm (15 in) or less from the ground.



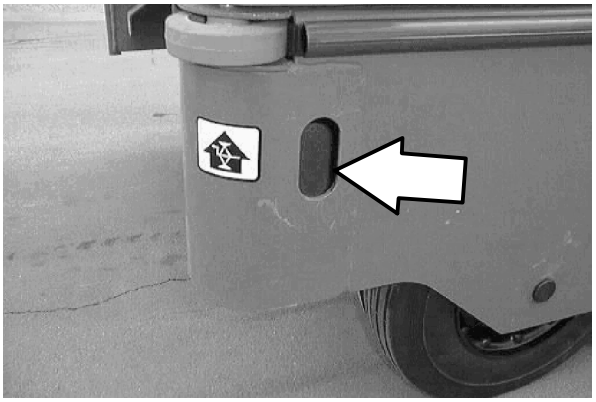
4. Position the machine onto the truck or trailer as far as possible. If the machine starts to veer off the centerline of the truck or trailer, stop and turn the steering wheel to center the machine.

5. Set the parking brake and block the machine tires. Tie down the machine to the truck or trailer before transporting.

   The front tie-down locations are the holes in the front of the machine frame.



   The rear tie-down locations are the holes in the sides of the machine frame near the rear bumper.



6. If the loading surface is not horizontal or is higher than 380 mm (15 in) from the ground, use a winch to unload machine.

   If the loading surface is horizontal AND is 380 mm (15 in) or less from the ground, the machine may be driven off the truck or trailer.

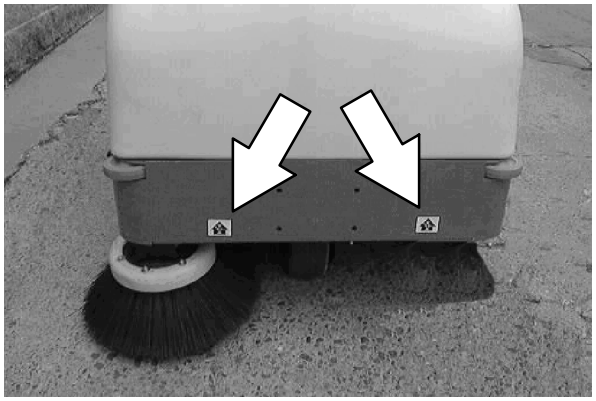
   FOR SAFETY: When unloading machine off truck or trailer, use winch. Do not drive the machine off the truck or trailer unless the loading surface is horizontal AND 380 mm (15 in) or less from the ground.

MACHINE JACKING

Empty the hopper before jacking the machine. You can jack up the machine for service at the designated locations. Use a hoist or jack that will support the weight of the machine. Always stop the machine on a flat, level surface and block the tires before jacking up the machine.

FOR SAFETY: Before leaving or servicing machine, stop on level surface, set parking brake, turn off machine, and remove key.

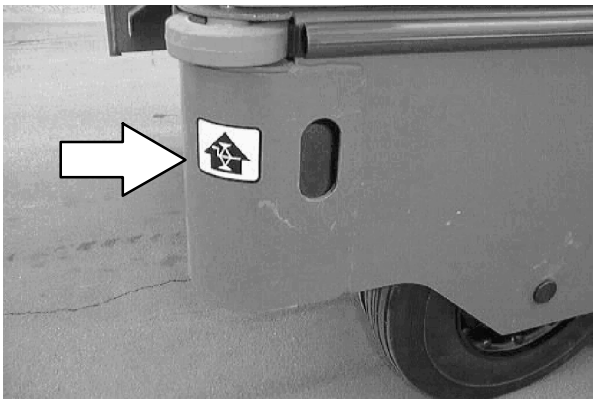
The front jacking locations are on the flat bottom edge of the front of the machine frame.



The rear jacking locations are on the corners of the rear frame.

FOR SAFETY: When servicing machine, block machine tires before jacking up machine.

FOR SAFETY: When servicing machine, jack up machine at designated locations only. Block machine up with jack stands.



STORING MACHINE

Before storing the machine for an extended time, the machine needs to be serviced to lessen the chance of rust, sludge, and other undesirable deposits from forming.

HARDWARE INFORMATION

The following charts state standard plated hardware tightening ranges for normal assembly applications. Decrease the specified torque by 20% when using a thread lubricant. Do not substitute lower grade hardware for higher grade hardware. If higher grade hardware than specified is substituted, tighten only to the specified hardware torque value to avoid damaging the threads of the part being threaded into, as when threading into speed nuts or weldments.

STANDARD BOLT TORQUE CHART

Thread Size	SAE Grade 5 Torque ft lb (Nm)	SAE Grade 8 Torque ft lb (Nm)
0.25 in	7–10 (9–14)	10–13 (14–38)
0.31 in	15–20 (20–27)	20–26 (27–35)
0.38 in	27–35 (37–47)	36–47 (49–64)
0.44 in	43–56 (58–76)	53–76 (72–103)
0.50 in	65–85 (88–115)	89–116 (121–157)
0.62 in	130–170 (176–231)	117–265 (159–359)
0.75 in	215–280 (291–380)	313–407 (424–552)
1.00 in	500–650 (678–881)	757–984 (1026–1334)

NOTE: Decrease torque by 20% when using a thread lubricant.

METRIC BOLT TORQUE CHART

Thread Size	Class 8.8 Torque ft lb _Nm)	Class 10.9 Torque ft lb (Nm)
M4	2 (3)	3 (4)
M5	4 (5)	6 (8)
M6	7 (9)	10 (14)
M8	18 (24)	25 (34)
M10	32 (43)	47 (64)
M12	58 (79)	83 (112)
M14	94 (127)	133 (180)
M16	144 (195)	196 (265)
M20	260 (352)	336 (455)
M24	470 (637)	664 (900)

NOTE: Decrease torque by 20% when using a thread lubricant.

Exceptions to the above chart:

Check the machine for exceptions!

BOLT IDENTIFICATION

Identification Grade Marking	Specification and Grade
	SAE–Grade 5
	SAE–Grade 8
	ISO–Grade 8.8
	ISO–Grade 10.9

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THREAD SEALANT AND LOCKING COMPOUNDS

Thread sealants and locking compounds may be used on this machine. They include the following:

Locktite 515 sealant – gasket forming material. TENNANT Part No. 75567,15 oz (440 ml) cartridge.

Locktite 242 blue – medium strength thread locking compound. TENNANT Part No. 32676, 0.5 ml tube.

Locktite 271 red – high strength thread locking compound. TENNANT Part No. 19857, 0.5 ml tube.

HYDRAULIC FITTING INFORMATION

HYDRAULIC TAPERED PIPE FITTING (NPT) TORQUE CHART

NOTE: Ratings listed are when using teflon thread seal.

Size	Minimum Torque	Maximum Torque
1/4 NPT	10 ft lb (14 Nm)	30 ft lb (41 Nm)
1/2 NPT	25 ft lb (34 Nm)	50 ft lb (68 Nm)
3/4 NPT	50 ft lb (68 Nm)	100 ft lb (136 Nm)

HYDRAULIC TAPERED SEAT FITTING (JIC) TORQUE CHART

Tube O.D. (in)	Thread Size	Maximum Torque
0.25	0.44-20	9 ft lb (12 Nm)
0.38	0.56-18	20 ft lb (27 Nm)
0.50	0.75-16	30 ft lb (41 Nm)
0.62	0.88-14	40 ft lb (54 Nm)
0.75	1.12-12	70 ft lb (95 Nm)
1.0	1.31-12	90 ft lb (122 Nm)

HYDRAULIC O-RING FITTING TORQUE CHART

Tube O.D. (in)	Thread Size	Minimum Torque	Maximum Torque
0.25	0.44-20	6 ft lb (8 Nm)	9 ft lb (12 Nm)
0.38	0.56-18	13 ft lb (18 Nm)	20 ft lb (27 Nm)
		*10 ft lb (14 Nm)	12 ft lb (16 Nm)
0.50	0.75-16	20 ft lb (27 Nm)	30 ft lb (41 Nm)
		*21 ft lb (28 Nm)	24 ft lb (33 Nm)
0.62	0.88-14	25 ft lb (34 Nm)	40 ft lb (54 Nm)
0.75	1.12-12	45 ft lb (61 Nm)	70 ft lb (95 Nm)
1.0	1.31-12	60 ft lb (81 Nm)	90 ft lb (122 Nm)

NOTE: Do not use sealant on o-ring threads.

*Aluminum bodied components

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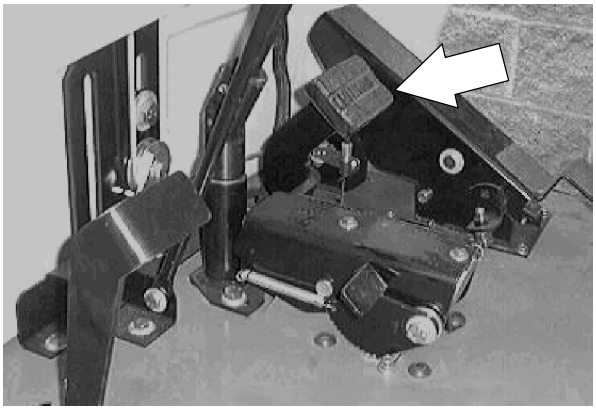
INTRODUCTION

This section includes information on the main chassis related components for example the seat, steering, brakes, and tires.

BRAKES AND TIRES

SERVICE BRAKES

The service brakes on the model 6100G consists of a single disc and caliper located on the front tire and wheel assembly. The parking brake uses the same disc and caliper. The service brake and parking brake are each actuated with a foot pedal.

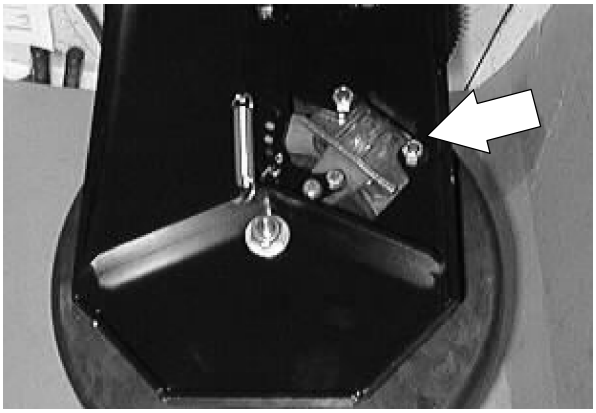


TO ADJUST SERVICE BRAKE

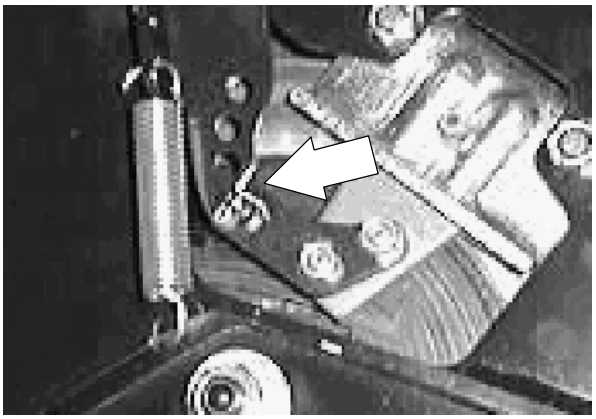
FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, place blocks in front and back of back wheels.

1. If the service brake pedal has excessive movement before the brake is activated, the service brake needs to be adjusted.

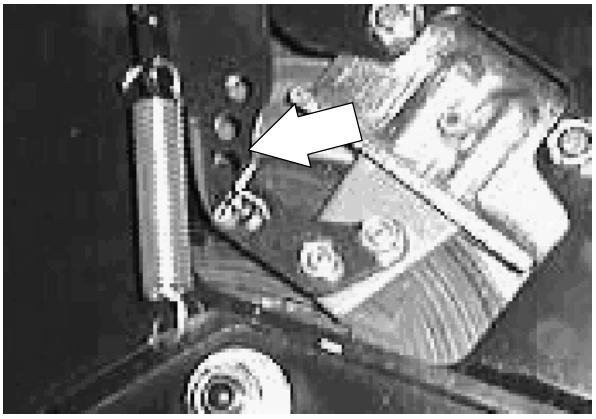
2. Go under the front of the machine and locate the disc brake caliper assembly.



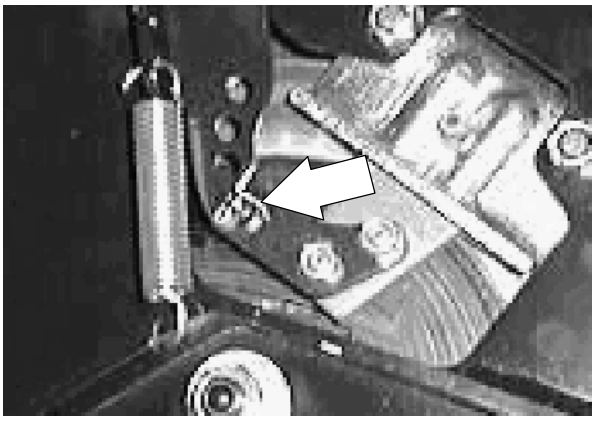
3. Remove the small cotter pin from the caliper lever pin.



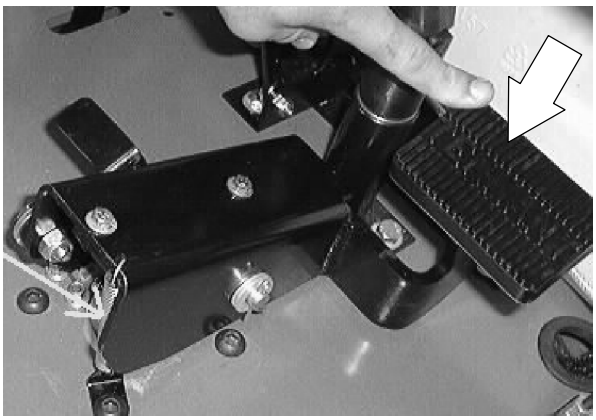
4. Move the lever up to the next hole in the brake bracket.



5. Reinstall the small cotter pin into the lever pin.



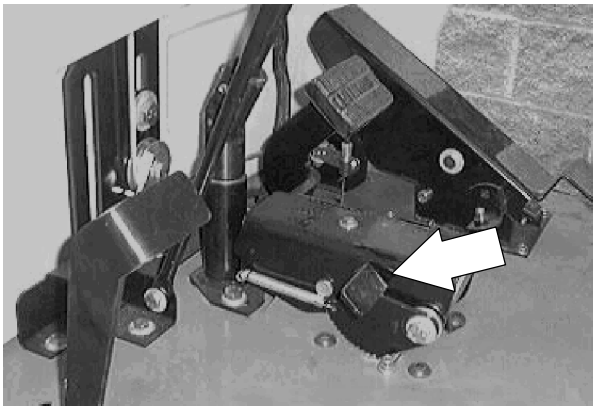
6. Go to the operators compartment and step on the service brake pedal. There should be just a small amount of movement before the brakes are engaged. If this is the case, the adjustment is complete, if not, repeat the previous step.



NOTE: If the lever does not reach the next hole, loosen the two screws holding the small lever to the caliper. The lever pin can now be moved up to the next hole. Retighten the hardware.

TO ADJUST PARKING BRAKE

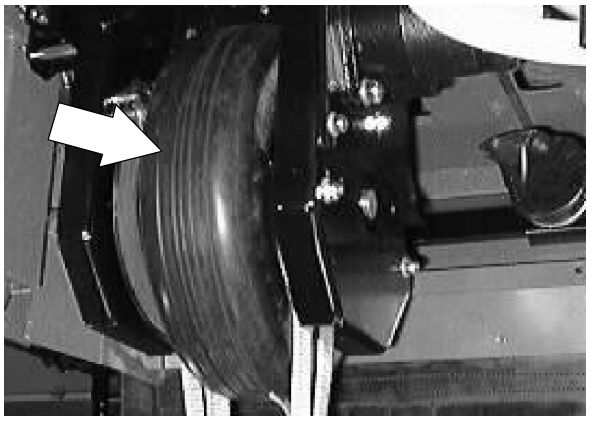
The parking brake adjustment is made at the same time as the service brake. See TO ADJUST SERVICE BRAKE instructions.



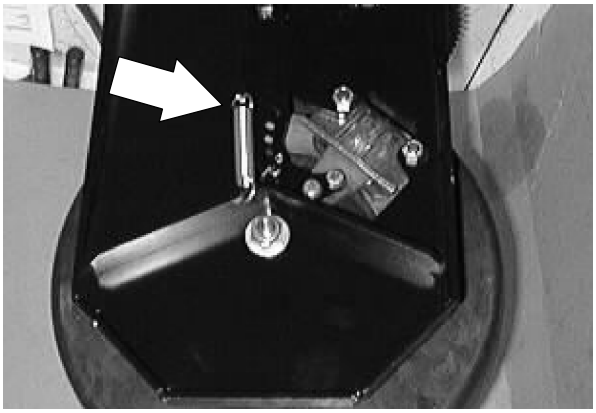
TO REPLACE BRAKE PADS

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake.

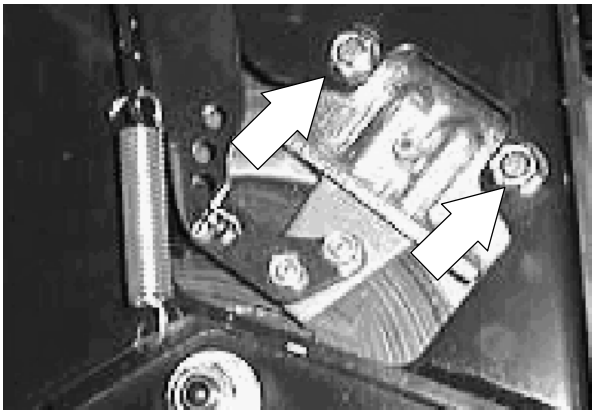
1. Remove the front wheel assembly. See TO REMOVE FRONT TIRE AND WHEEL instructions in this section.



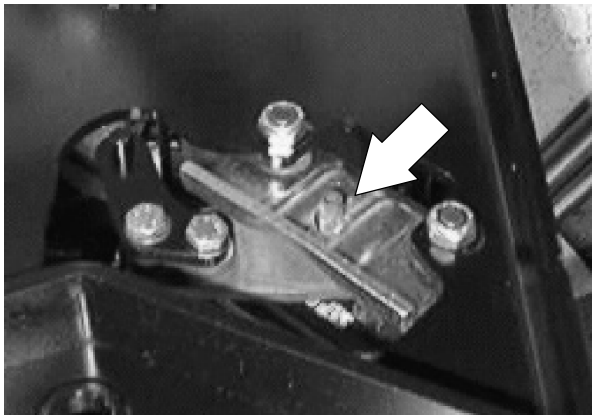
2. Remove the tension spring from the brake caliper lever and wheel housing.



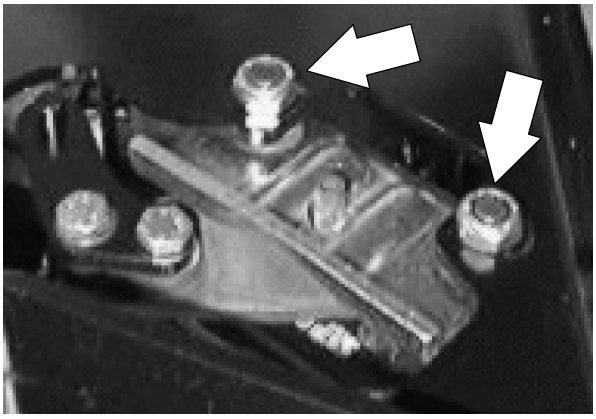
3. Remove the nuts from the shoulder screws holding the brake caliper to the wheel housing.



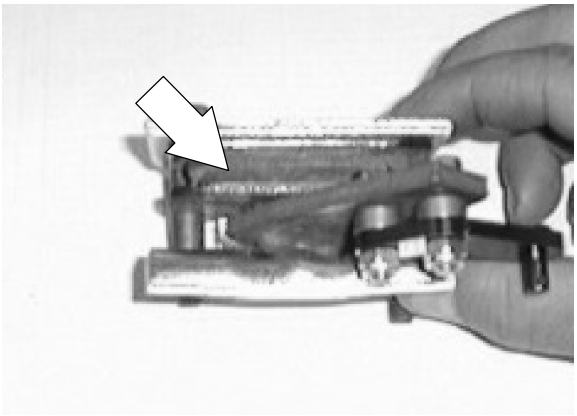
4. Remove the caliper assembly from the wheel housing. *Note the orientation of the caliper assembly on the wheel housing.*



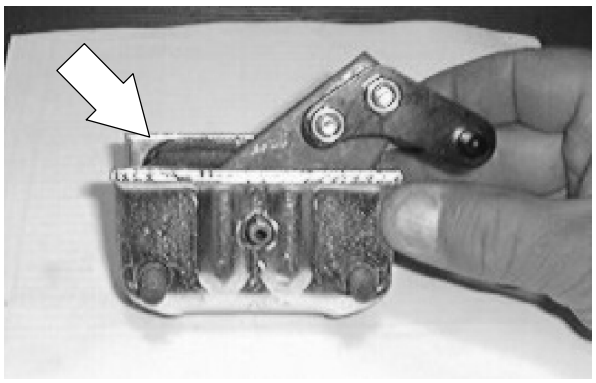
5. Remove the two shoulder screws from the caliper assembly.



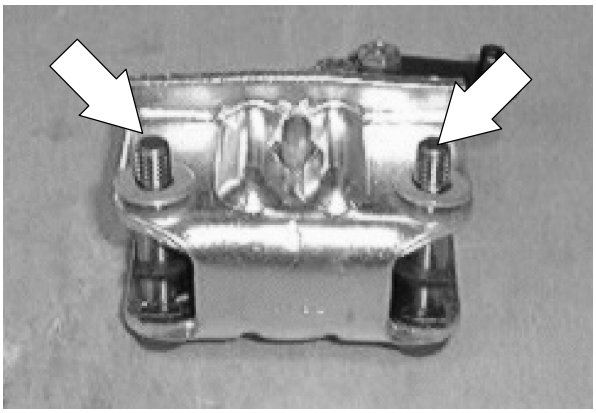
6. Pull the two brake pads out of the caliper assembly. *Note the orientation of the pads.*



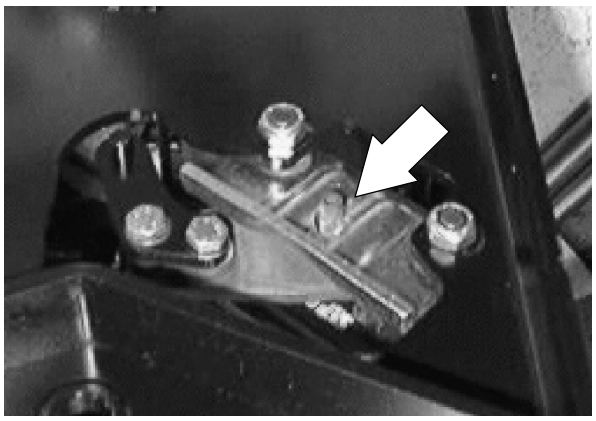
7. Install the new pads into the caliper assembly in the same orientation.



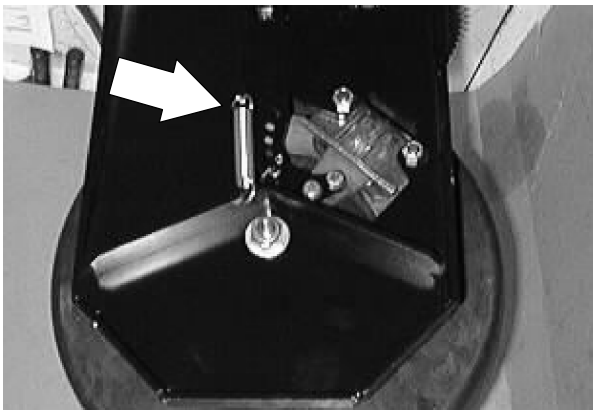
8. Reinstall the two shoulder screws into the caliper and new brake pads.



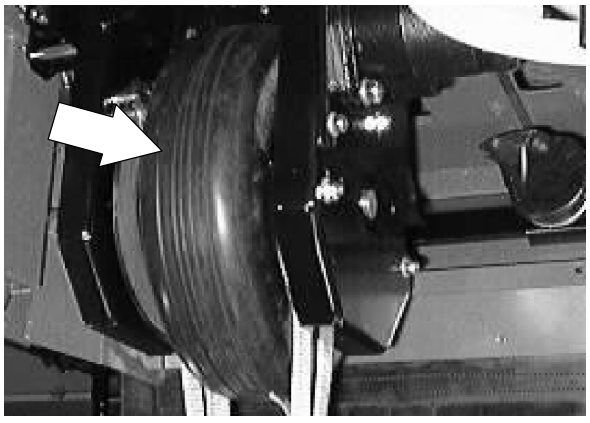
9. Reinstall the caliper assembly onto the wheel housing. Position the shoulder screws through the mount holes on the wheel housing. Reinstall the two nyloc nuts and tighten to 18 – 24 Nm (15 – 20 ft lb). Make sure the caliper free floats after the screws are tightened.



10. Reinstall the tension spring onto the brake caliper lever and wheel housing.



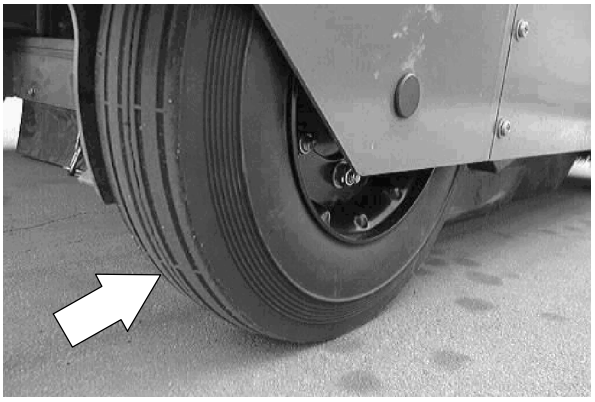
11. Reinstall the front tire and wheel assembly. See TO INSTALL FRONT TIRE AND WHEEL instructions in this section.



12. Operate the machine and check the brakes for proper operation.

REAR TIRES AND WHEELS

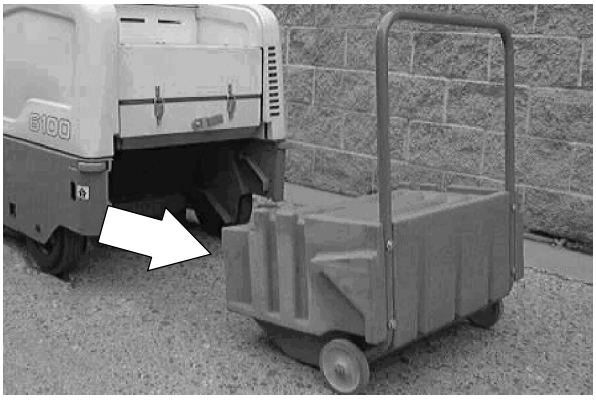
The rear tires on the 6100G are semi-pneumatic. The rear tires are free wheeling and have no braking capabilities.



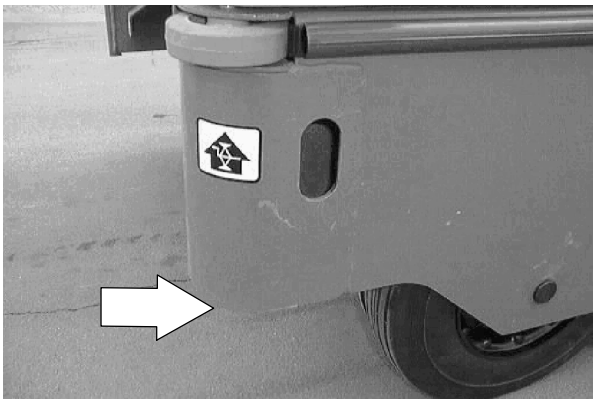
TO REMOVE REAR TIRE ASSEMBLY

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake.

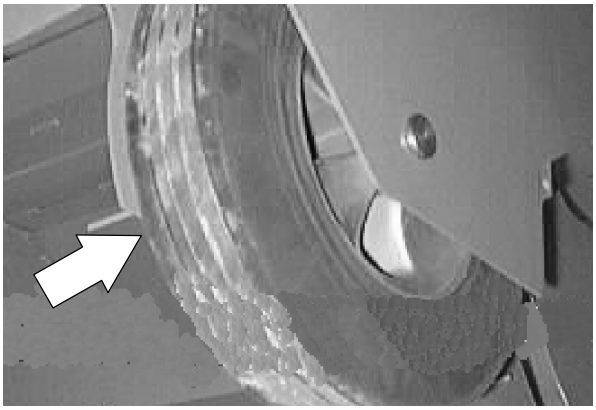
1. Remove the debris hopper from the rear of the machine.



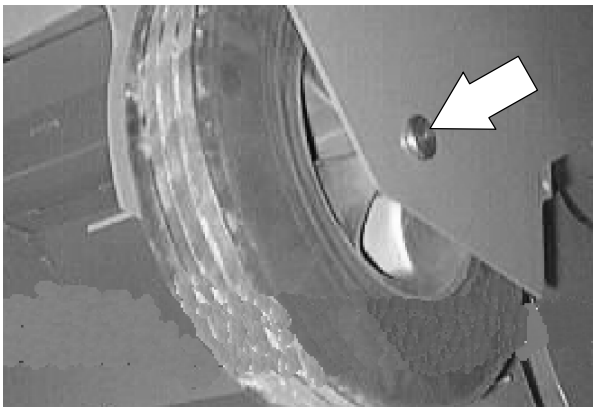
2. Jack up the machine at the rear jack point. Place a jack stand under the machine frame.



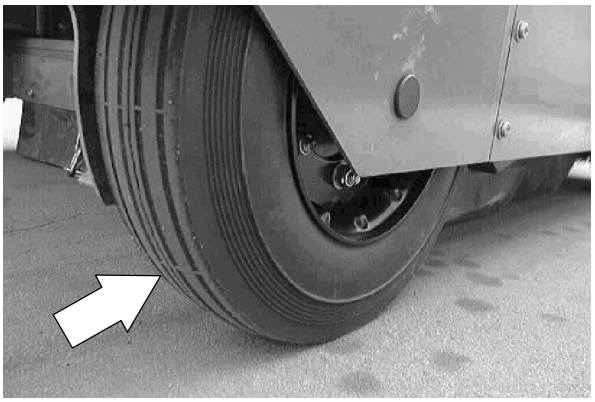
3. Go to the rear, inside of the machine frame and locate the large nyloc nut and washer holding the rear wheel axle to the machine. Remove the nyloc nut and washer.



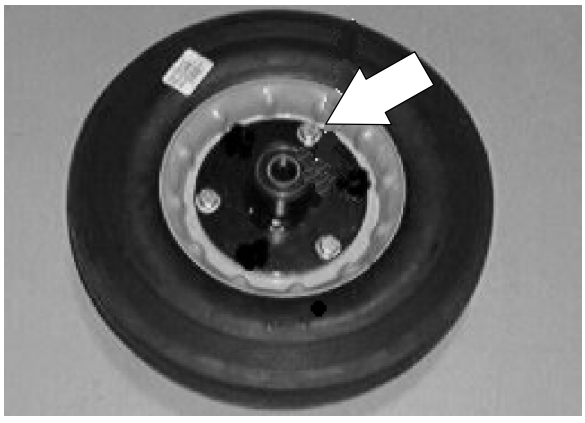
4. Support the rear wheel and remove the axle shaft.



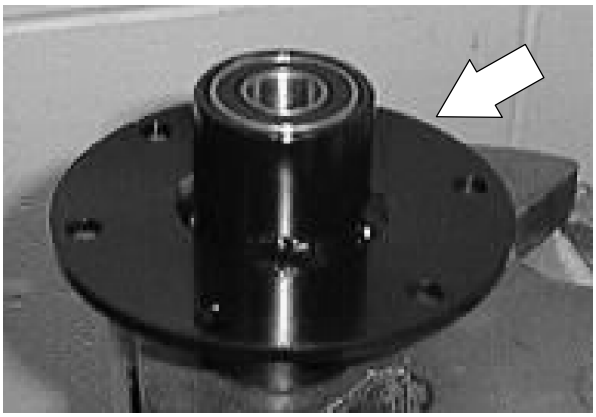
5. Remove the rear tire assembly from the machine.



6. Remove the three hex screws and nuts holding the wheel hub to the tire assembly.



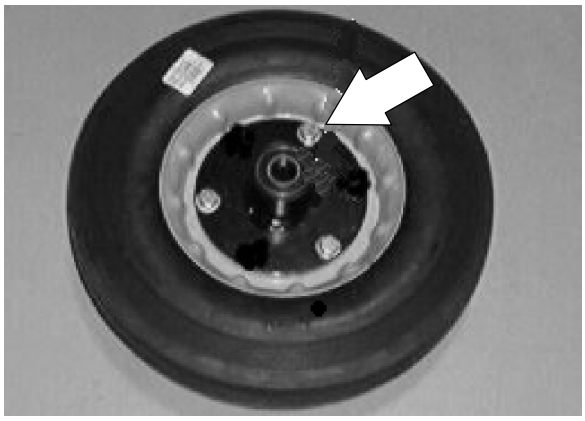
7. Remove the hub assembly from the tire assembly.



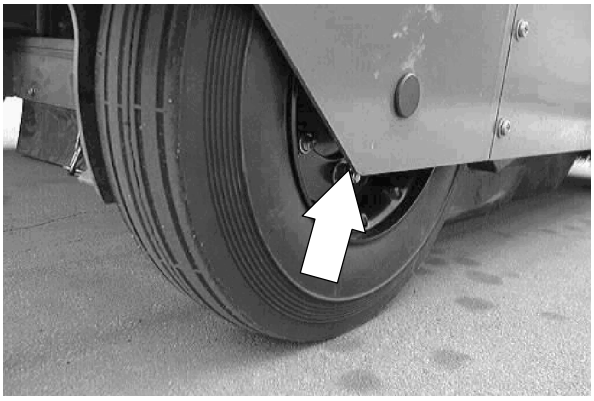
TO INSTALL REAR TIRE ASSEMBLY

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake.

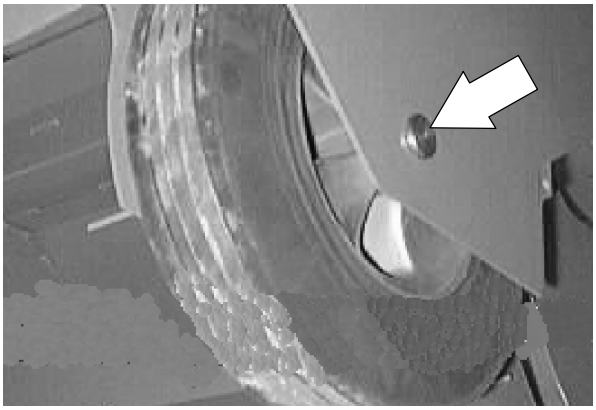
1. Position the rear hub assembly onto the new tire assembly. Place the three screws through the hub then through the wheel. Install the nuts. *Center the hub on the wheel.* Tighten the nuts to 18 – 24 Nm (15 – 20 ft lb).



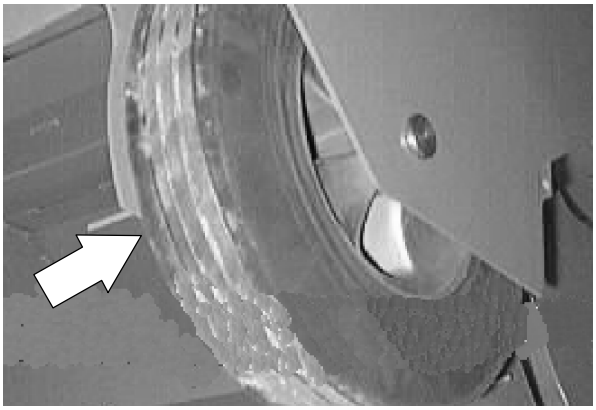
2. Install the tire and hub assembly into the machine with the hub positioned on the inside of the machine frame.



3. Hold the wheel in position and install the axle shaft from to outside of the machine frame. *Note the "D" shape of the frame mount hole and the " D" on the axle shaft.* Line these two up and push the axle all the way into the mount hole.



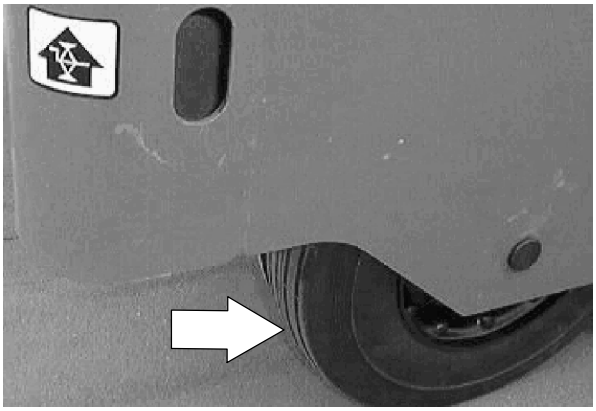
4. Go to the inside of the machine frame and install the washer and nyloc nut. Tighten to 37 – 48 Nm (26 – 34 ft lb).



5. Spin the tire assembly to make sure it turns freely.

6. Remove the jack stand and lower the machine to the floor.

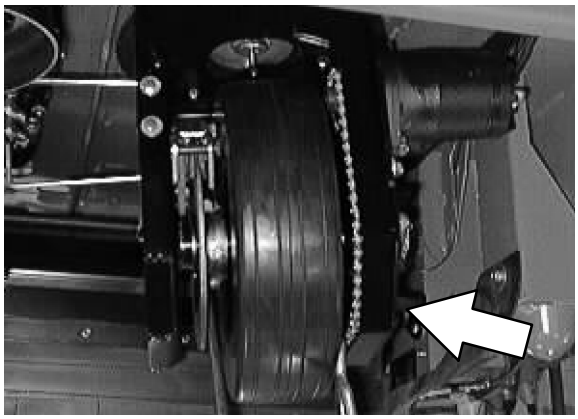
7. Operate the machine for proper operation.



FRONT DRIVE WHEEL, AND WHEEL HOUSING SUPPORT

The model 6100G is propelled forward and reverse by the front wheel assembly. An hydraulic motor turns an O–ring chain that turns the front tire assembly.

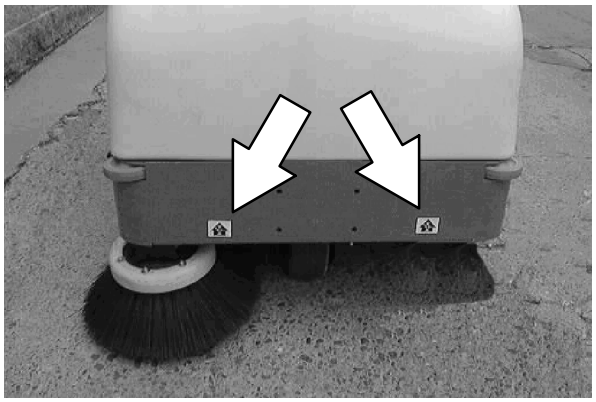
The steering on the model 6100G is controlled by a steering wheel which turns a chain that is connected to the front wheel housing. The front wheel housing turns on a large bearing and rubber seal.



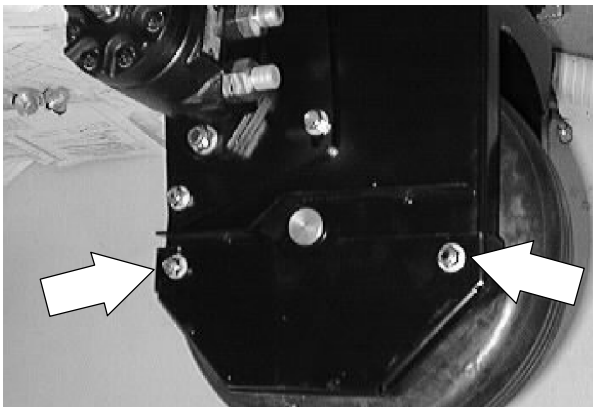
TO REMOVE FRONT TIRE AND WHEEL

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, place blocks in front and back of the rear tires.

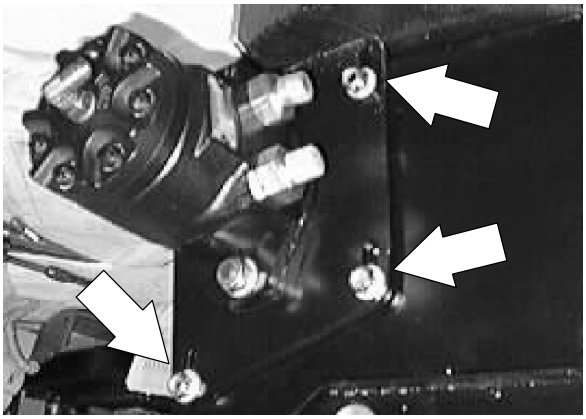
1. Jack up the front of the machine at the jack point. Install jack stands under the machine frame.



2. Remove the two nuts holding the chain guard to the wheel support. Remove the chain guard.

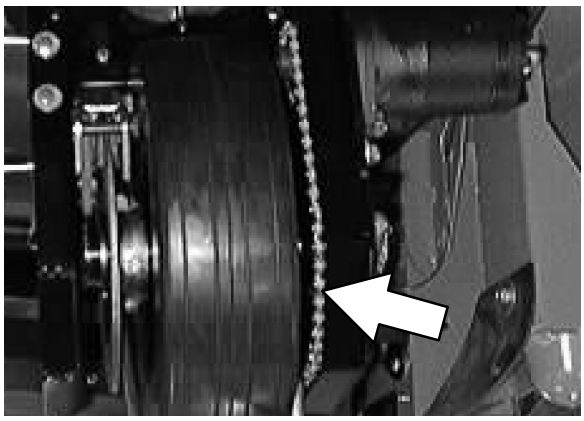


3. Loosen the three nuts holding the hydraulic motor to the wheel support. Let the hydraulic motor drop down so the drive chain has some slack.

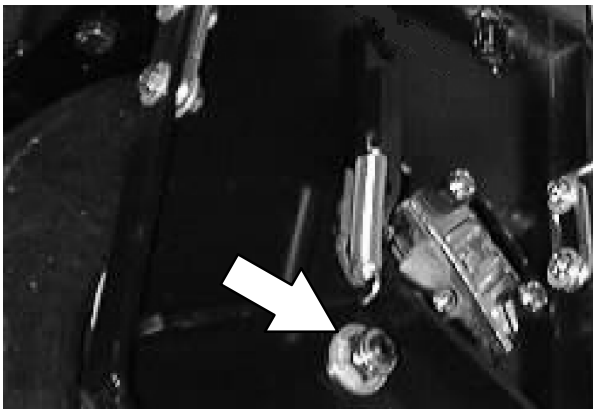


4. Turn the front tire until the master link is visible at the bottom of the drive sprocket. Remove the master link from the drive chain. **Make sure to retain the four small O-rings from behind the master link clip.**

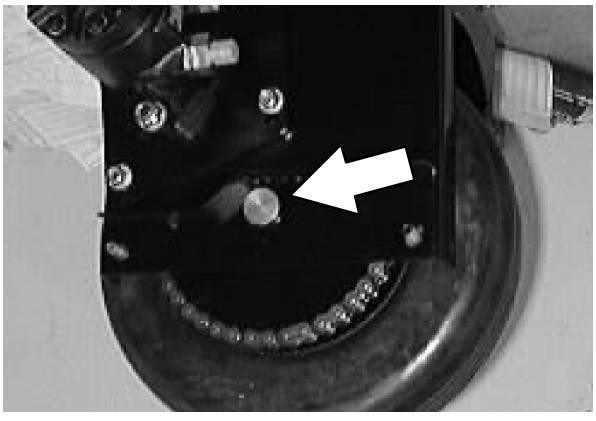
NOTE: Try to keep the chain on the upper sprocket when removing the wheel.



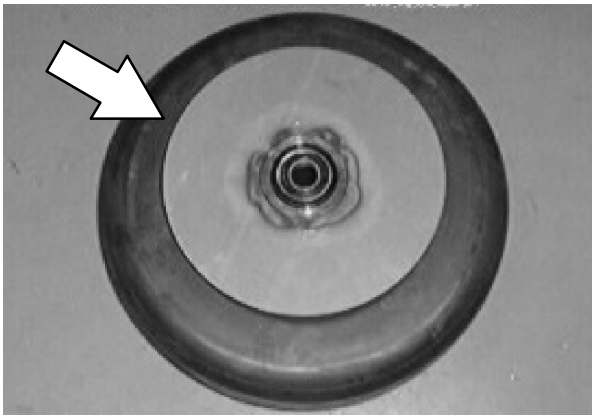
5. Remove the large nut and washer from the wheel axle.



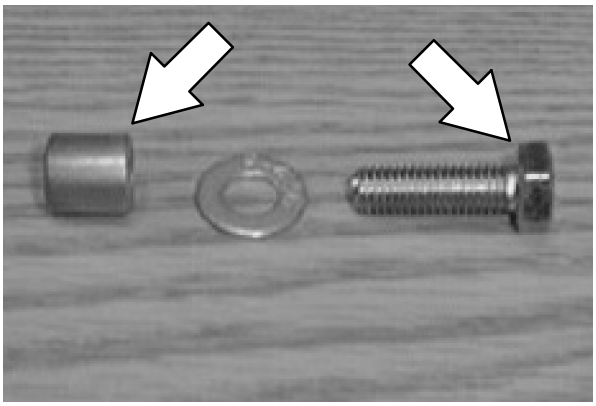
6. Support the front drive wheel. Remove the axle from the front wheel.



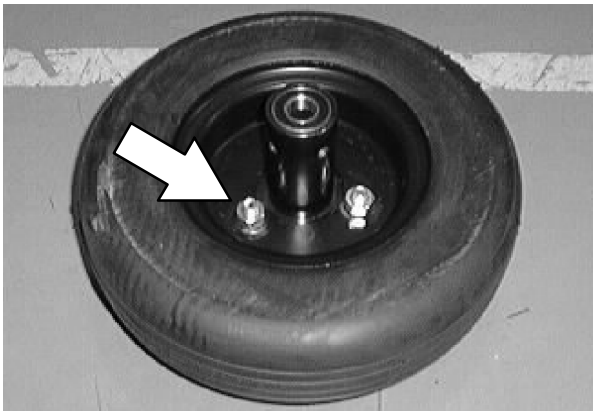
7. Let the front wheel drop down and out of the brake caliper. Remove the front drive wheel from the machine.



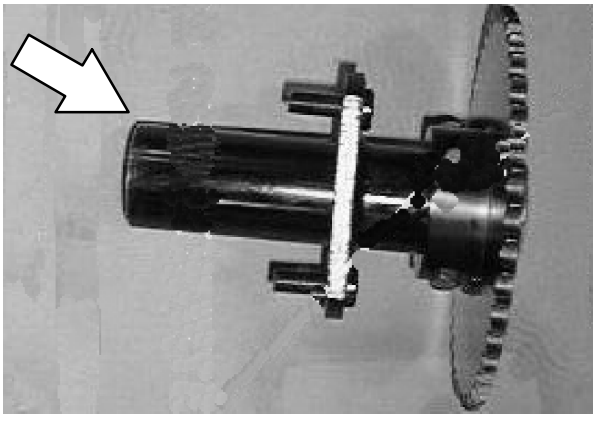
8. Remove the four screws holding the brake disc to the front hub assembly. *Make sure to retain the four steel sleeves. Pull the brake disc off the hub.*



9. Remove the three wheel nuts holding the tire to the front hub.



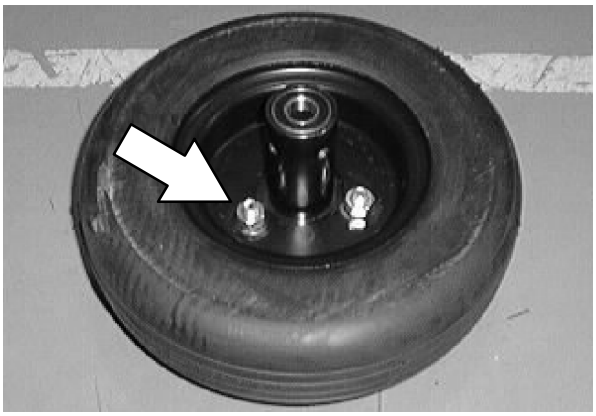
10. Remove the tire assembly from the hub.



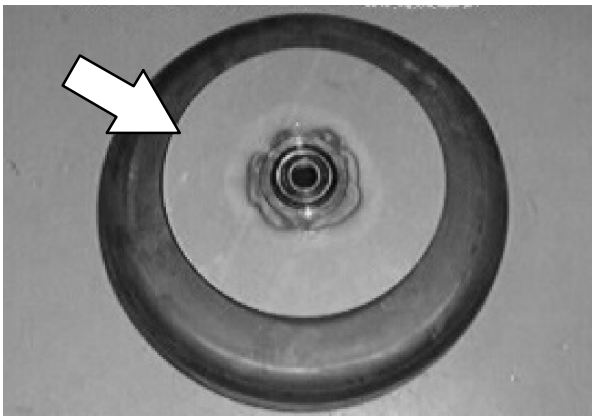
TO INSTALL FRONT TIRE AND WHEEL

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, place blocks in front and back of the rear tires.

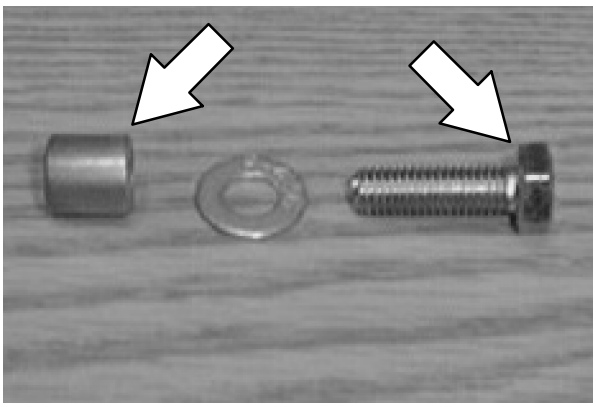
1. Position the new front tire onto the front hub assembly. Reinstall the three wheel nuts and tighten to 64 – 83 Nm (47 – 61 ft lb).



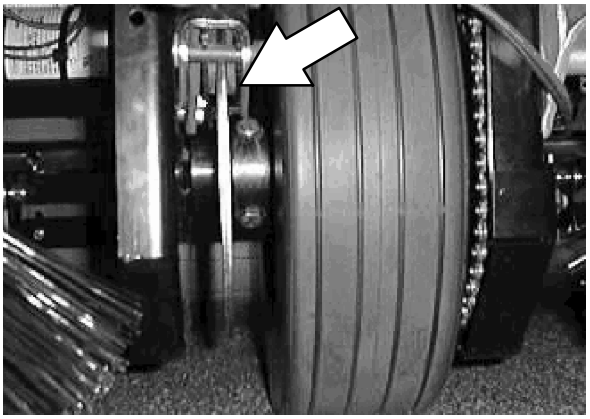
2. Reinstall the brake disc onto the front hub assembly. *NOTE: Place a small amount of grease in the ID of the brake disc. The hub of the brake disc is positioned toward the tire.*



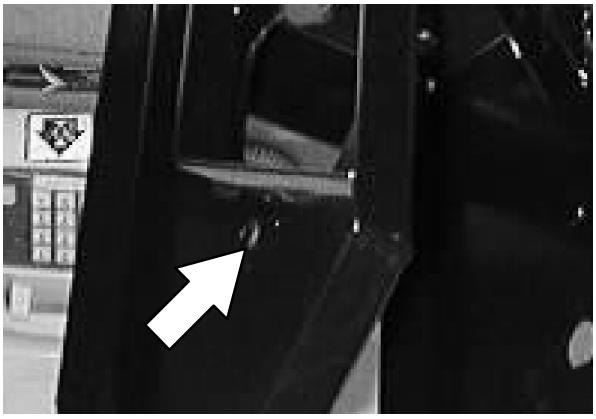
3. Reinstall the four hex screws and steel sleeves. Use red loctite (271) on the threads of the screws and tighten to 18 – 24 Nm (15 – 20 ft lb). Tighten these screws in a "criss-cross" pattern. **Make sure the disc floats on the hub.**



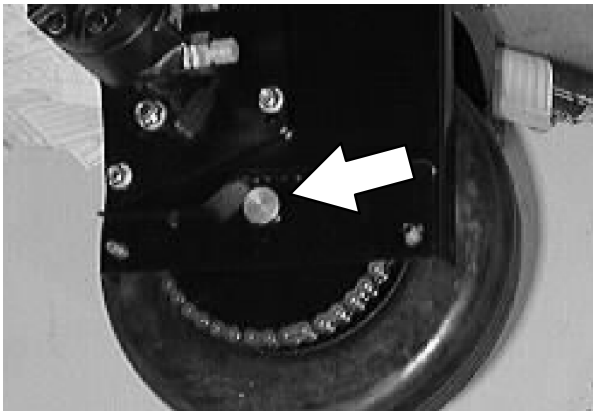
4. Position the front drive wheel assembly into the wheel housing. The brake disc is positioned on the left side of the wheel support. *NOTE: Use a screw driver to spread the brake pads apart to ease the installation of the assembly into the wheel support.*



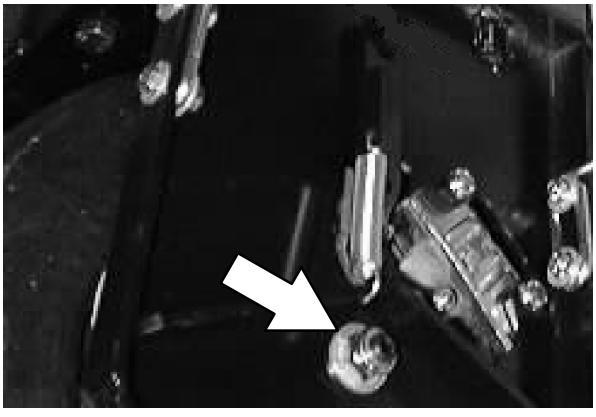
5. Line up the wheel hub bearings with the mount holes on the wheel support.



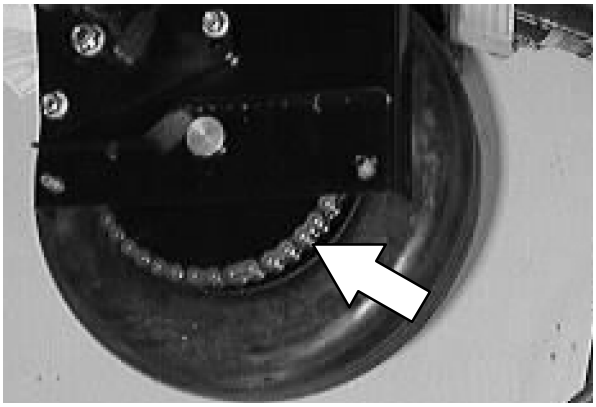
6. Push the wheel axle, from the right hand side, into the wheel housing and wheel hub. *Note the "D" shape of the wheel support mount hole and the " D" on the axle shaft.* Line these two up and push the axle all the way into the mount hole.



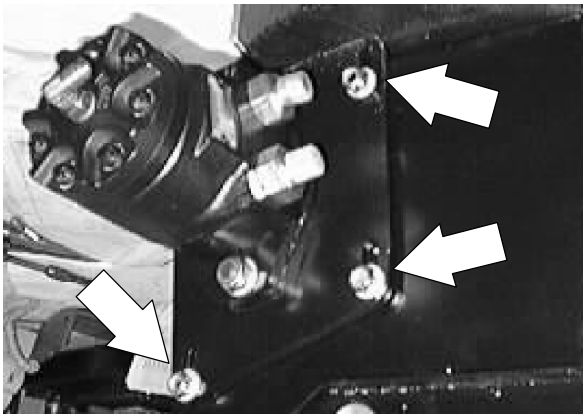
7. Install the washer and nyloc nut onto the axle shaft. Tighten to 64 – 83 Nm (47 – 61 ft lb).



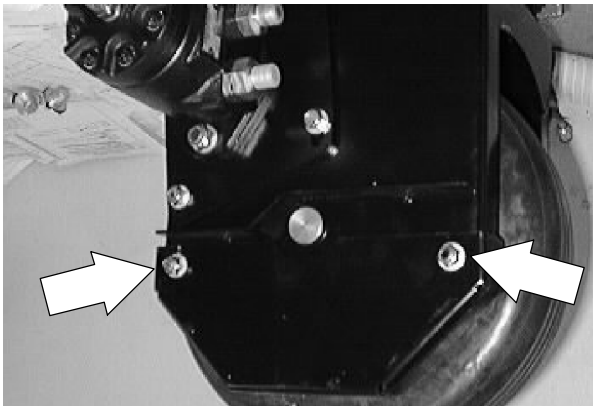
8. Spread the drive chain and install around the large sprocket on the front wheel assembly. Reinstall the master link. **Make sure the four small O-rings are in place behind the master link clip.**



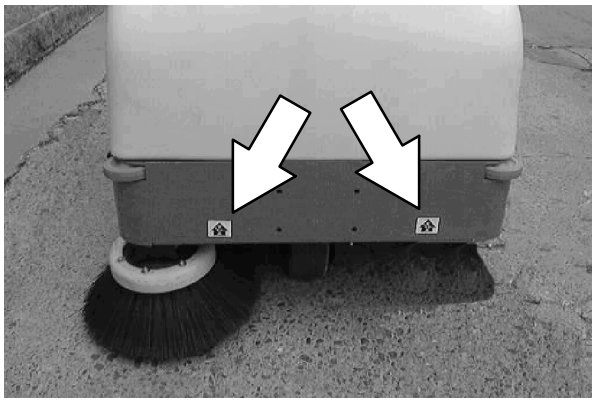
9. Push the hydraulic motor up until the drive chain is tight *(+/- 1/8 inch at mid-point)*. Tighten nuts to 18 – 24 Nm (15 – 20 ft lb).



10. Reinstall the drive chain guard and tighten the two nuts to 18 – 24 Nm (15 – 20 ft lb).



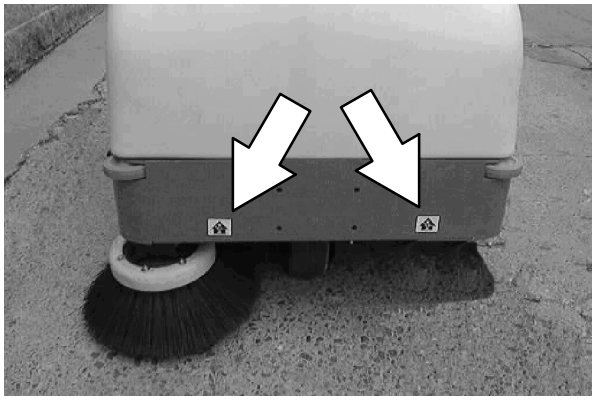
11. Remove the jack stands and lower the machine to the floor. Operate the machine and check for proper operation.



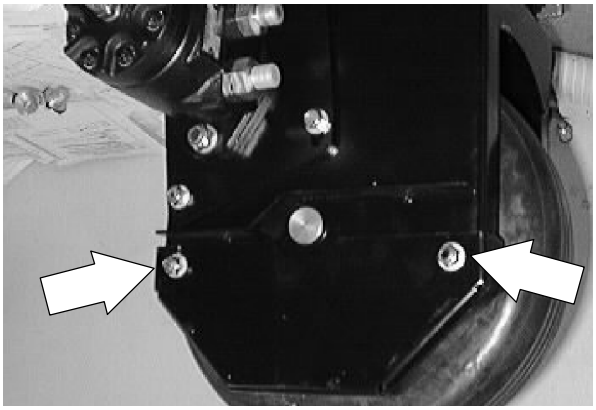
TO REPLACE FRONT WHEEL DRIVE CHAIN

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, place blocks in front and back of the rear tires.

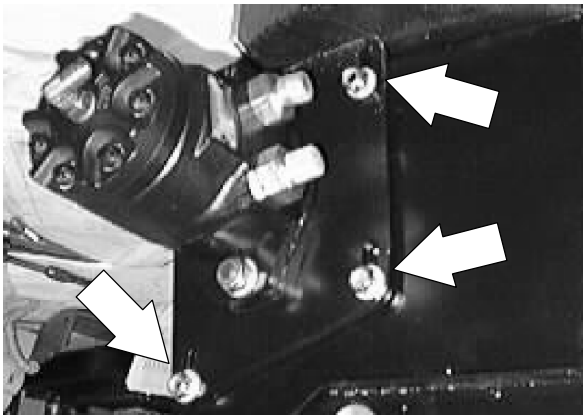
1. Jack up the front of the machine at the jack point. Install jack stands under the machine frame.



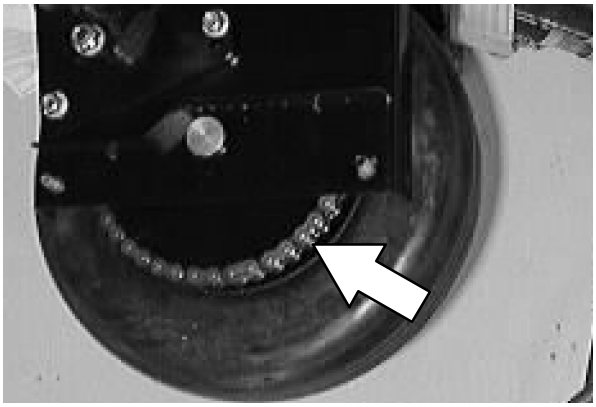
2. Remove the two nuts holding the chain guard to the wheel support. Remove the chain guard.



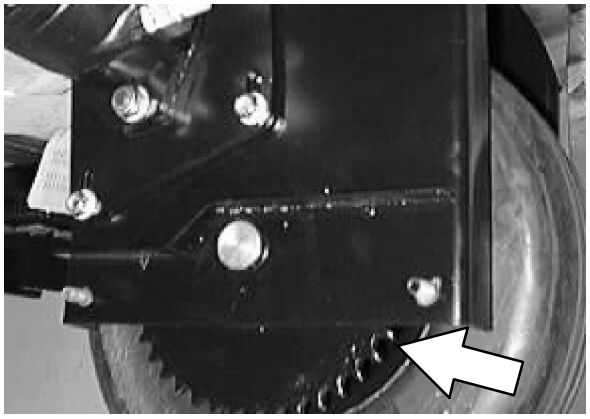
3. Loosen the three nuts holding the hydraulic drive motor to the wheel support. Let the motor drop down so the drive chain has some slack.



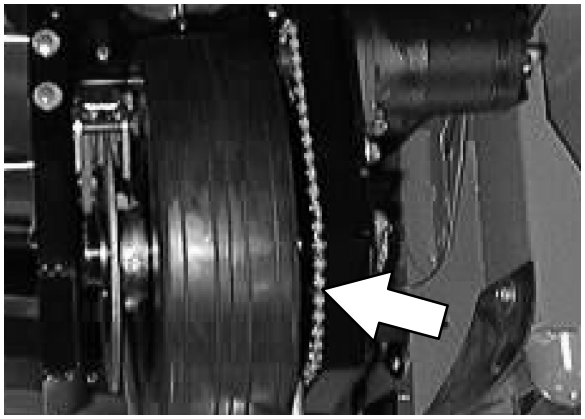
4. Spin the front tire until the master link is visible at the bottom of the drive sprocket. Remove the master link from the drive chain. **Make sure to retain the four small O-rings from behind the master link clip.**



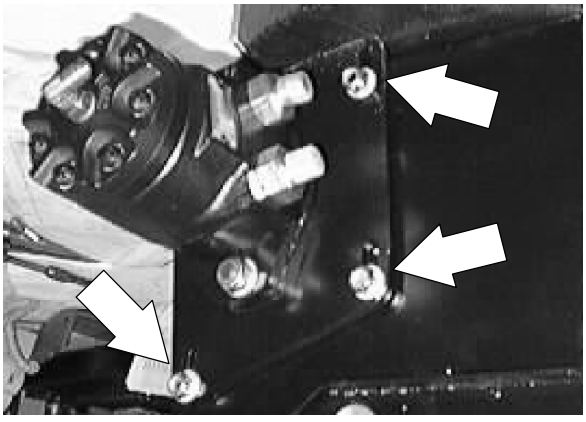
5. Pull the old chain off the drive motor sprocket and drive wheel sprocket. Remove the old drive chain from the machine.



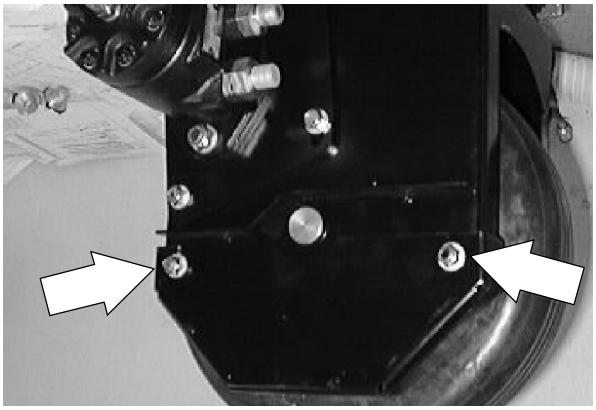
6. Reinstall the new drive chain around the drive sprocket on the drive motor and front wheel assembly. Reinstall the master link. **Make sure the four small O-rings are in place behind the master link clip.**



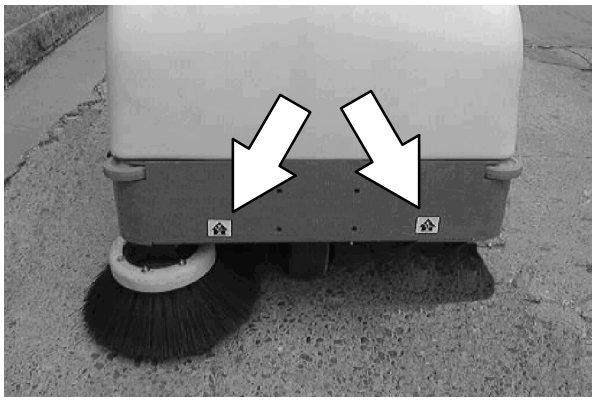
7. Push the hydraulic drive motor up until the chain is tight *(+/- 1/8 inch at mid-point)*. Tighten nuts to 18 – 24 Nm (15 – 20 ft lb).



8. Reinstall the drive chain guard and tighten the two nuts to 18 – 24 Nm (15 – 20 ft lb).



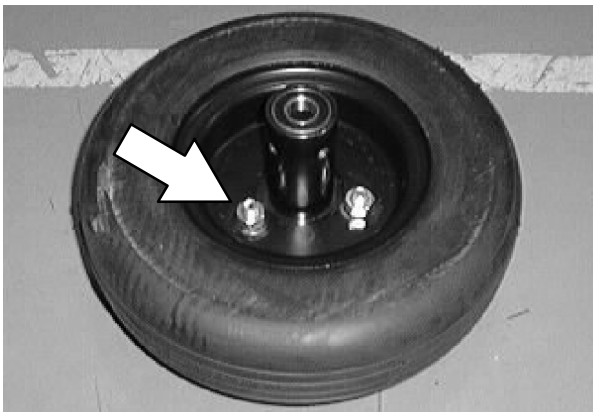
9. Remove the jack stands and lower the machine to the floor. Operate the machine and check the new drive chain for proper operation.



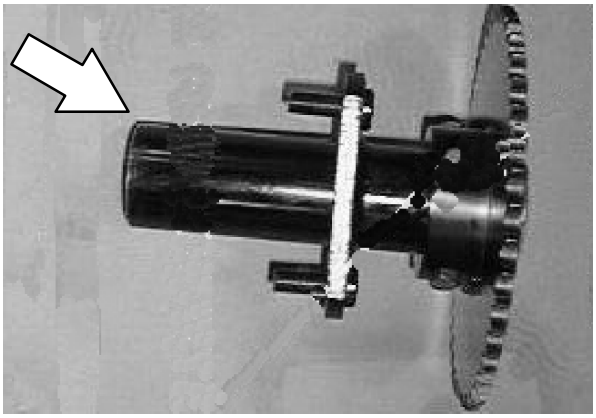
TO REPLACE FRONT WHEEL HUB BEARINGS

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, place blocks in front and back of the rear tires.

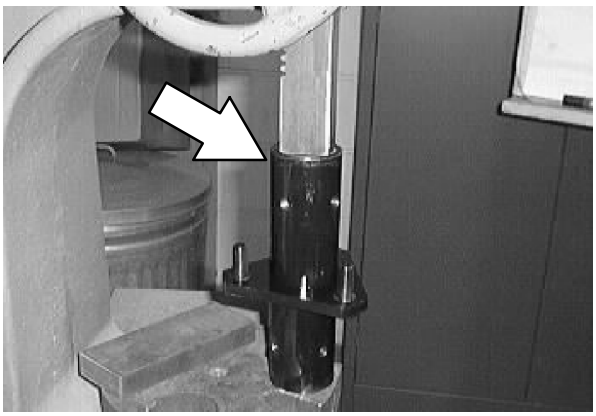
1. Remove the front tire and wheel assembly. See TO REMOVE FRONT TIRE AND WHEEL instructions in this section.



2. Use a long screw driver or punch to hammer the two bearings out of the front hub assembly. Discard the old bearings.



3. Use an arbor press to install the new bearings into the front hub. Push the bearings down until they are seated flush against the housing.

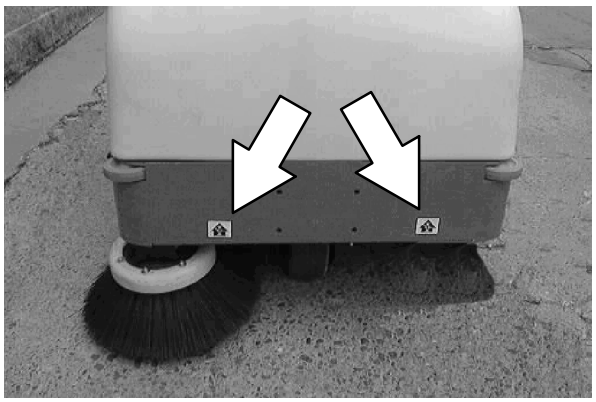


4. Reinstall the front wheel assembly. See TO INSTALL FRONT TIRE AND WHEEL instructions in this section.

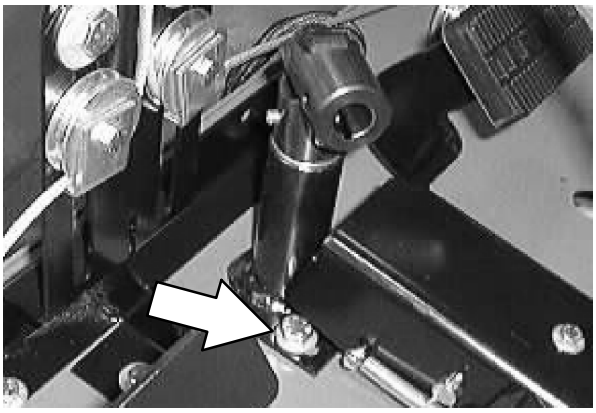
TO ADJUST STEERING CHAIN

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake.

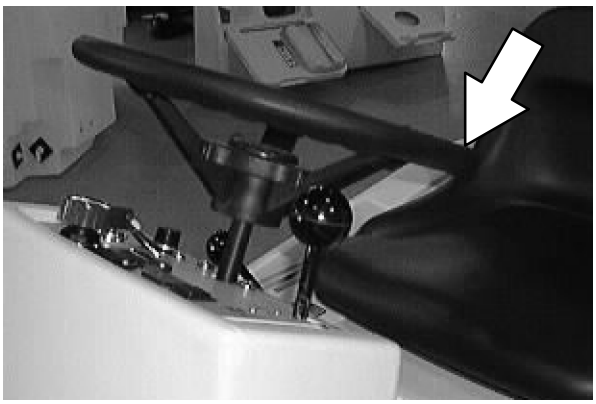
1. Jack up the front of the machine at the jack point. Install jack stands under the machine frame.



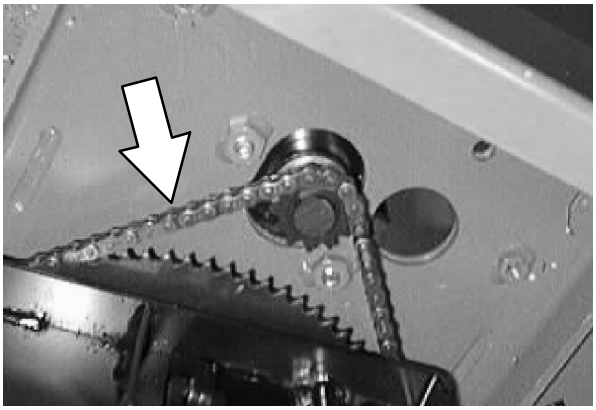
2. Go to the operators compartment and locate the two hex screws holding the steering bearing housing to the machine frame. Loosen the two screws.



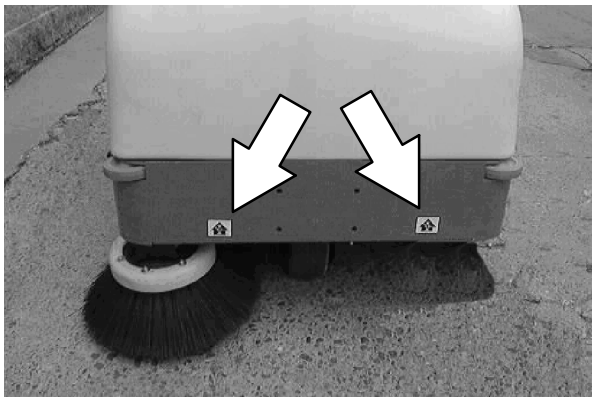
3. Turn the steering wheel all the way to the left and then to the right. Find the point in the rotation where the steering chain is the most tight.



4. Push the bearing housing forward in the slots. This will remove any excess slack in the steering chain. Tighten the two hex screws to 37 – 48 Nm (26 – 34 ft lb).



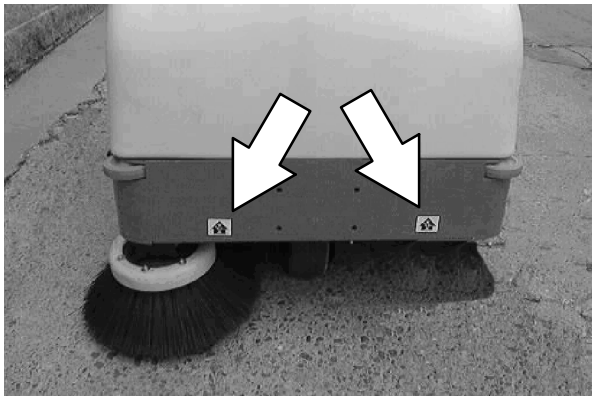
5. Remove the jack stands and lower the machine to the floor. Operate the machine and check the steering chain for proper operation.



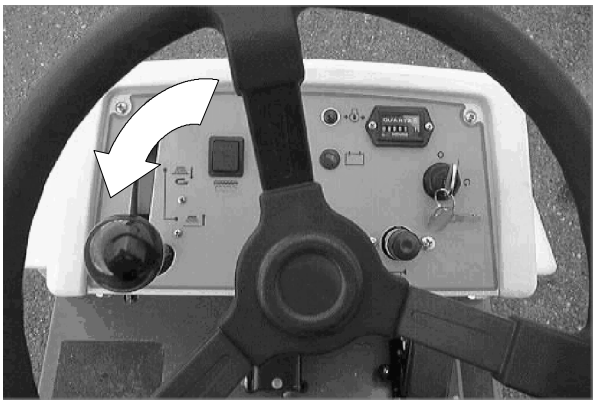
TO REPLACE STEERING CHAIN

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, place blocks in front and back of the rear tires.

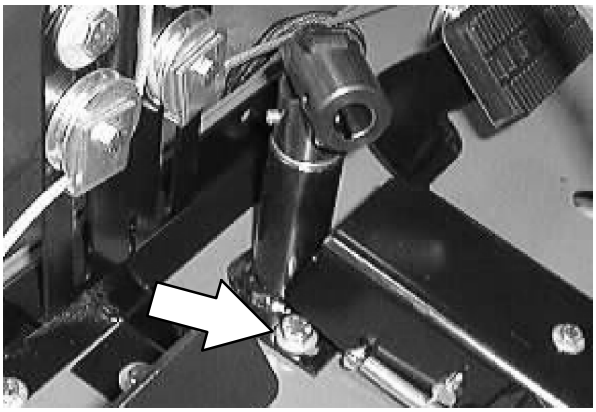
1. Jack up the front of the machine at the jack point. Install jack stands under the machine frame.



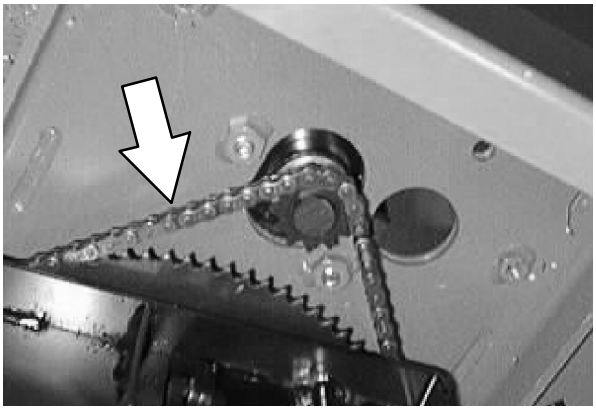
2. Turn the steering wheel all the way to the left.



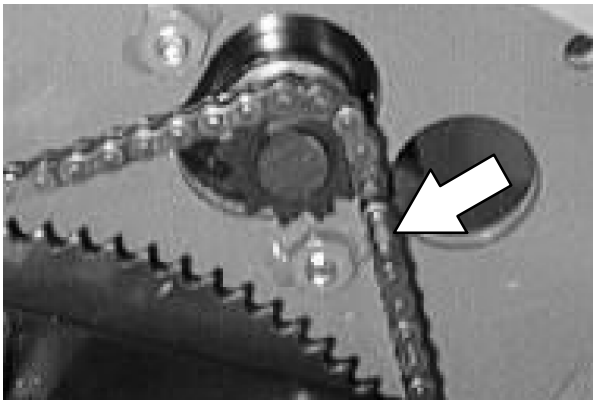
3. Go to the operators compartment and locate the two hex screws holding the steering bearing housing to the machine frame. Loosen the two screws and push the bearing housing back in the slots.



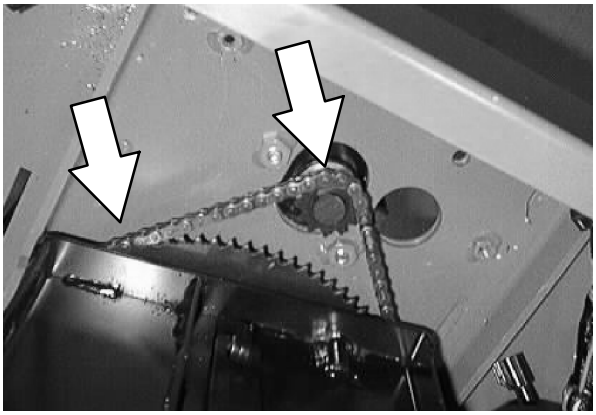
4. Go under the machine and locate the small steering chain sprocket.



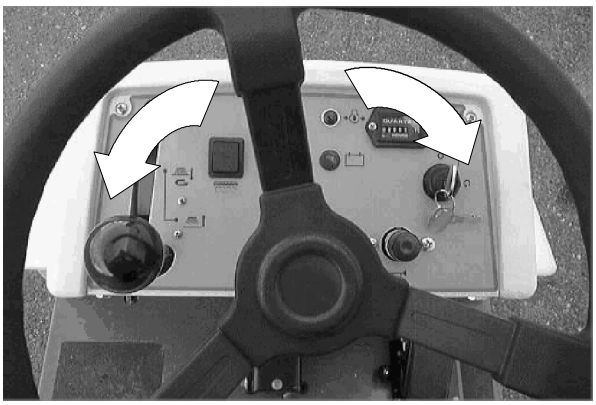
5. Locate the master link on the steering chain. Remove the master link and steering chain.



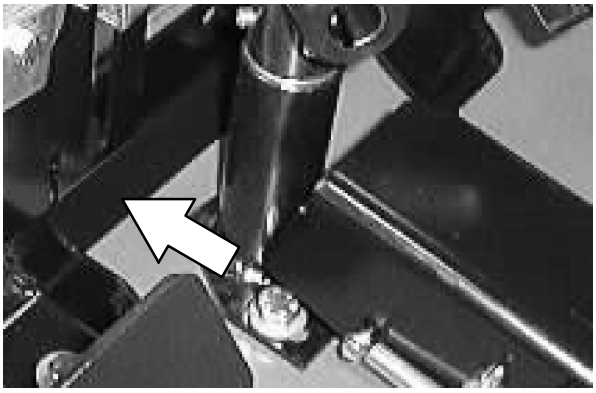
6. Position the new steering chain around both the large steering sprocket and small sprocket. Install a new master link in the new chain.



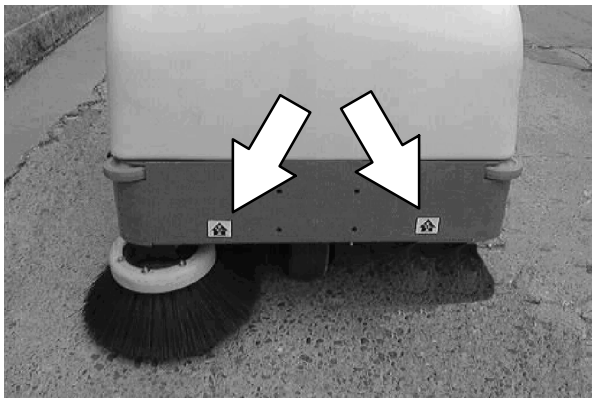
7. Turn the steering wheel all the way to the left and then to the right. Find the point in the rotation where the steering chain is the most tight.



8. Push the bearing housing forward in the slots. This will remove any excess slack in the steering chain. Tighten the two hex screws to 37 – 48 Nm (26 – 34 ft lb).



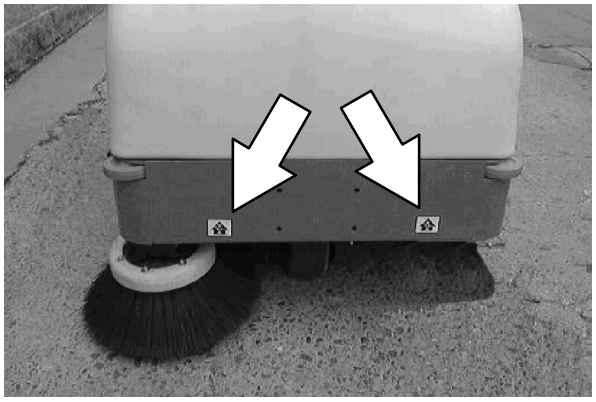
9. Remove the jack stands and lower the machine to the floor. Operate the machine and check the steering chain for proper operation.



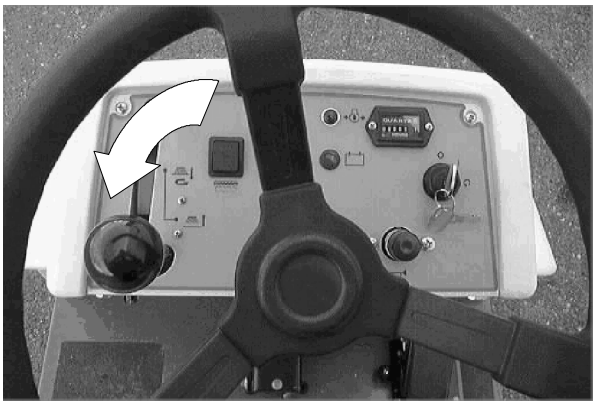
TO REPLACE STEERING HOUSING BEARINGS

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake.

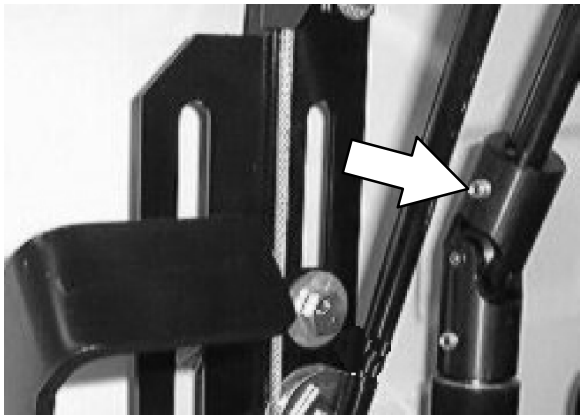
1. Jack up the front of the machine at the jack point. Install jack stands under the machine frame.



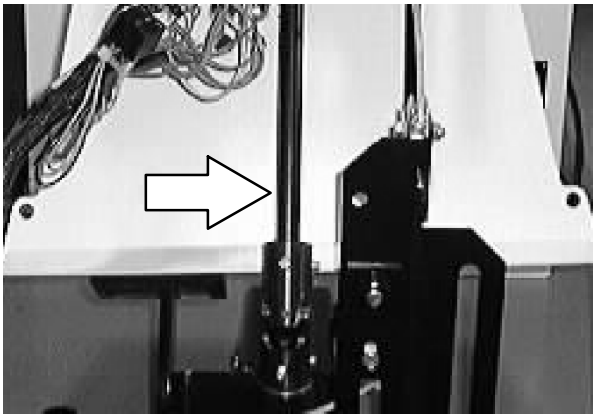
2. Turn the steering wheel all the way to the left.



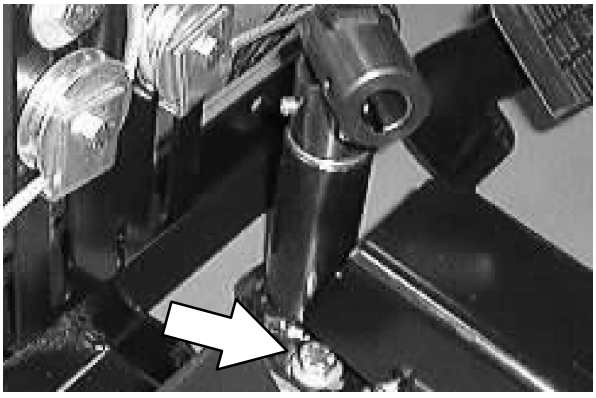
3. Go to the operators compartment and locate the steering U–joint. Loosen the two set screws on the top of the steering U–joint.



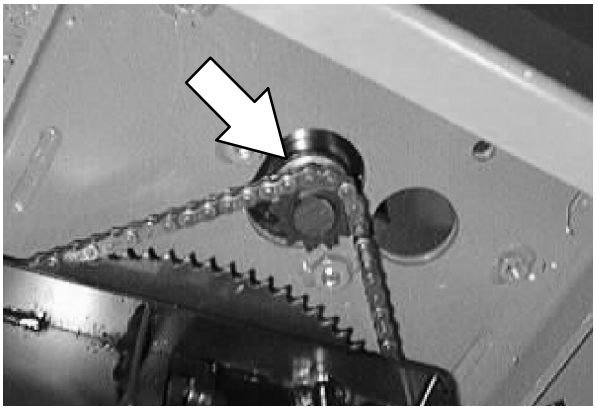
4. Pull the steering wheel and long steering shaft up and out of the top of the steering U-joint.



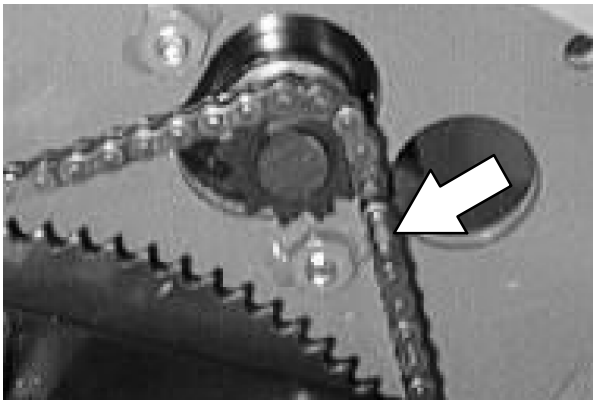
5. Remove the two hex screws holding the steering bearing housing to the machine frame. Push the bearing housing back in the slots.



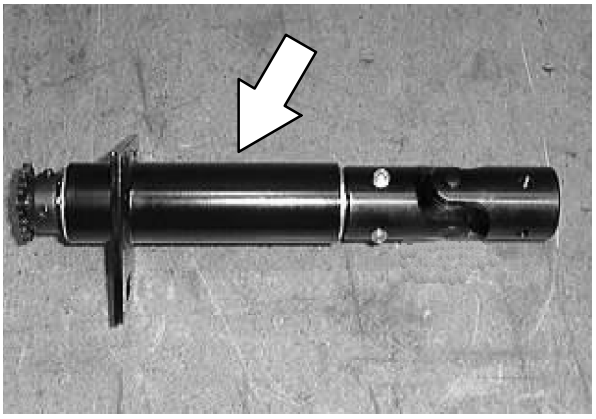
6. Go under the machine and locate the small steering chain sprocket.



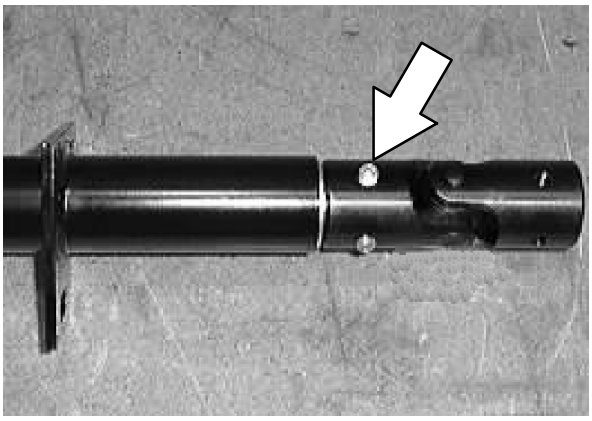
7. Locate the master link on the steering chain. Remove the master link and steering chain from the small steering sprocket.



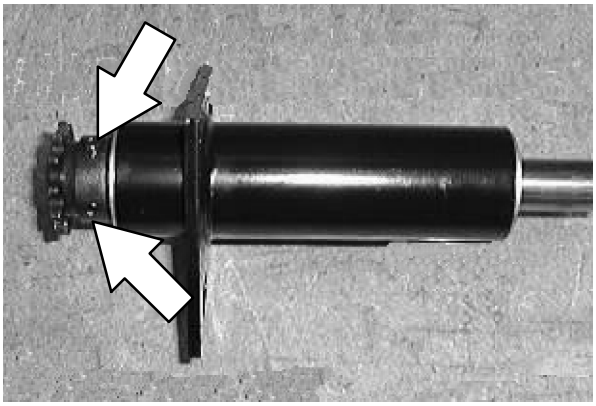
8. Remove the steering housing from the machine.



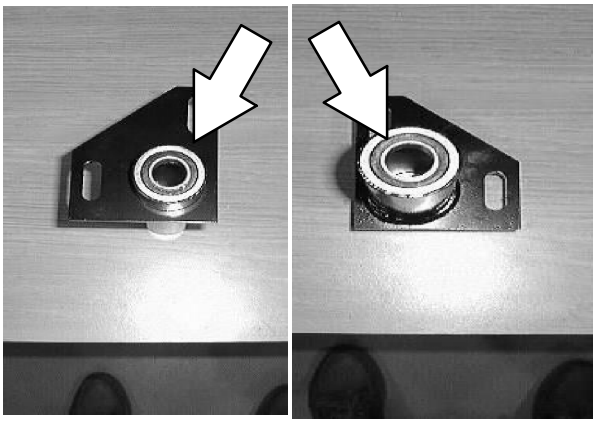
9. Loosen the two set screws holding the U-joint to the top of the short steering shaft. Remove and retain the U-joint and square key.



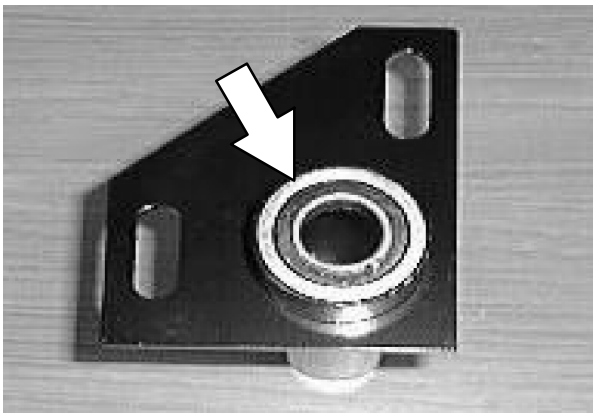
10. Loosen the set screw holding the small steering sprocket to the bottom of the short steering shaft. Remove and retain small sprocket and woodruff key.



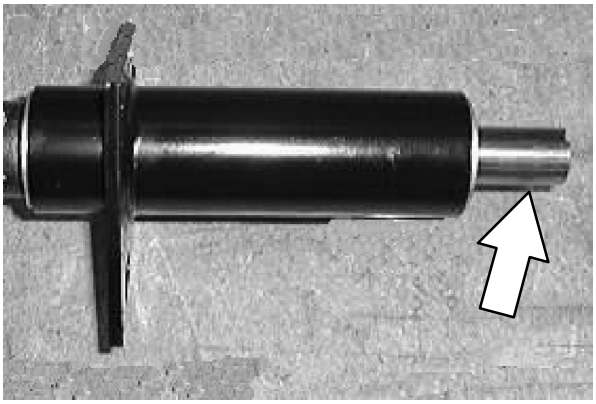
11. Use an arbor press to press the short steering shaft and two bearings out of the housing. Discard the bearings. Retain the short shaft. *Note the orientation of the shaft in the housing.*



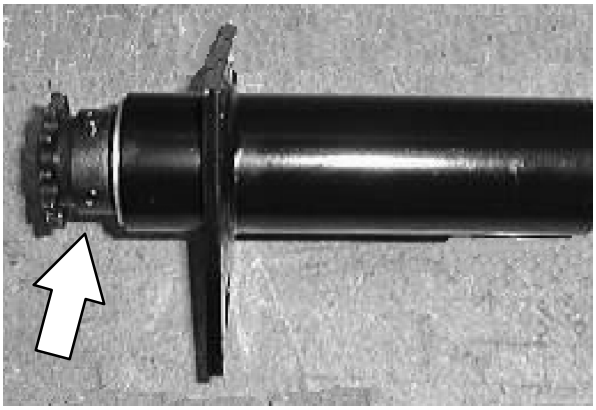
12. Use the arbor press to install the new bearings into the steering housing.



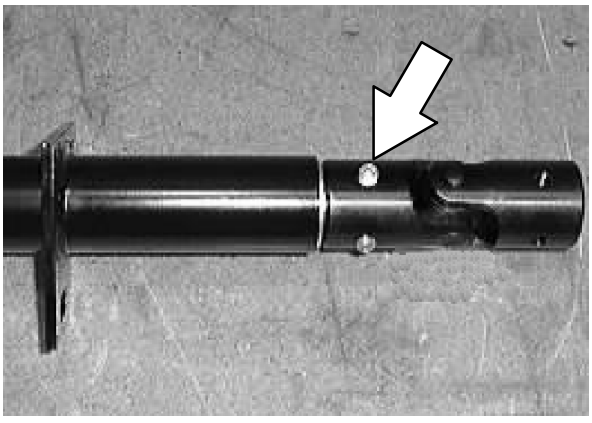
13. Use the arbor press to install the short steering shaft into the new bearings.



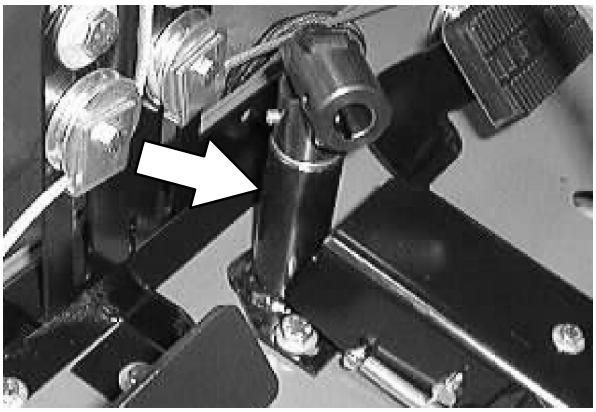
14. Reinstall the small steering sprocket and woodruff key on the bottom of the steering housing. Tighten the set screws tight.



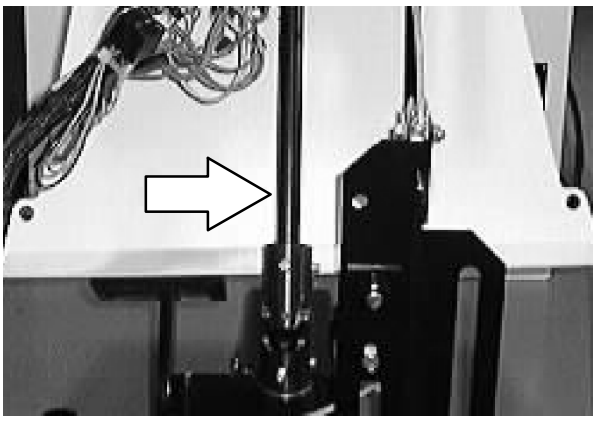
15. Reinstall the U-joint and square key on the top of the steering housing. Tighten the set screws tight.



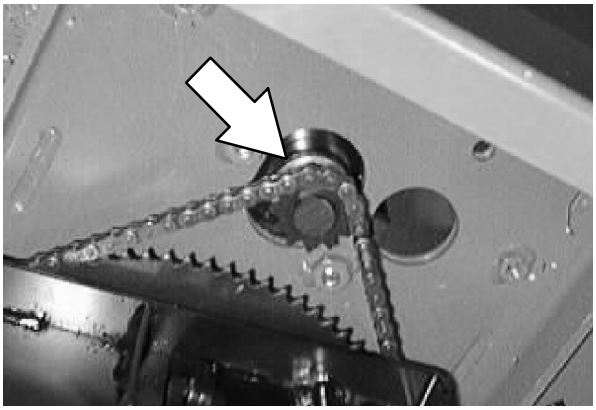
16. Reinstall the steering housing in the machine. Reinstall the two hex screws. Leave loose for now.



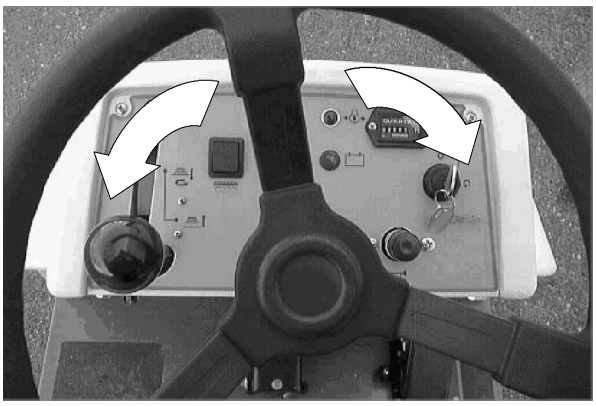
17. Position the long steering shaft and steering wheel into the top of the steering U-joint. Tighten the set screws tight.



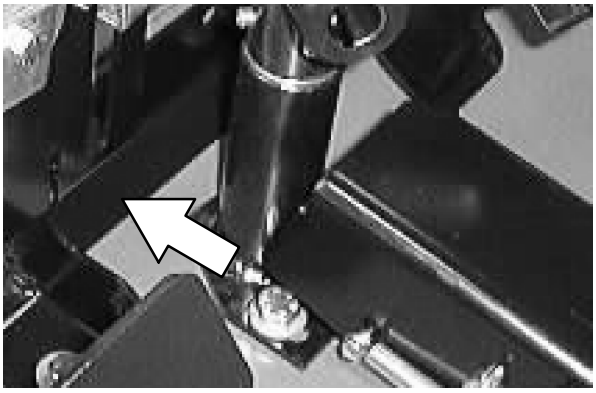
18. Go under the machine and reinstall the steering chain around the small steering sprocket. Reinstall the master link.



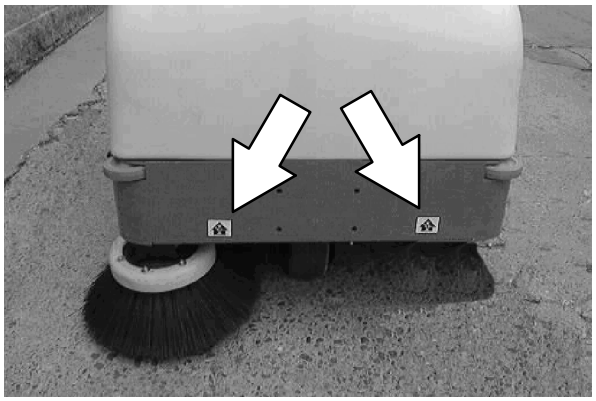
19. Turn the steering wheel all the way to the left and then to the right. Find the point in the rotation where the steering chain is the most tight.



20. Push the bearing housing forward in the slots. This will remove any excess slack in the steering chain. Tighten the two hex screws to 37 – 48 Nm (26 – 34 ft lb).



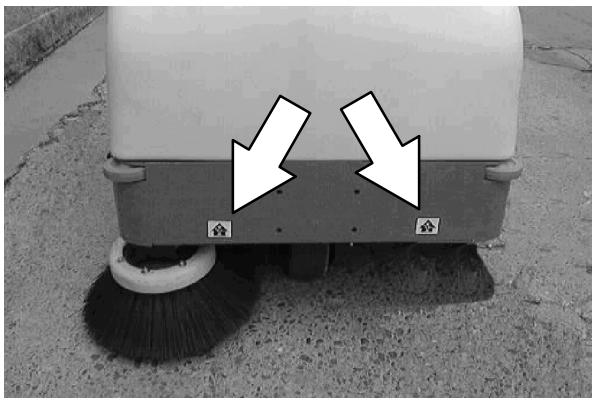
21. Remove the jack stands and lower the machine to the floor. Operate the machine and check the steering chain for proper operation.



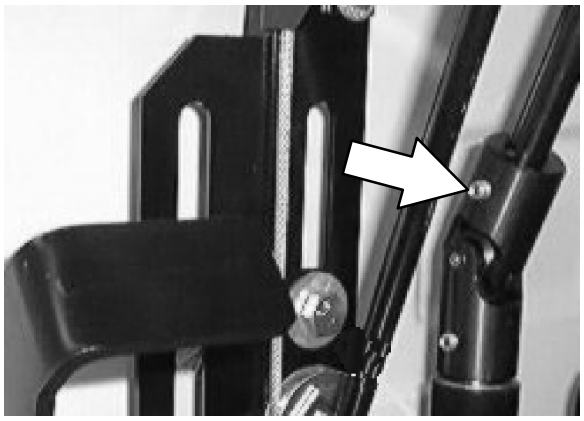
TO REPLACE STEERING U-JOINT

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake.

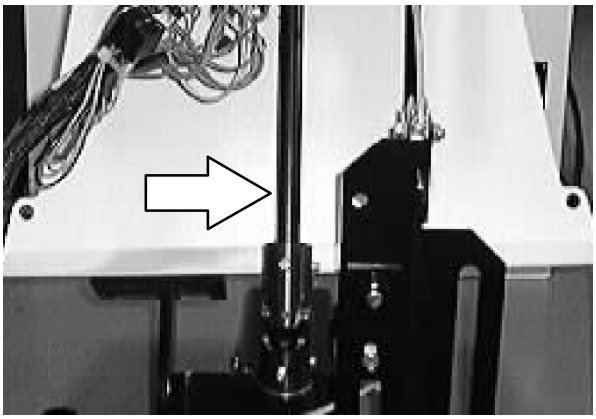
1. Jack up the front of the machine at the jack point. Install jack stands under the machine frame.



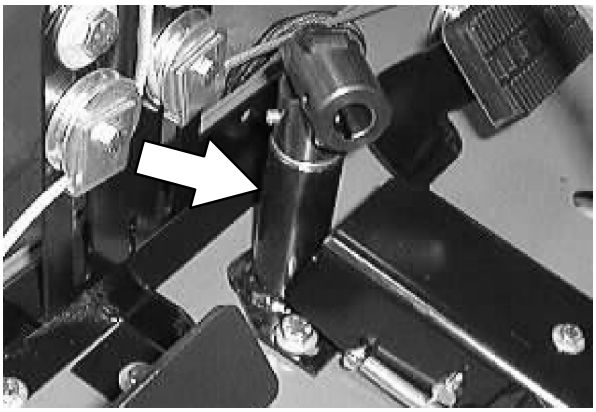
2. Go to the operators compartment and locate the steering U-joint. Loosen the two set screws on the top of the steering U-joint.



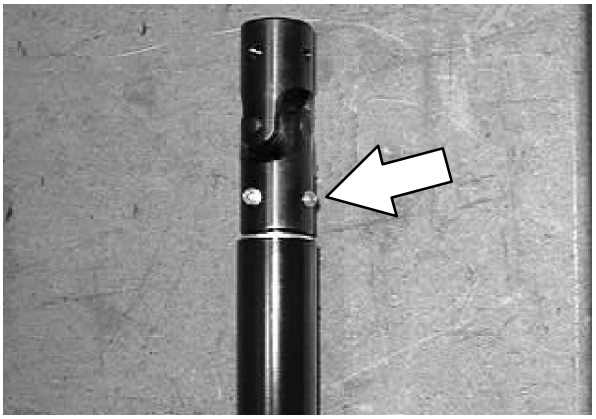
3. Pull the steering wheel and long steering shaft up and out of the top of the steering U-joint.



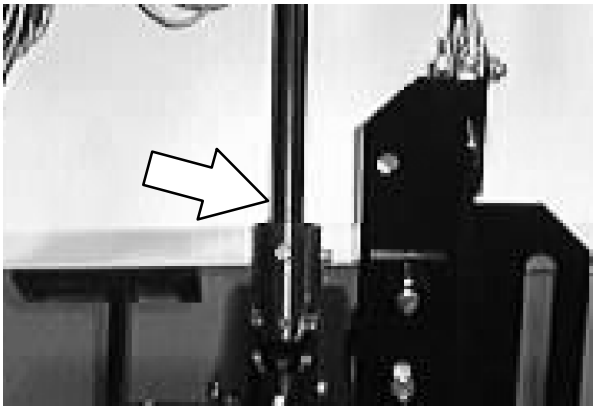
4. Loosen the two set screws holding the U-joint to the top of the short steering shaft. Remove and discard the U-joint and square key.



5. Install the new U-joint and square key on the top of the steering housing. Tighten the set screws tight.



6. Position the long steering shaft and steering wheel into the top of the steering U-joint. Tighten the set screws tight.

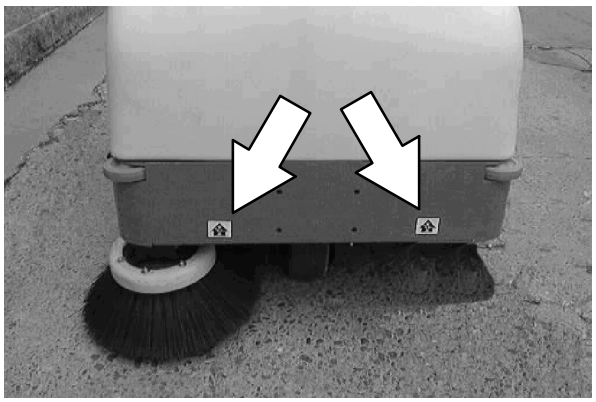


7. Operate the machine and check the steering U-joint for proper operation.

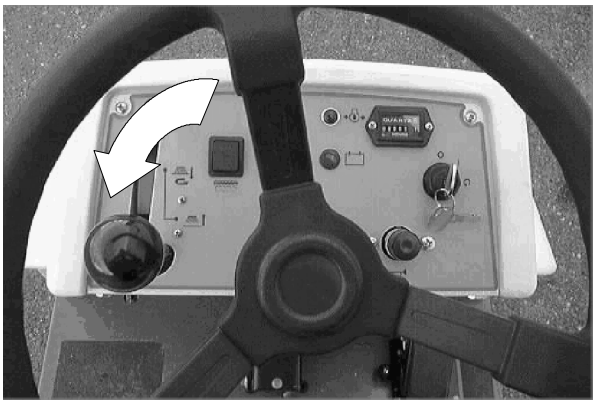
TO REPLACE SMALL STEERING SPROCKET

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake.

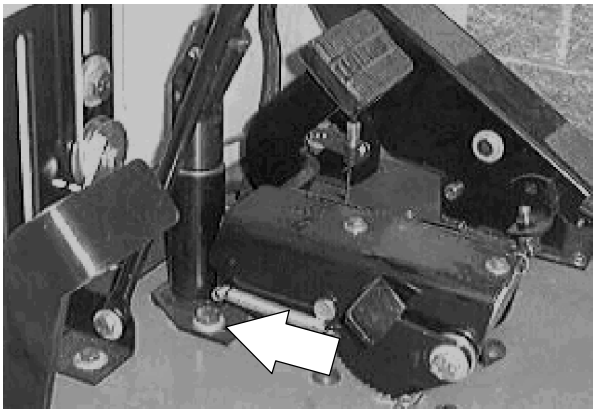
1. Jack up the front of the machine at the jack point. Install jack stands under the machine frame.



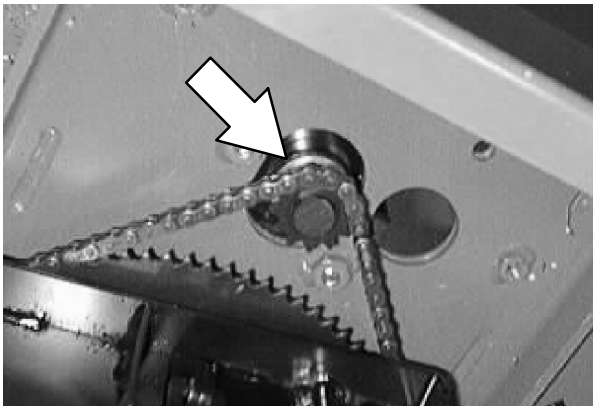
2. Turn the steering wheel all the way to the left.



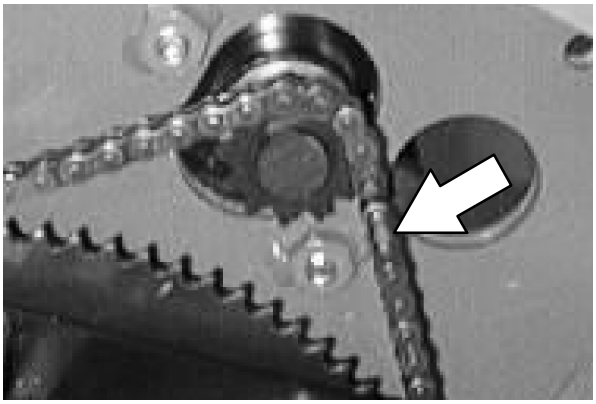
3. Go to the operators compartment and locate the two hex screws holding the steering bearing housing to the machine frame. Loosen the two screws and push the bearing housing back in the slots. *This will loosen the steering chain.*



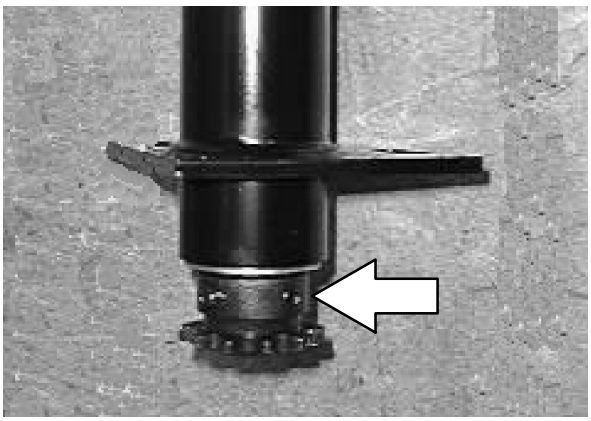
4. Go under the machine and locate the small steering chain sprocket.



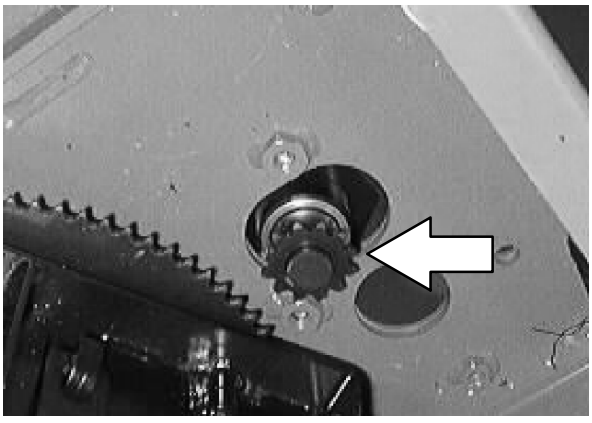
5. Locate the master link on the steering chain. Remove the master link from the steering chain.



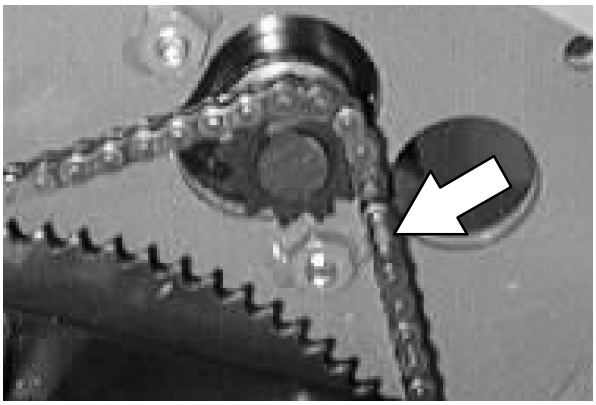
6. Loosen the set screw holding the small steering sprocket to the bottom of the short steering shaft. Remove and discard the small sprocket. Retain the woodruff key.



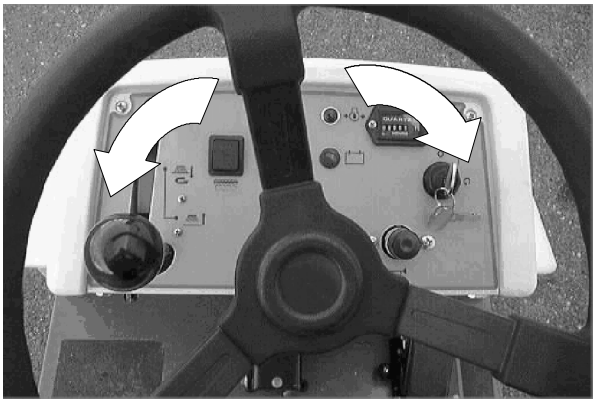
7. Install the new small sprocket and woodruff key onto the steering shaft. The teeth of the new sprocket face down. Position the sprocket in the same location as the old one. Tighten the two set screws tight.



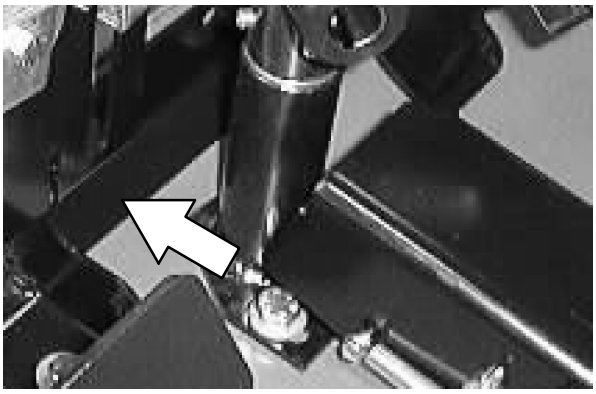
8. Place the steering chain around the new sprocket. Reinstall the master link.



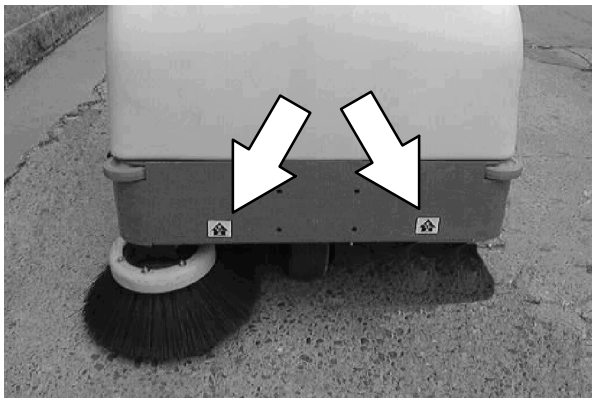
9. Turn the steering wheel all the way to the left and then to the right. Find the point in the rotation where the steering chain is the most tight.



10. Push the bearing housing forward in the slots. This will remove any excess slack in the steering chain. Tighten the two hex screws to 37 – 48 Nm (26 – 34 ft lb).



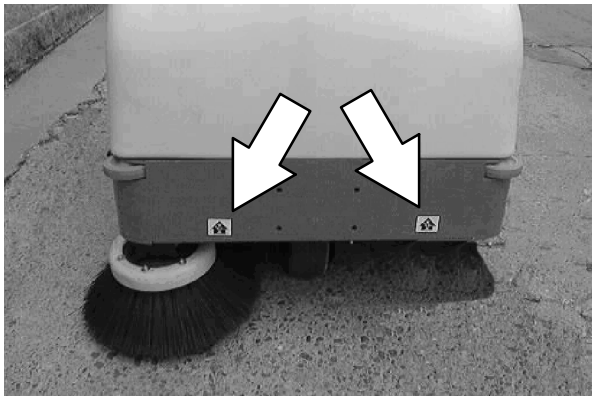
11. Remove the jack stands and lower the machine to the floor. Operate the machine and check the steering for proper operation.



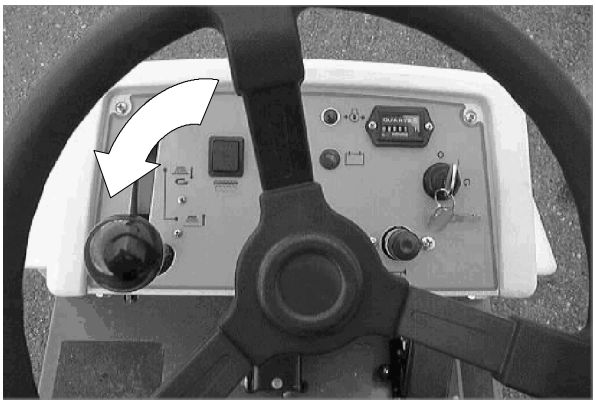
TO REPLACE LARGE STEERING SPROCKET

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, place blocks in front and back of the rear tires.

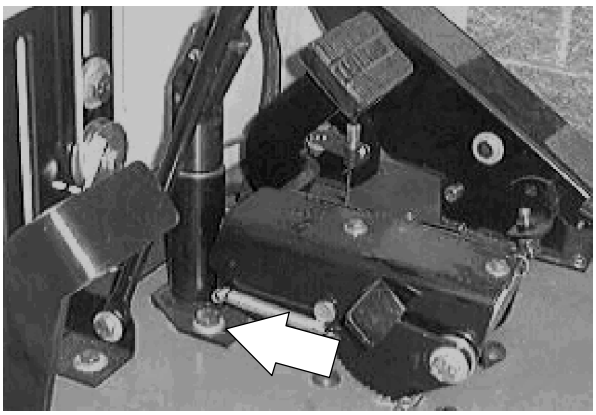
1. Jack up the front of the machine at the jack point. Install jack stands under the machine frame.



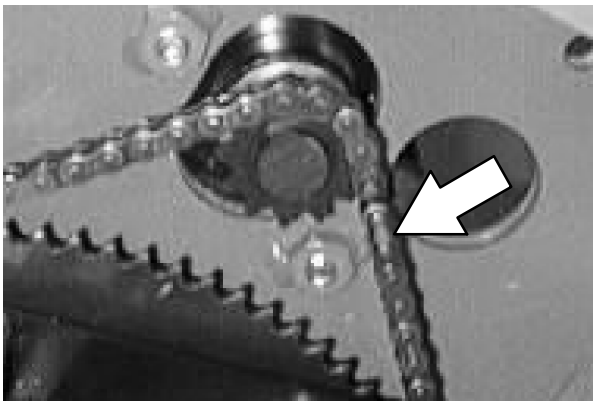
2. Turn the steering wheel all the way to the left.



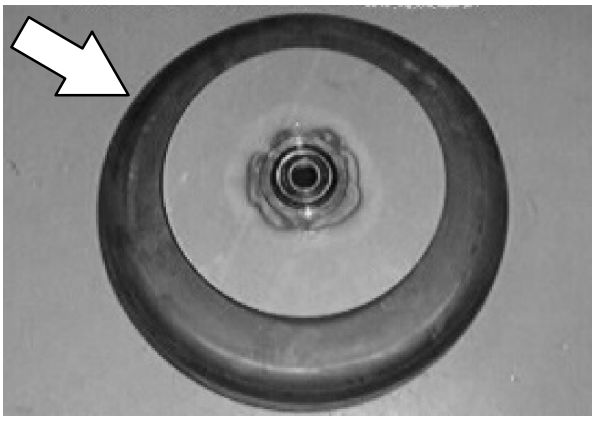
3. Go to the operators compartment and locate the two hex screws holding the steering bearing housing to the machine frame. Loosen the two screws and push the bearing housing back in the slots. *This will loosen the steering chain.*



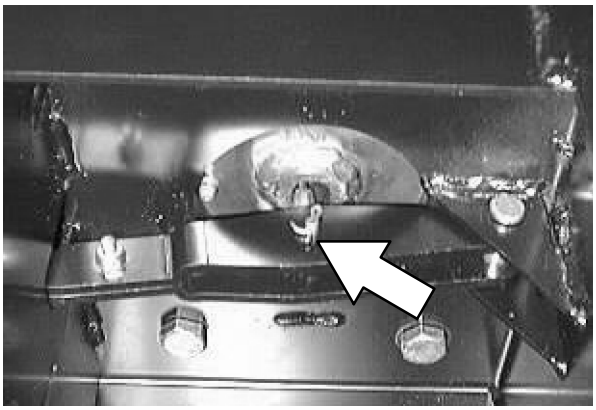
4. Locate the master link on the steering chain. Remove the master link from the steering chain. Remove the steering chain from the machine.



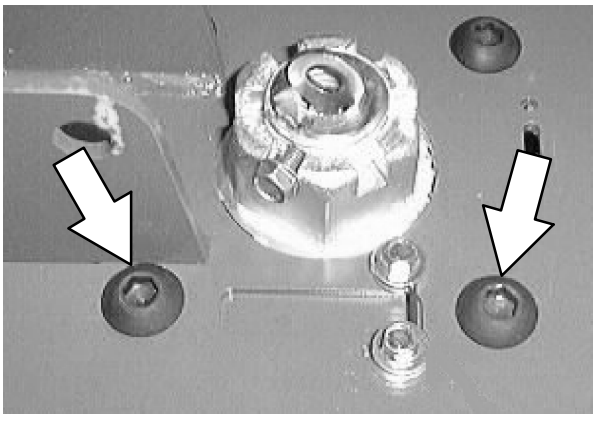
5. Remove the front tire assembly. See TO REMOVE FRONT TIRE AND WHEEL instructions in this section.



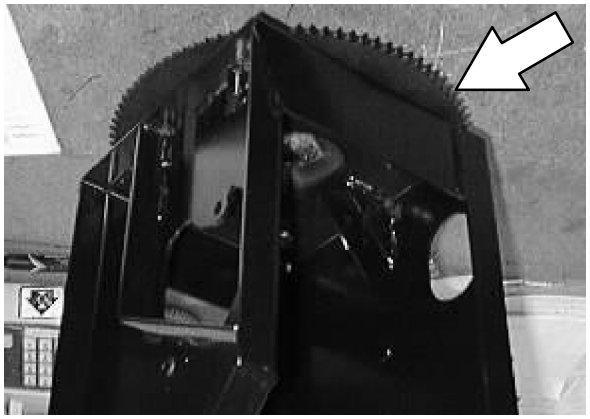
6. Go under the machine and locate the short brake rod coming through the center of the wheel support bearing assembly. Disconnect the clevis end of the short brake cable where it attaches to the brake lever.



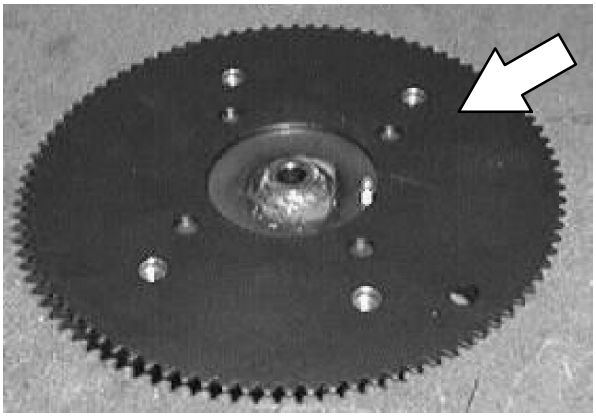
7. Remove the four hex screws holding the wheel support and large sprocket to the pivot bearing assembly. Drop the wheel support and large sprocket out of the machine.



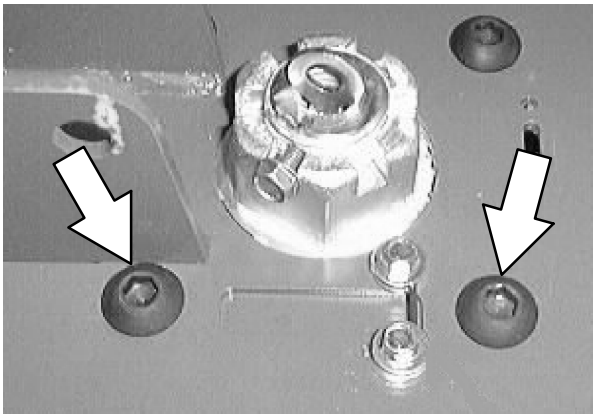
8. Remove the large sprocket from the wheel support. Discard the sprocket.



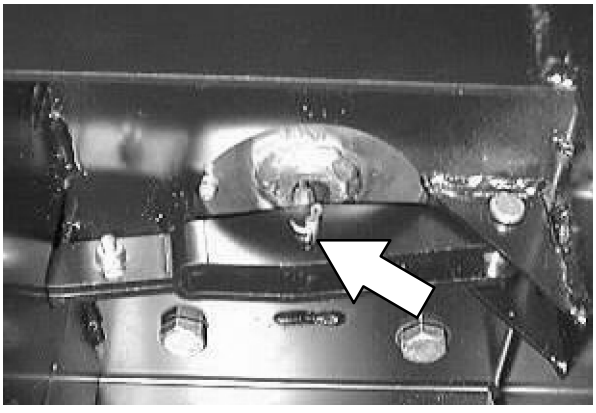
9. Position the new large steering sprocket onto the wheel support. Make sure the locating pin on the wheel support is inserted in the locating pin hole in the new sprocket.



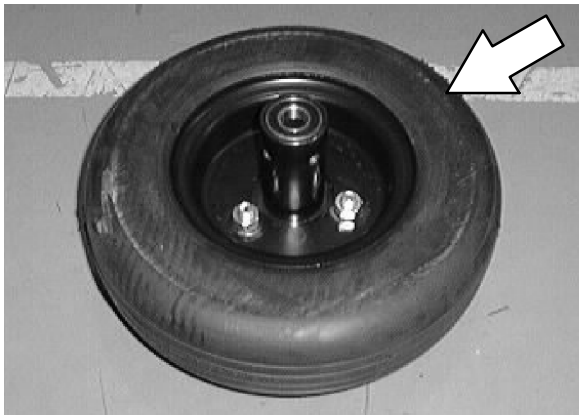
10. Position the wheel support and sprocket assembly into the machine. Line up the mount holes in the wheel support and sprocket with the threaded holes in the bottom of the pivot bearing assembly. Reinstall the four screws and tighten to 64 – 83 Nm (47 – 61 ft lb).



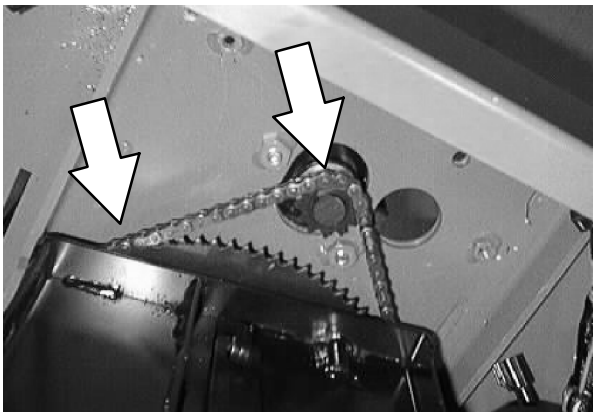
11. Reconnect the short brake rod to the brake lever.



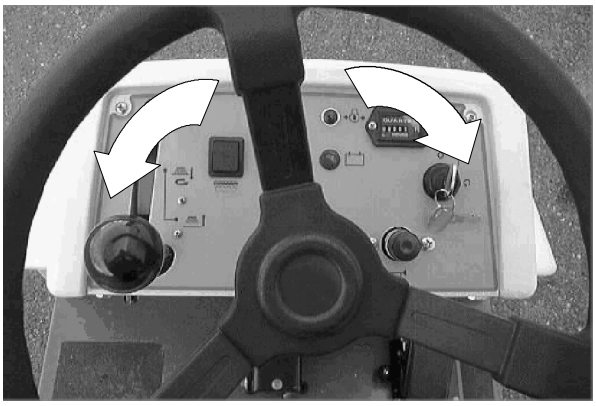
12. Reinstall the front wheel assembly. See TO INSTALL FRONT TIRE AND WHEEL instructions in this section.



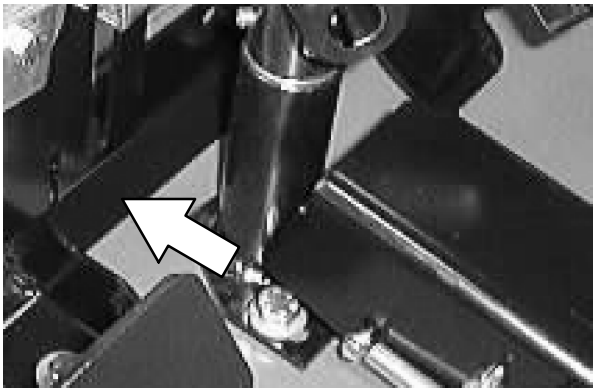
13. Reinstall the steering chain onto both steering sprockets. Reinstall the master link.



14. Turn the steering wheel all the way to the left and then to the right. Find the point in the rotation where the steering chain is the most tight.



15. Push the bearing housing forward in the slots. This will remove any excess slack in the steering chain. Tighten the two hex screws to 37 – 48 Nm (26 – 34 ft lb).

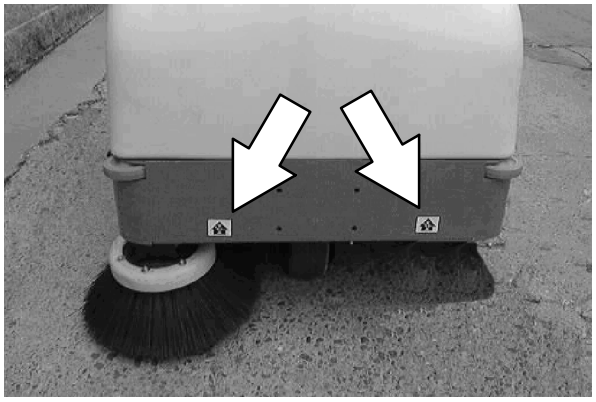


16. Remove the jack stands and lower the machine to the floor. Operate the machine and check the steering for proper operation.

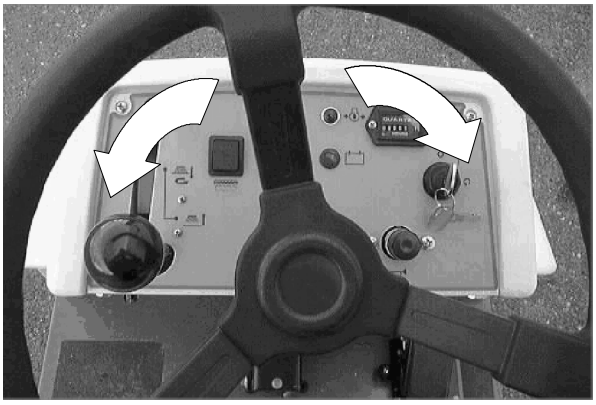
TO REPLACE FRONT WHEEL HOUSING NEEDLE BEARING/THRUST WASHERS

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, place blocks in front and back of the rear tires.

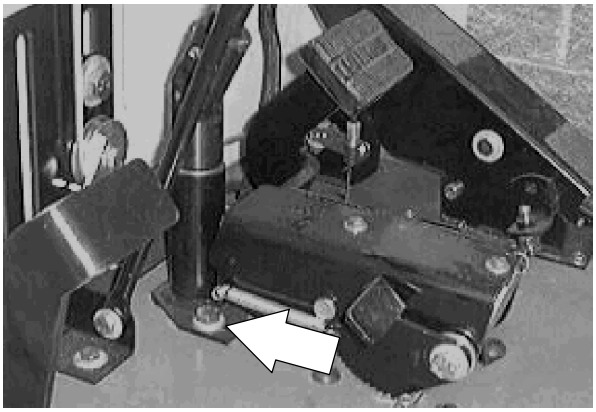
1. Jack up the front of the machine at the jack point. Install jack stands under the machine frame.



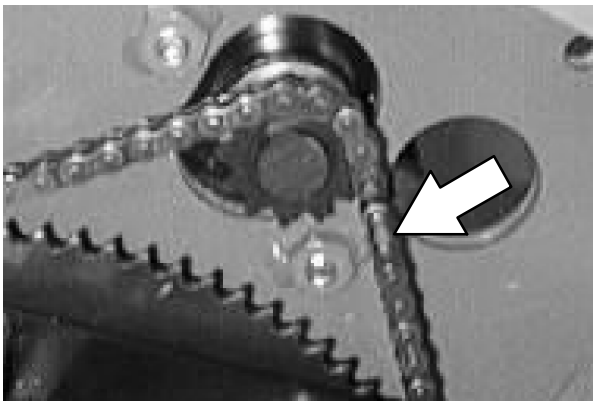
2. Turn the steering wheel all the way to the left.



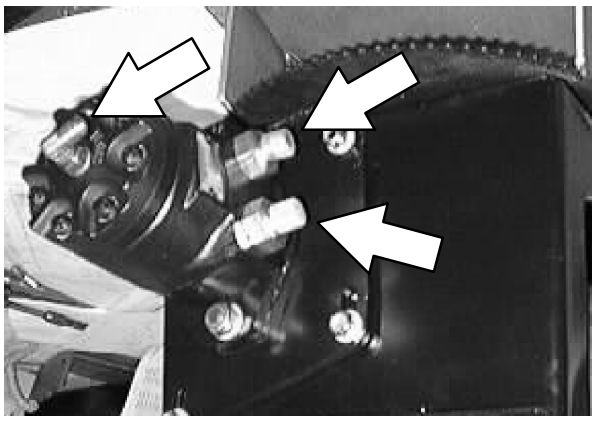
3. Go to the operators compartment and locate the two hex screws holding the steering bearing housing to the machine frame. Loosen the two screws and push the bearing housing back in the slots. *This will loosen the steering chain.*



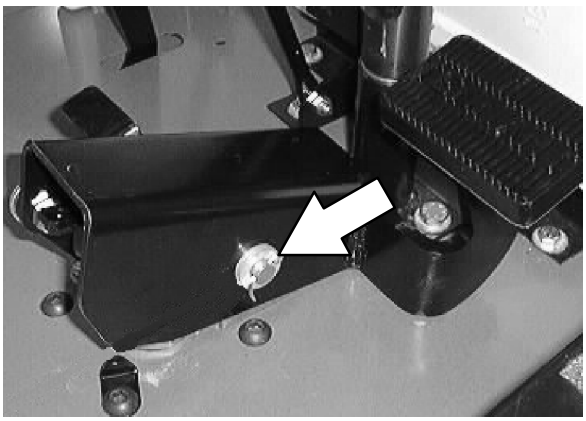
4. Locate the master link on the steering chain. Remove the master link from the steering chain. Remove the steering chain from the machine.



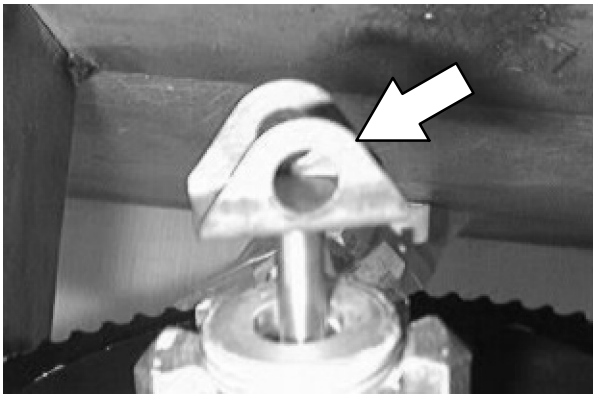
5. Mark, disconnect, and plug the hydraulic hoses leading to the drive motor.



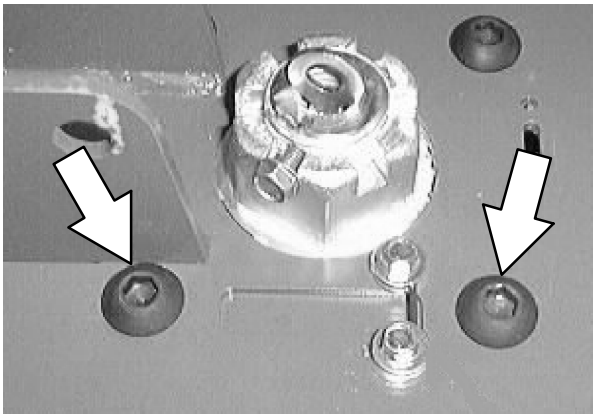
6. Go to the operators compartment and locate the clevis pin holding the brake pedal assembly to the floor plate. Remove the clevis pin and tension spring from the brake pedal.



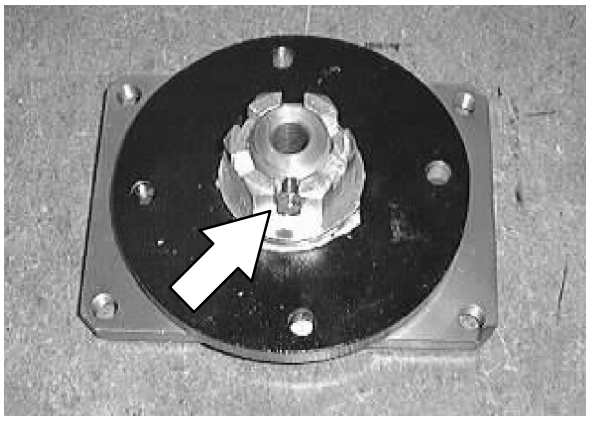
7. Pull the brake pedal up and disconnect the clevis end of the short brake rod where it attaches to the brake pedal assembly.



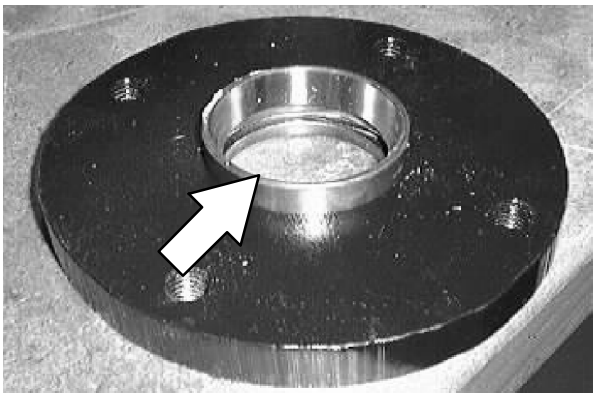
8. Support the front drive assembly with a jack or blocks. Remove the four button head screws holding the front drive assembly in the machine. Lower the drive assembly down and out of the machine.



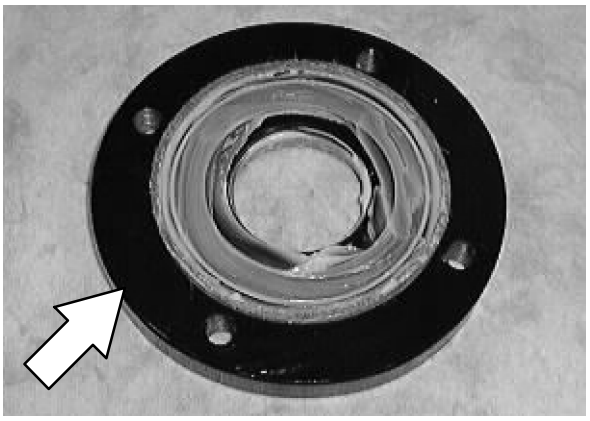
9. Remove the small thread roller screw holding the castle nut to the pivot shaft. Remove the castle nut and flat washer.



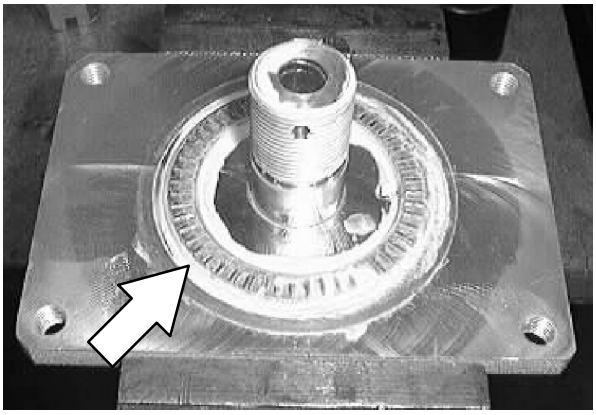
10. Pull the cone bearing out of the swivel plate.



11. Pull the swivel plate off the swivel plate weldment. Make sure to retain the rubber seal ring.



12. Remove and discard the upper thrust washer. Remove and discard the needle bearing and lower thrust washer.

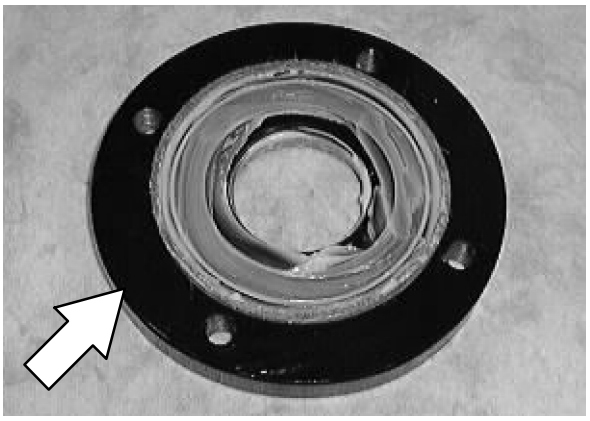


13. Install the new thrust washer onto the swivel plate weldment.

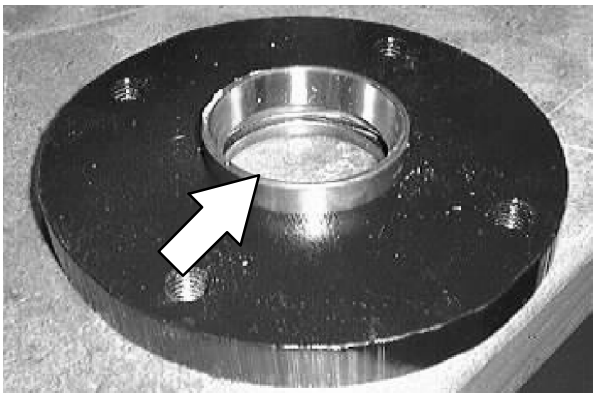
14. Grease the new needle bearing and position on top of the new thrust washer. Install the second thrust washer on top of the needle bearing.

15. Reinstall the swivel plate onto the swivel plate weldment.

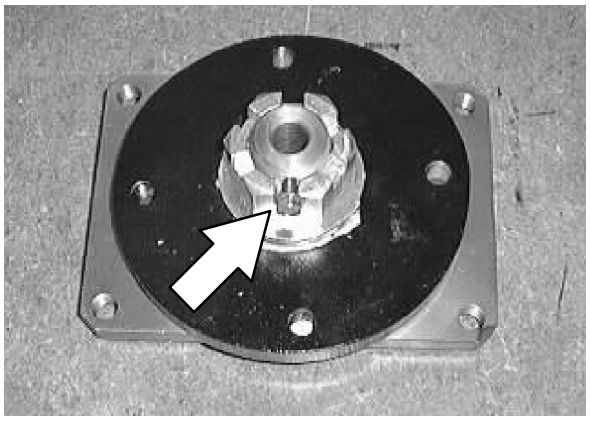
NOTE: Make sure the rubber seal ring is in place on the swivel plate before installing.



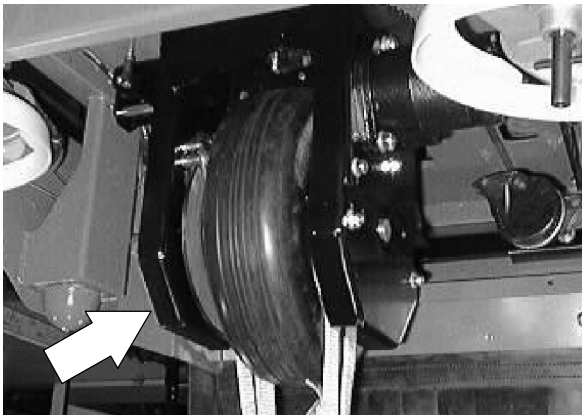
16. Reinstall the cone bearing in the swivel plate. *Grease the bearing if needed.*



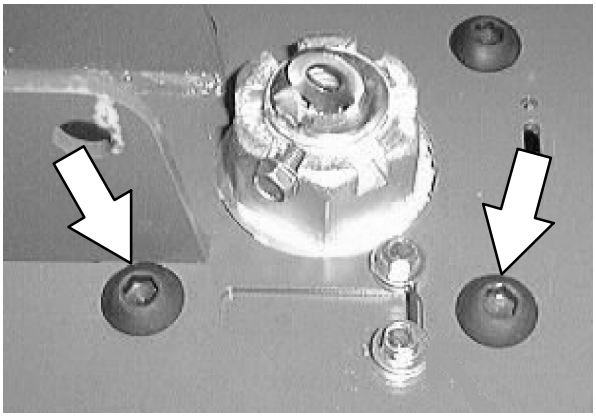
17. Reinstall the large flat washer and castle nut. Tighten to 37 – 48 Nm (26 – 34 ft. lb). Reinstall the small thread roller into the cross hole. *Back off the castle nut if needed to align cross hole.*



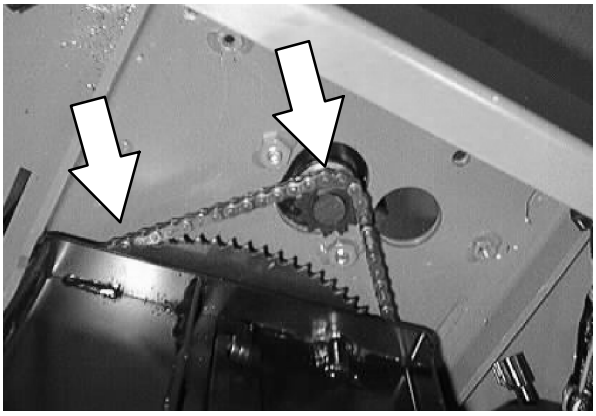
18. Use a floor jack to reinstall the front drive assembly in the machine.



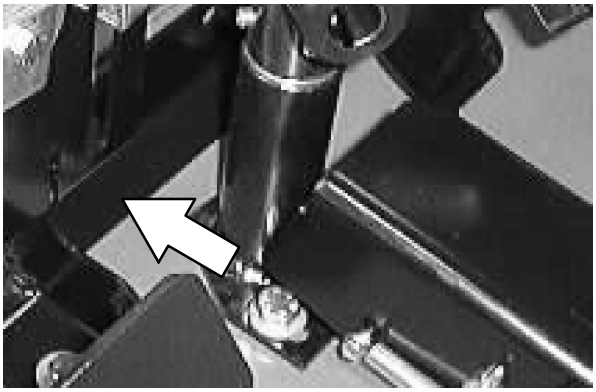
19. Line up the four threaded holes in the swivel plate weldment with the mount holes in the machine frame. Reinstall the four button head screws and tighten to 64 – 83 Nm (47 – 61 ft lb). *Make sure the drive motor is facing the front of the machine.*



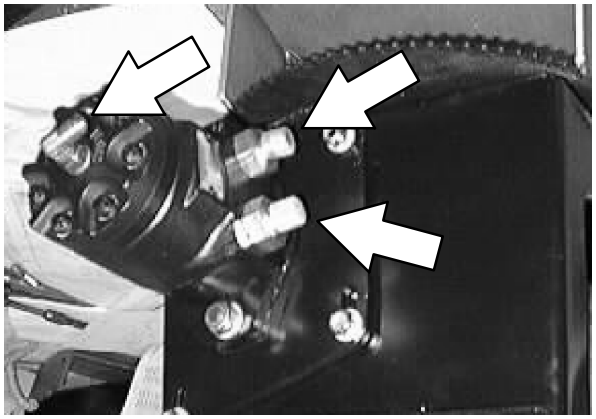
20. Reinstall the steering chain onto both steering sprockets. Reinstall the master link.



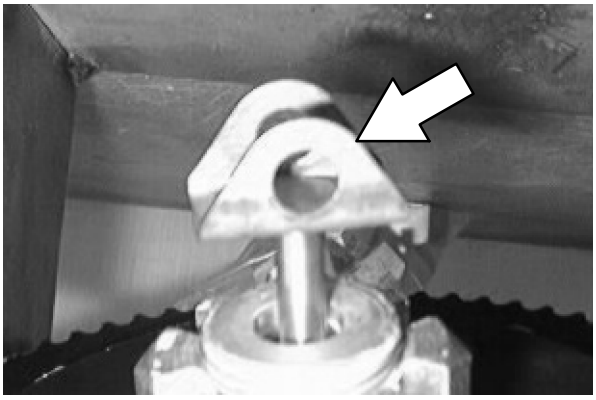
21. Go back to the operators compartment. Push the steering housing forward in the slots. This will remove any slack in the steering chain. Tighten the two hex screws to 37 – 48 Nm (26 – 34 ft lb).



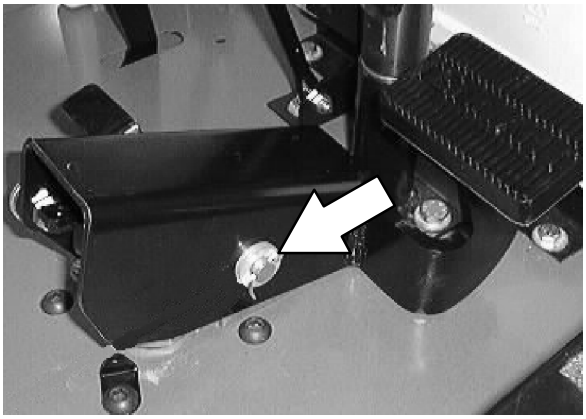
22. Reconnect the hydraulic hoses to the drive motor.



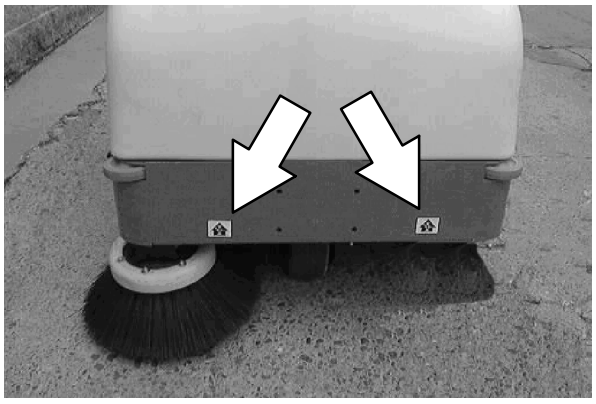
23. Reconnect the short brake rod to the brake pedal.



24. Reinstall the brake pedal and clevis pin.



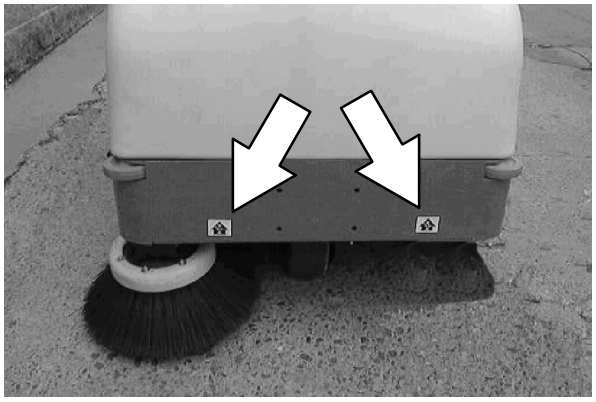
25. Remove the jack stands and lower the machine to the floor. Operate the machine and check the steering for proper operation.



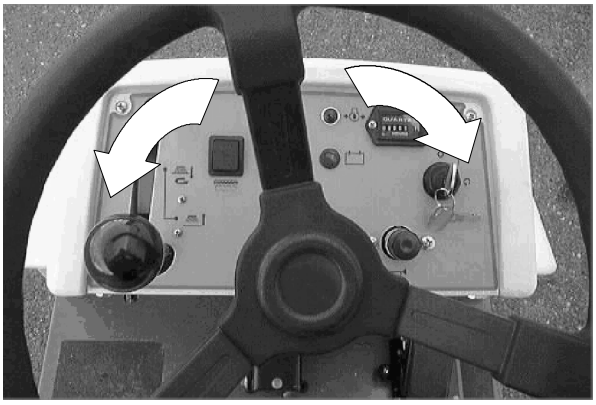
TO REPLACE FRONT WHEEL HOUSING CONE BEARING

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, place blocks in front and back of the rear tires.

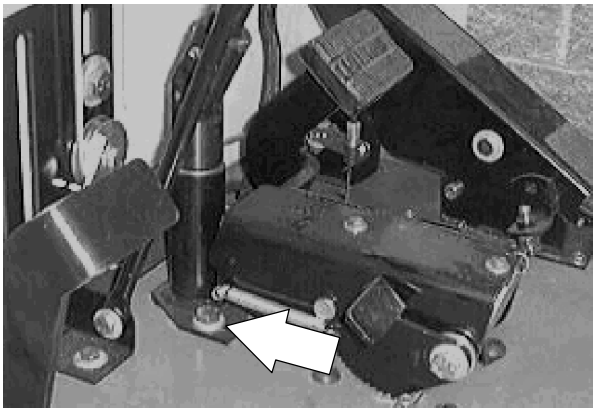
1. Jack up the front of the machine at the jack point. Install jack stands under the machine frame.



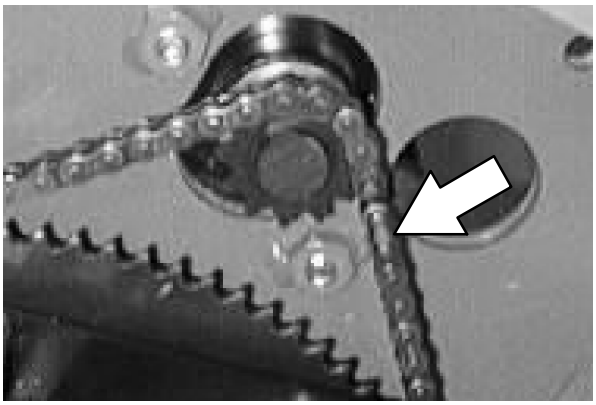
2. Turn the steering wheel all the way to the left.



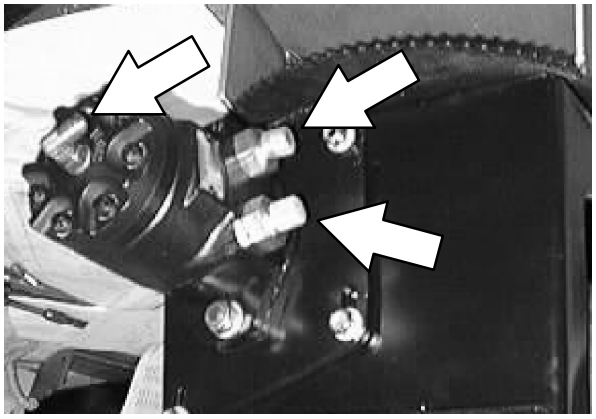
3. Go to the operators compartment and locate the two hex screws holding the steering bearing housing to the machine frame. Loosen the two screws and push the bearing housing back in the slots. *This will loosen the steering chain.*



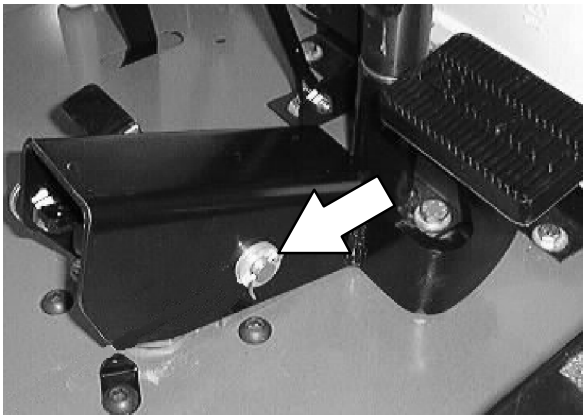
4. Locate the master link on the steering chain. Remove the master link from the steering chain. Remove the steering chain from the machine.



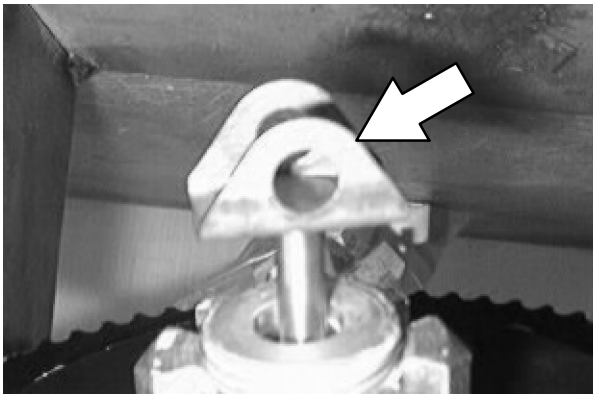
5. Mark, disconnect, and plug the hydraulic hoses leading to the drive motor.



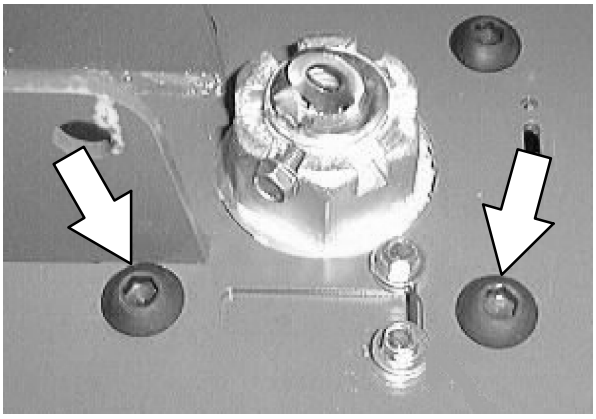
6. Go to the operators compartment and locate the clevis pin holding the brake pedal assembly to the floor plate. Remove the clevis pin and tension spring from the brake pedal.



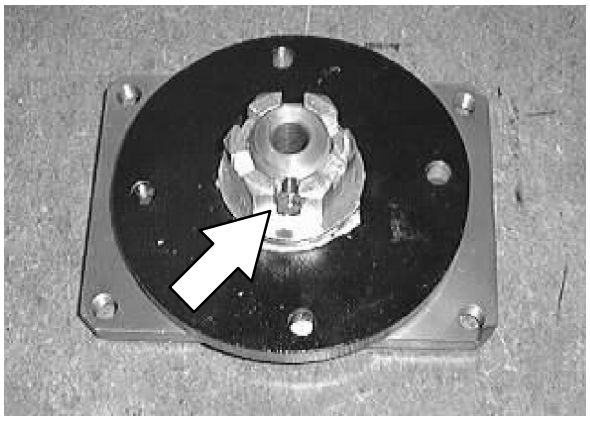
7. Pull the brake pedal up and disconnect the clevis end of the short brake rod where it attaches to the brake pedal assembly.



8. Support the front drive assembly with a jack or blocks. Remove the four button head screws holding the front drive assembly in the machine. Lower the drive assembly down and out of the machine.

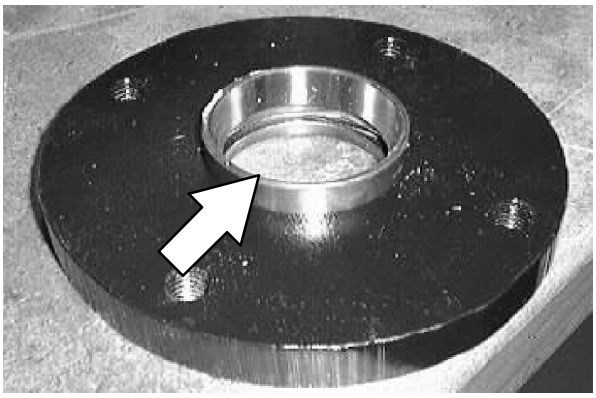


9. Remove the small thread roller screw holding the castle nut to the pivot shaft. Remove the castle nut and flat washer.

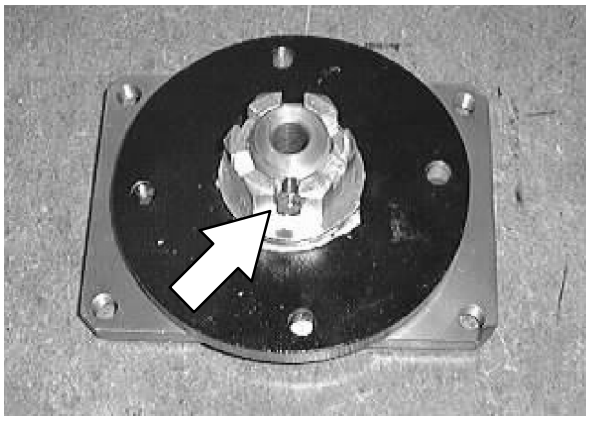


10. Pull the cone bearing out of the swivel plate.

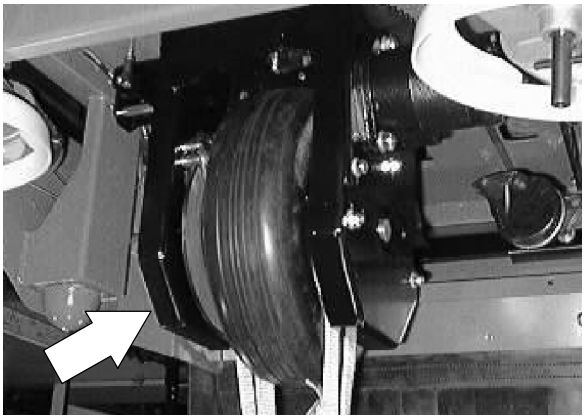
11. Grease the new cone bearing. Reinstall the cone bearing into the swivel plate.



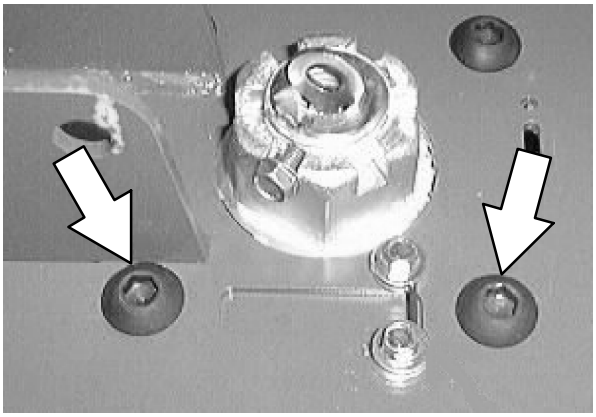
12. Reinstall the large flat washer and castle nut. Tighten to 37 – 48 Nm (26 – 34 ft. lb). Reinstall the small thread roller into the cross hole. *Back off the castle nut if needed to align cross hole.*



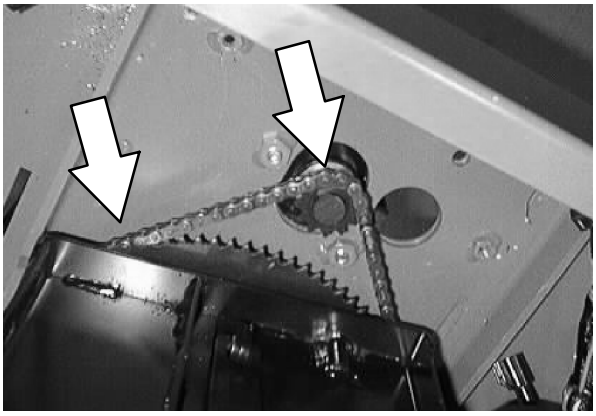
13. Use a floor jack to reinstall the front drive assembly in the machine.



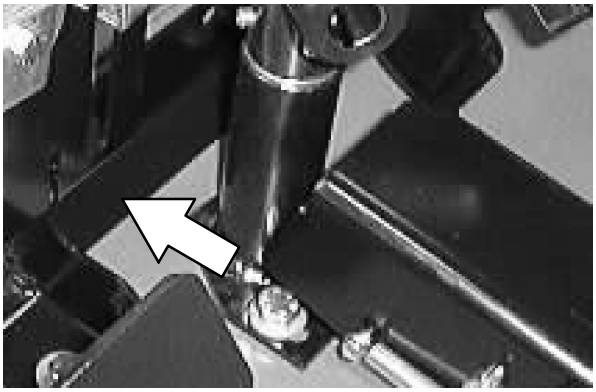
14. Line up the four threaded holes in the swivel plate weldment with the mount holes in the machine frame. Reinstall the four button head screws and tighten to 64 – 83 Nm (47 – 61 ft lb). *Make sure the drive motor is facing the front of the machine.*



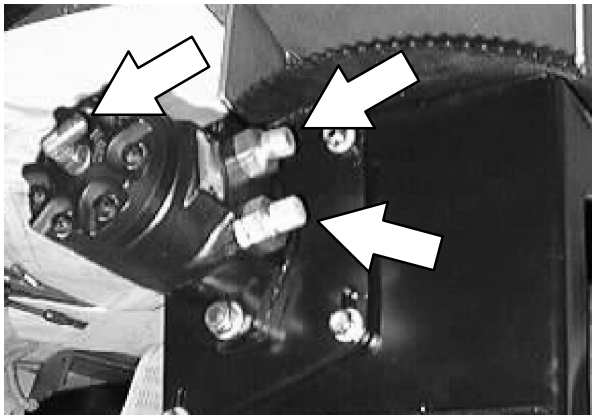
15. Reinstall the steering chain onto both steering sprockets. Reinstall the master link.



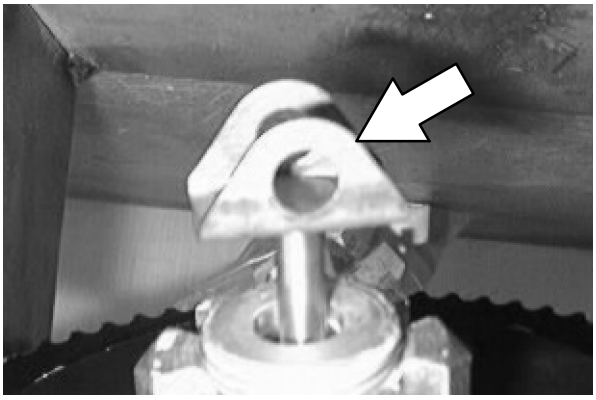
16. Go back to the operators compartment. Push the steering housing forward in the slots. This will remove any slack in the steering chain. Tighten the two hex screws to 37 – 48 Nm (26 – 34 ft lb).



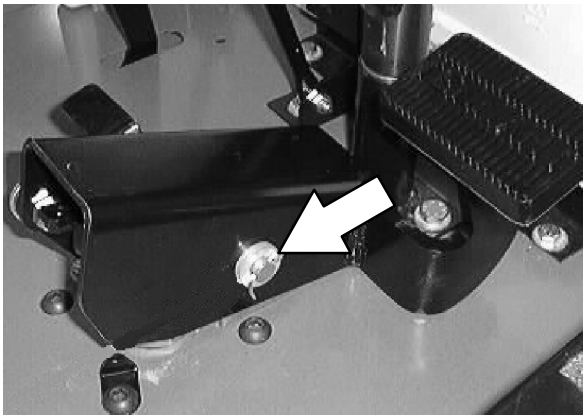
17. Reconnect the hydraulic hoses to the drive motor.



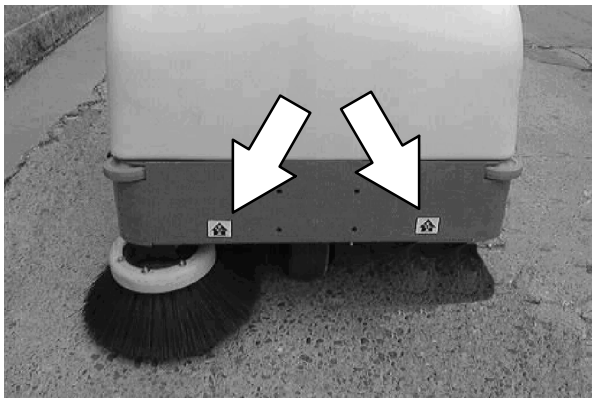
18. Reconnect the short brake rod to the brake pedal.



19. Reinstall the brake pedal and clevis pin.



20. Remove the jack stands and lower the machine to the floor. Operate the machine and check the steering for proper operation.

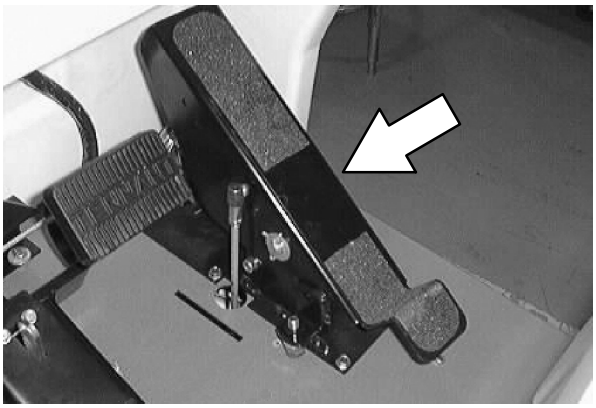


PROPEL ASSEMBLY

DIRECTIONAL PEDAL

The directional pedal is located on the right hand side of the floor plate in the operators compartment. The directional pedal is used to control the forward and reverse function of the 6100G/LP.

The directional pedal linkage is connected to the control valve located under the operators compartment floor plate.

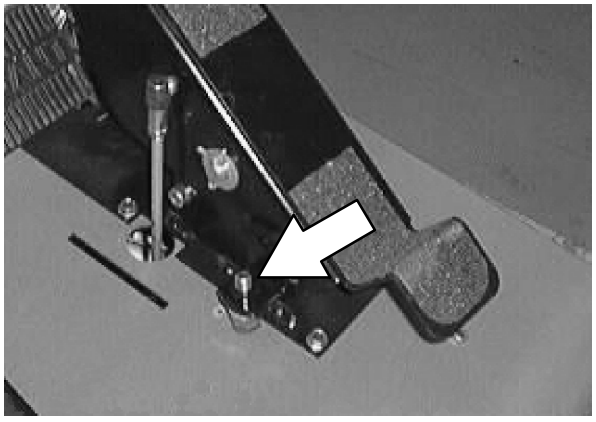


TO ADJUST DIRECTIONAL PEDAL LINKAGE

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, place blocks in front and back of the rear tires.

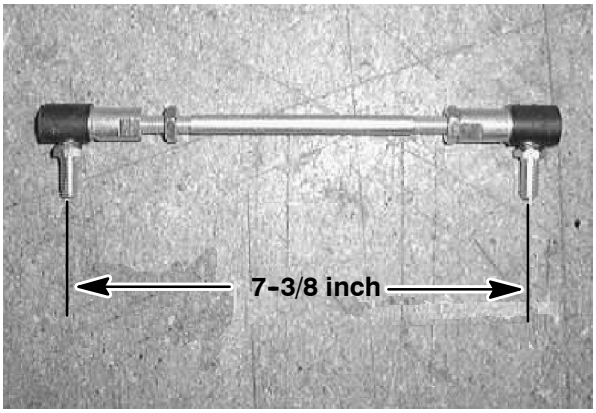
1. Check the forward and reverse speeds of the model 6100G/LP. The forward speed should be 5 mph (+/- .5 mph). The reverse speed should be 3 mph (+/- .5 mph). If either speed needs to be adjusted, go to the next step.

2. Use the hex screw on the left, back corner of the directional pedal to adjust the reverse speed.



3. To adjust the forward speed, first check the length of the threaded propel rod. The distance between the center line of the two ball joints should be 7-3/8 in.

4. Lengthen the rod to increase the forward speed, shorten the rod to decrease the forward speed.



CONTENTS

INTRODUCTION

This section includes information on the sweeping operation of the model 6100G/LP. The side brush sweeps debris in front of the machine and the main brush sweeps the debris into the hopper. The vacuum fan pulls air from the hopper and through the dust filter.

DEBRIS HOPPER

The hopper is located in the rear of the machine under the battery compartment. The hopper rolls in and out of position and rests in grooves that hold the hopper in place.

The hopper is held in operating position with a retaining clip.

NOTE: Check that the hopper retaining clip is securely in place each time before operating machine.

TO REMOVE HOPPER

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake.

1. Go to the back of the machine.

2. Grasp the hopper retainer clip. Turn the retainer clip out of the way of the hopper lip.

3. Grasp the hopper handle. Pull up slightly then pull out on the hopper.

4. Remove the hopper from the machine.

TO INSTALL HOPPER

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake.

1. Position the hopper into the back of the machine.

2. Push the hopper in until it is flush with the back of the machine frame.

3. Rotate the retainer clip down to lock the hopper in the machine.

HOPPER DUST FILTER

The Instant Access™ hopper filter filters the air pulled up from the hopper. The dust filter is equipped with a shaker to remove the accumulated dust particles. The dust filter shaker is operated by the main brush, vacuum and filter shaker switch.

Shake the dust filter before emptying the hopper and at the end of every work shift. Check and clean or replace the dust filter after every 100 hours of operation.

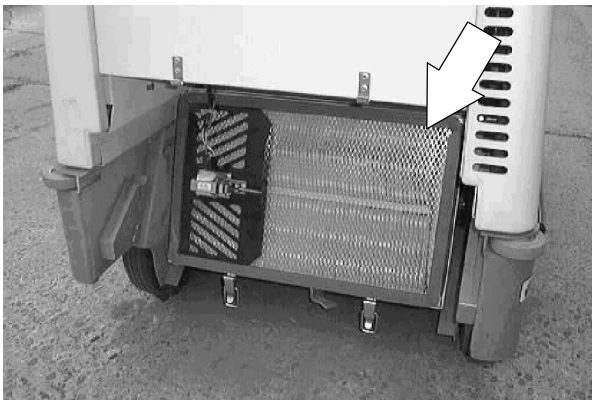
To clean the Instant Access™ filter, use one of the following methods:

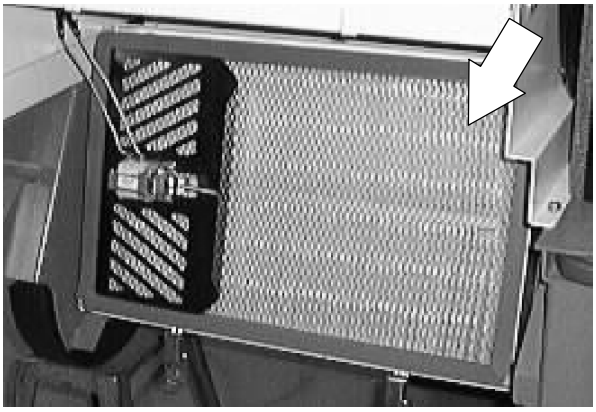
- SHAKING – Press and hold the main brush, vacuum and filter shaker switch to the **Filter shaker** position.
- TAPPING – Remove the filter and tap the filter gently on a flat surface with the dirty side down. Do not damage the edges of the filter element and seals, or the filter will not seat properly in the filter frame.
- AIR – Blow air through the dust filter, opposite the direction of the arrows. This may be done with the dust filter in the machine. Always wear eye protection when using compressed air.

  FOR SAFETY: When servicing machine, wear eye and ear protection if using pressurized air or water.

- WATER – Soak the dust filter in a water and mild detergent solution. Rinse the dust filter until it is clean. Air dry the wet dust filter; do not use compressed air to dry a wet filter.

NOTE: Be sure the dust filter is completely dry before reinstalling it in the machine.

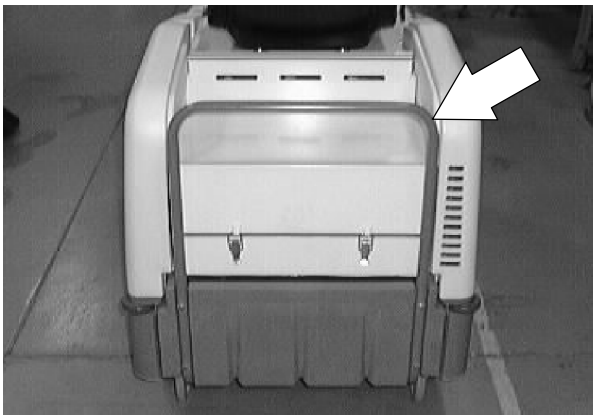




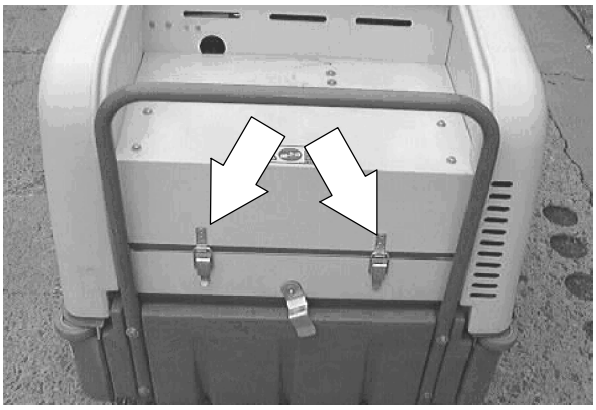
TO REPLACE HOPPER DUST FILTER

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake.

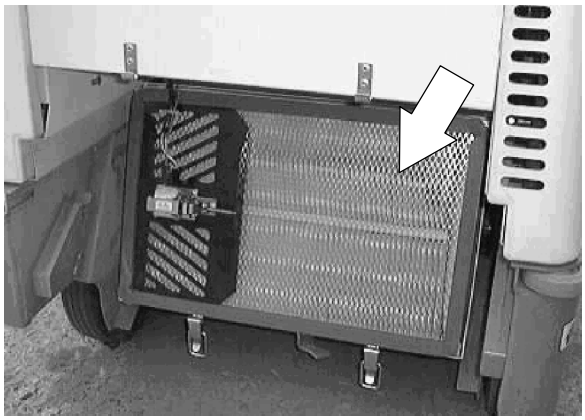
1. Remove the debris hopper from the machine.



2. Un-latch the two filter pivot latches at the rear of the machine.



3. Let the hooper filter pivot down.

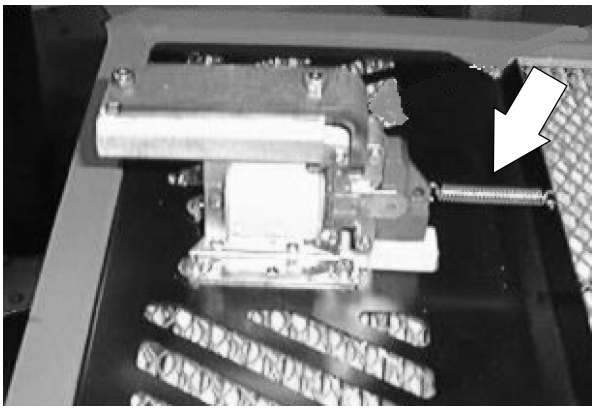


4. Disconnect the wires leading to the filter shaker.

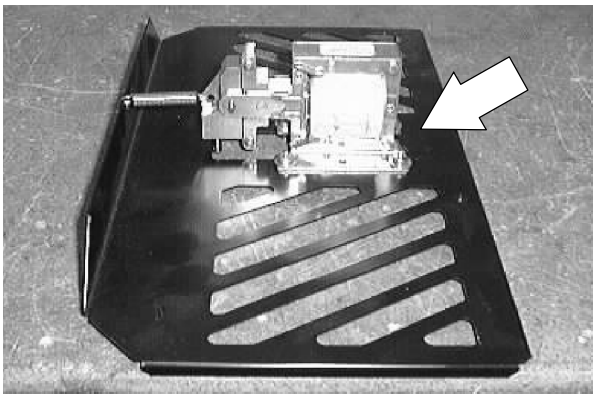
NOTE: Apply pressure between the shaker solenoid terminals when removing the wires.

5. Remove the filter from the filter tray.

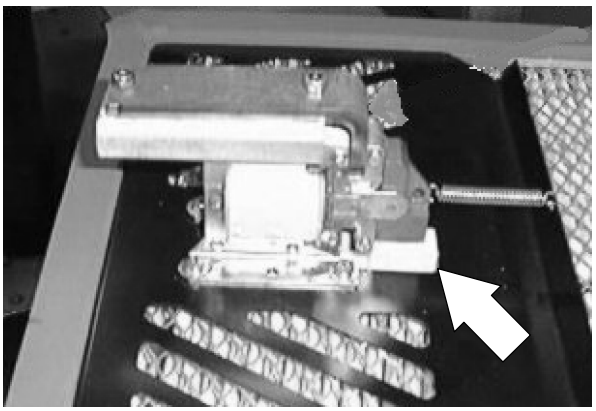
6. Pull back on the tension spring located on the shaker assembly. Cut the plastic ties holding the shaker to the filter.



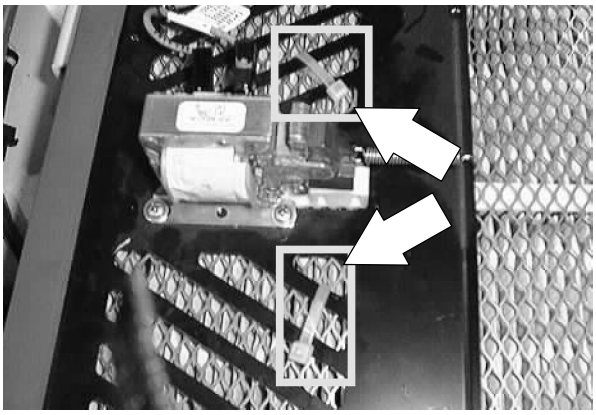
7. Remove the filter shaker assembly from the filter.



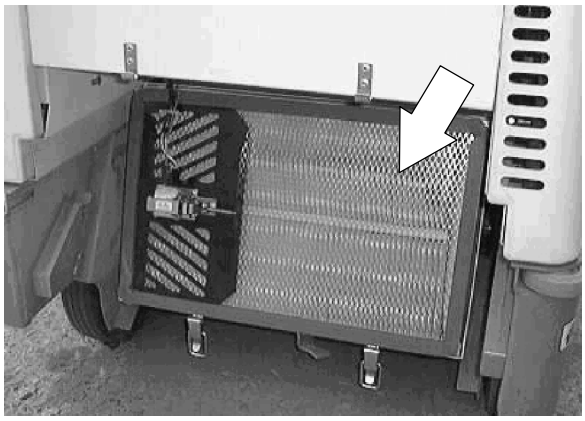
8. Install the filter shaker assembly onto the new filter. Make sure the pin on the shaker assembly is inserted in the hole in the filter shaker comb.



9. Make sure the filter shaker assembly is installed properly, the edge of the shaker should be between the filter and the filter seal.

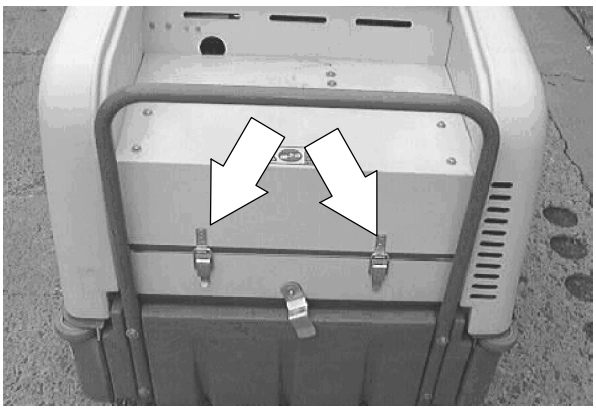


10. Reinstall the filter assembly into the filter tray.



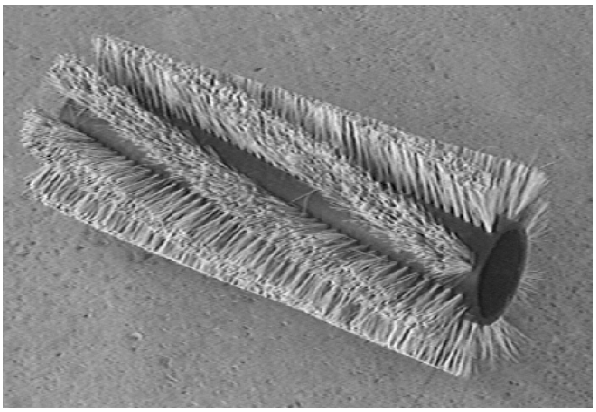
11. Reconnect the wires to the filter shaker.

12. Pivot the filter tray up and re-latch the latches.



13. Reinstall the debris hopper and lock the retainer bracket.

MAIN BRUSH



The main brush is cylindrical and spans the width of the machine, sweeping debris into the hopper.

Check the brush daily for wear or damage. Remove any string or wire tangled on the main brush, main brush drive hub, or main brush idler hub.

Check the main brush pattern weekly. The pattern should be 50 to 75 mm (2 to 3 in) wide with the main brush in the lowered position.

Rotate the main brush end-for-end after every 50 hours of operation for maximum brush life and best sweeping performance.

Replace the main brush when the remaining bristles measure 25 mm (1 in) in length.

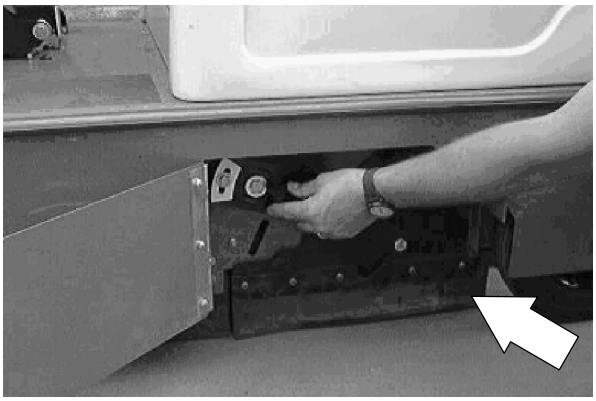
TO REPLACE MAIN BRUSH

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake.

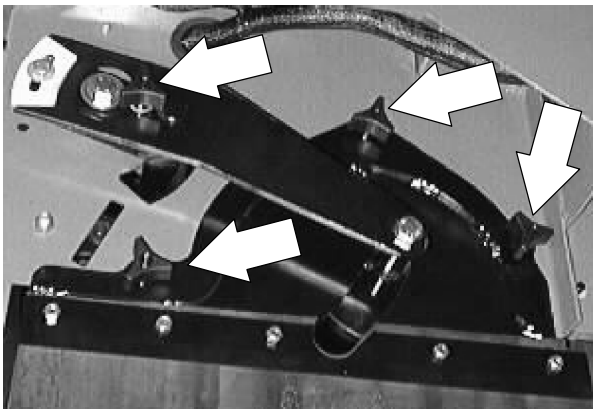
1. Stop the machine, set the parking brake and turn the machine power off.

FOR SAFETY: Before leaving or servicing machine, stop on level surface, set parking brake, turn off machine, and remove key.

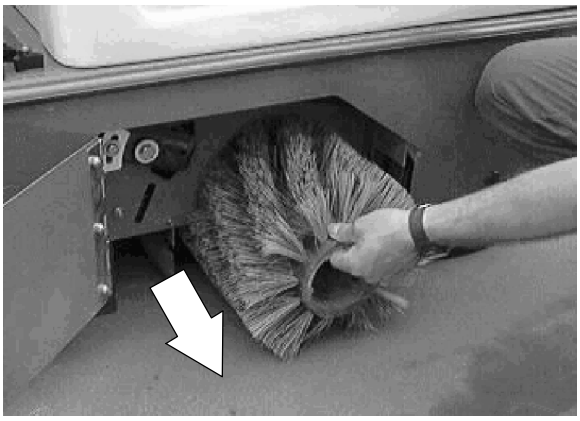
2. Open the left side main brush access door.



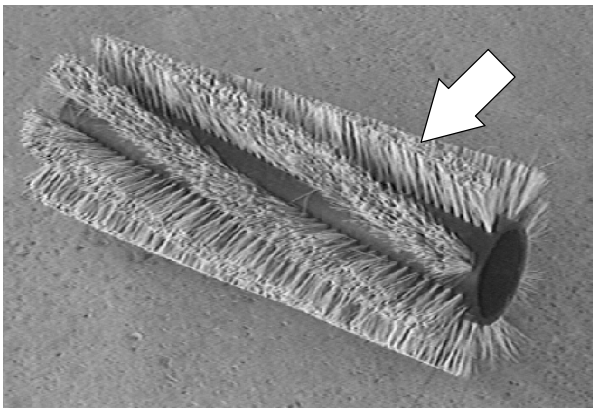
3. Loosen the idler arm mounting knob and three other side skirt mounting knobs. Remove the brush idler arm assembly.



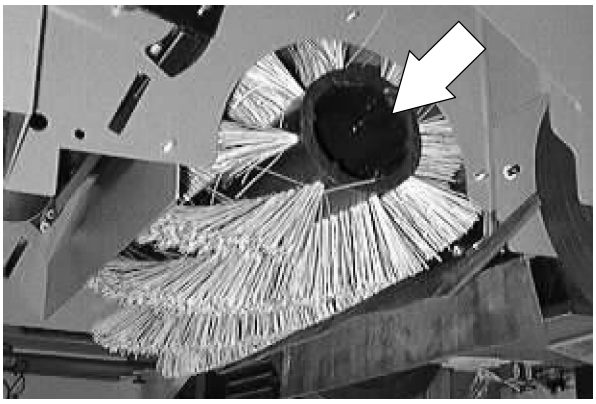
4. Grasp the main brush; pull it off the brush drive plug and out of the main brush compartment.



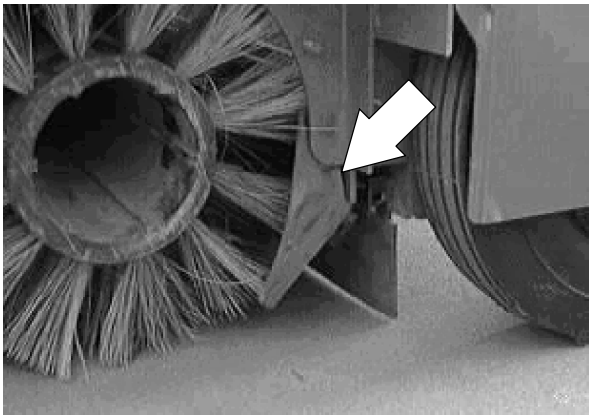
5. Put the new or rotated end-for-end main brush on the floor next to the access door.



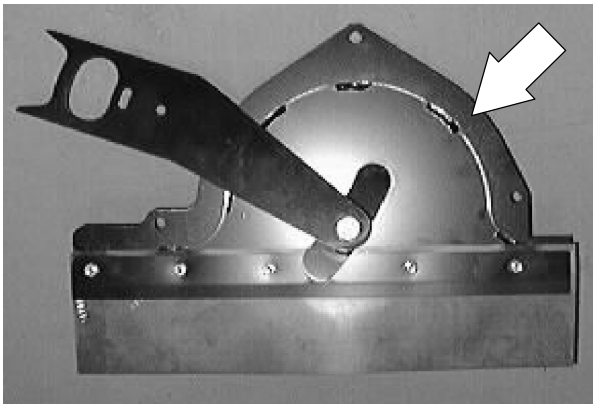
6. Slide the main brush onto the drive plug. Rotate the brush until it engages the drive plug, and push it all the way onto the plug.



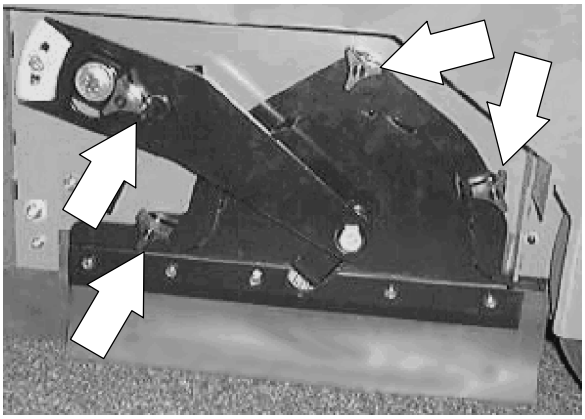
7. Check that the recirculation skirt is tucked in behind the frame.



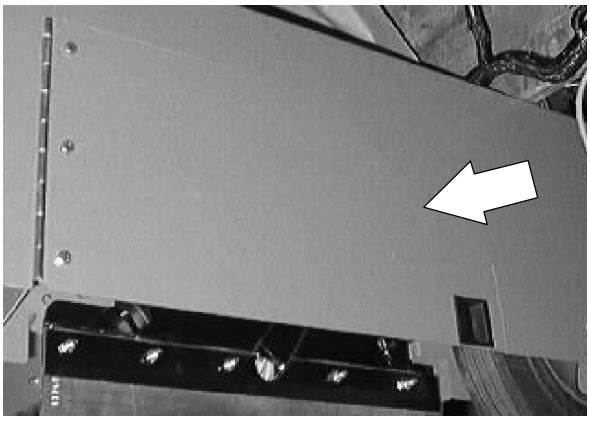
8. Slide the main brush idler arm plug onto the main brush.



9. Secure the idler arm on the bolts. Hand tighten the mounting knobs.



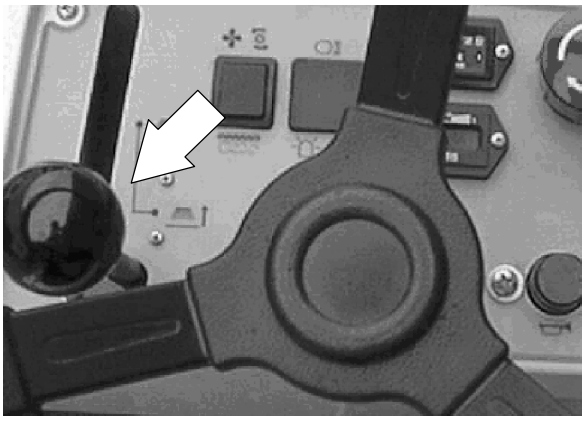
10. Close the main brush access door.



CHECKING AND ADJUSTING MAIN BRUSH PATTERN

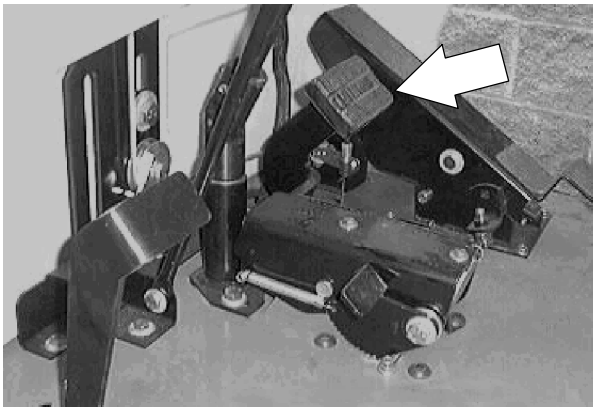
1. Apply chalk, or some other material that will not blow away easily, to a smooth, level floor.

2. Raise the side brush and main brush and position the main brush over the chalked area.



3. Start and lower the main brush for 15 to 20 seconds while keeping a foot on the brakes to keep the machine from moving.

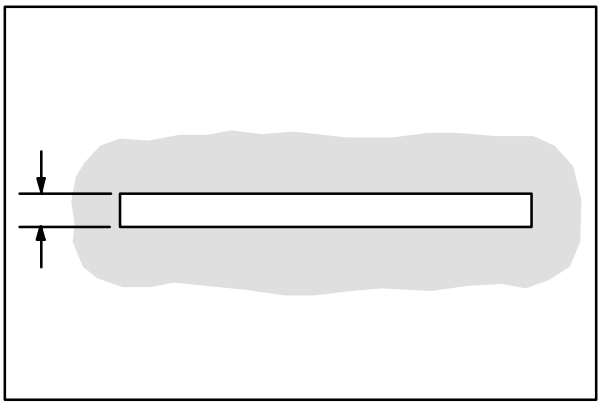
NOTE: If chalk or other material is not available, allow the brushes to spin on the floor for two minutes. A polish mark will remain on the floor.



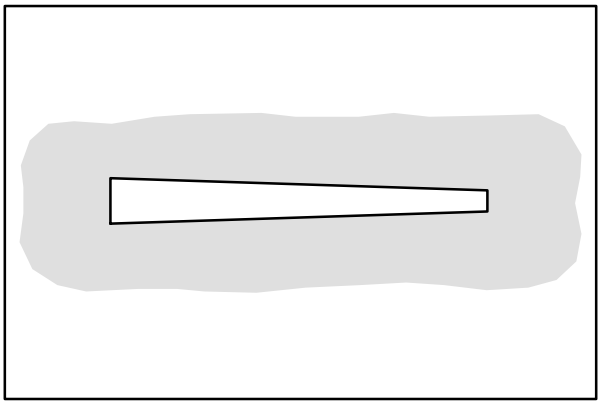
4. Raise the main brush.

5. Drive the machine off the test area.

6. Observe the width of the brush pattern. The proper brush pattern width is 50 to 75 mm (2 to 3 in).



The brush taper is factory set and should not need adjustment unless parts of the brush system have been replaced.



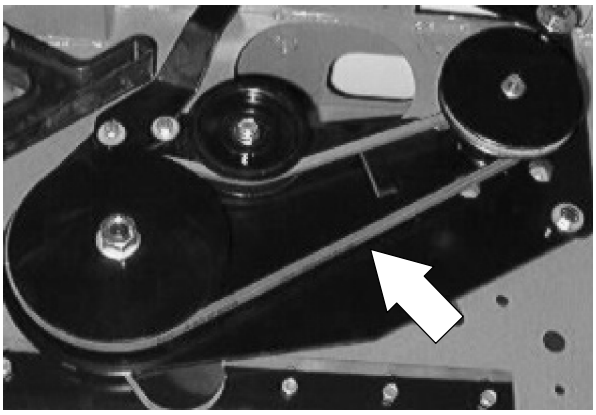
If the main brush pattern is tapered, more than 15 mm (0.5 in) on one end than the other, adjust the taper as follows:

1. Loosen the brush shaft bearing bracket mounting bolt and the idler arm securing head.

2. Allow the brush to operate and float into position for approximately 30 seconds.
3. Tighten the adjustment bolt and idler arm securing knob.
4. Check the main brush pattern and readjust as necessary.

MAIN BRUSH BELTS

Check the main brush belts for wear after every 200 hours of operation. The idlers keep tension on the belts. The tension is set manually.

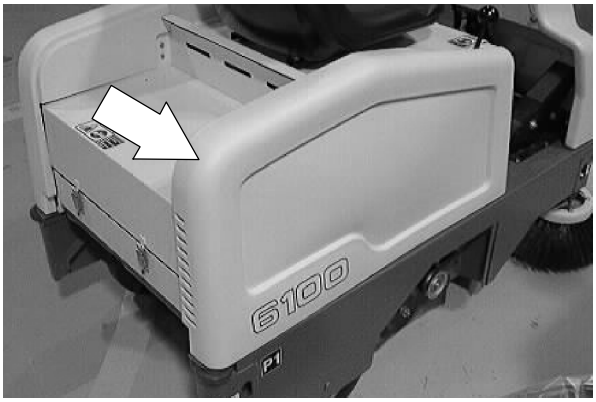


WARNING: Moving belt. Keep away.

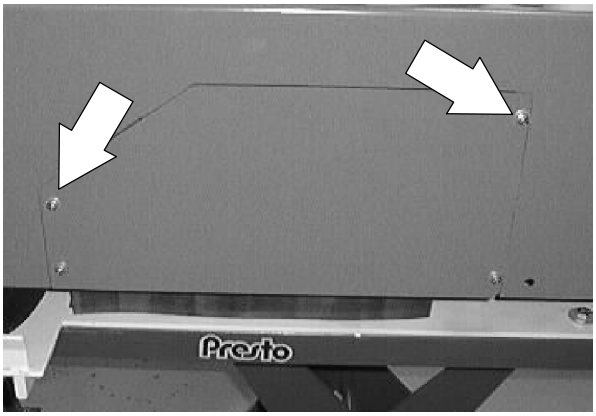
TO REPLACE MAIN BRUSH DRIVE BELT

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake.

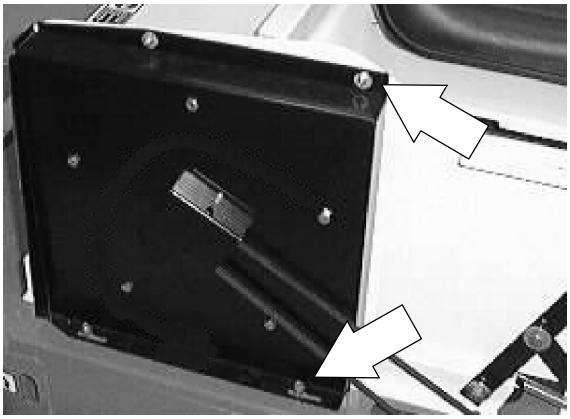
1. Remove the right hand machine panel.



2. Remove the four screws holding the right hand brush door to the machine frame. Remove the right hand side brush door.

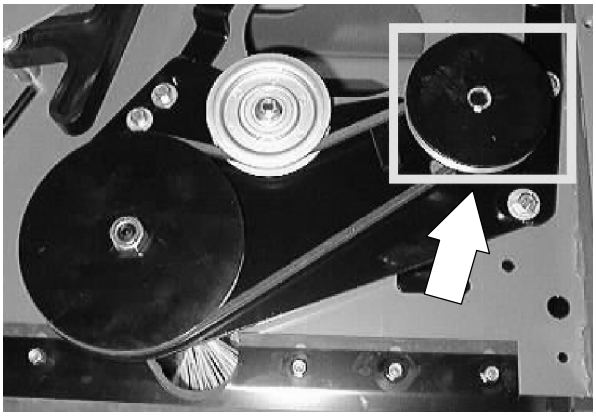


3. Go to the right, rear corner of the machine. Loosen the four hex screws holding the vacuum fan housing to the machine frame.

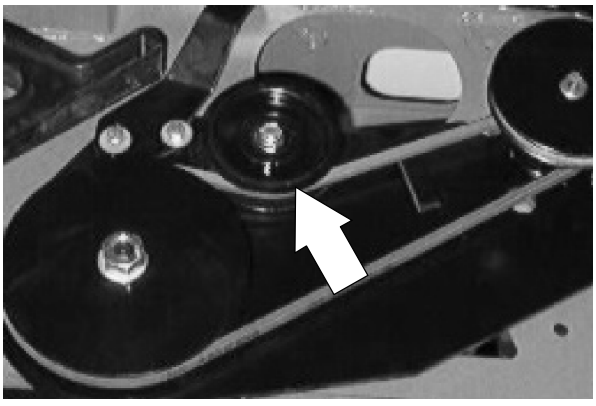


4. Push the vacuum fan assembly forward in the slots to loosen the vacuum fan V-belt.

5. Remove the vacuum fan V-belt from the two groove jackshaft sheave.

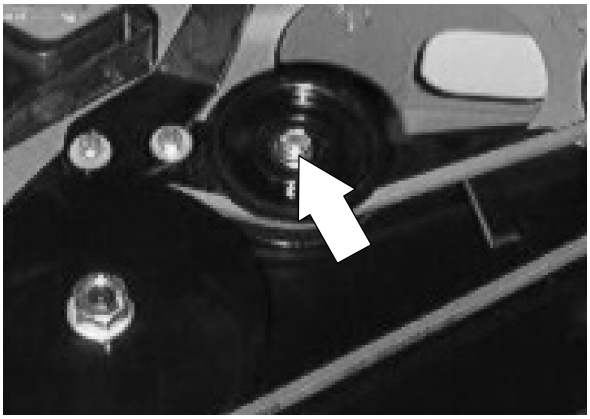


6. Locate the main brush drive belt idler pulley between the jackshaft drive pulley and the larger brush pulley.



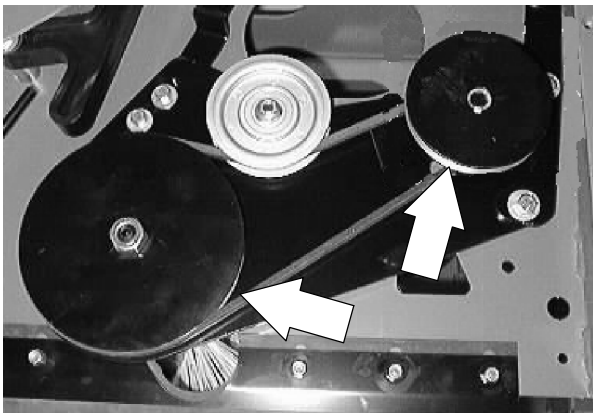
7. Loosen the hex nut in the center of the idler pulley.

8. Push the idler pulley back in the slot.

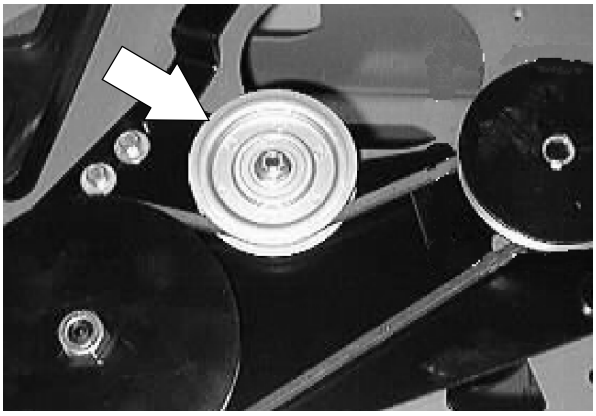


9. Remove the main brush drive belt from the two remaining pulleys. Remove and discard the old V-belt belt.

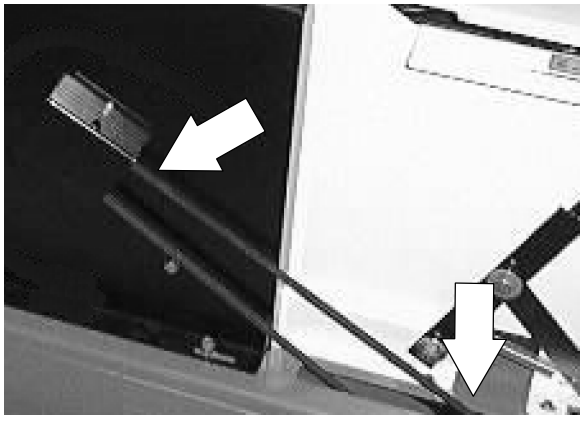
10. Position the new main brush drive belt onto the jackshaft and brush drive pulleys.



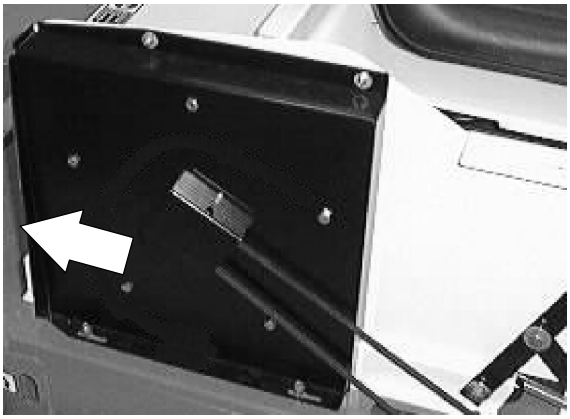
11. Move the idler pulley forward in the slot until the belt is tight. Tighten the hex nut to 18 - 24 Nm (15 - 20 ft lb).



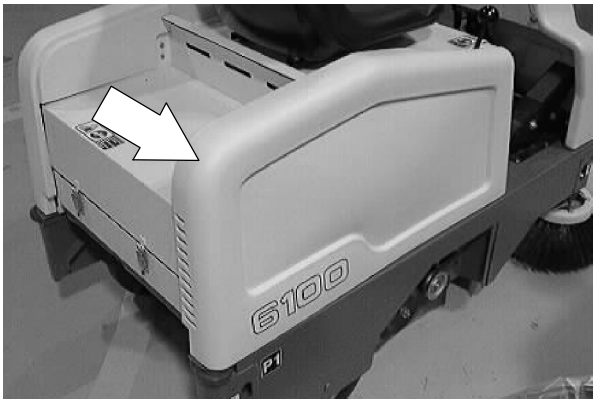
12. Install the vacuum fan V-belt over both pulleys.



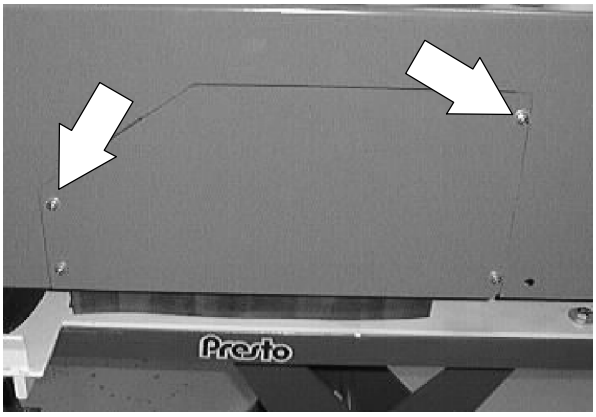
13. Pull the vacuum fan assembly toward the back of the machine to tighten the V-belt. The correct tension is when the belt deflects 8.38 mm (0.33 in) from a force of .42 kg (.90 to .95 lb) at belt midpoint. Tighten the screws hand tight.



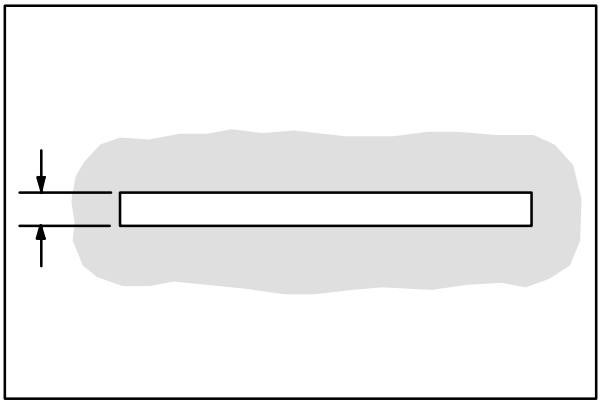
14. Reinstall the right hand machine cover.



15. Reinstall the right hand side brush door.



16. Operate the machine and check the main brush for proper operation.

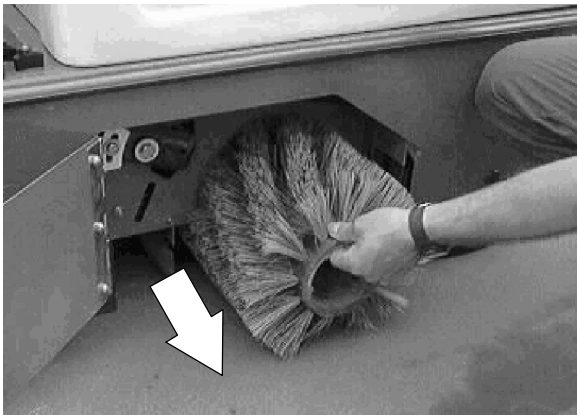


TO REPLACE MAIN BRUSH JACKSHAFT BELT

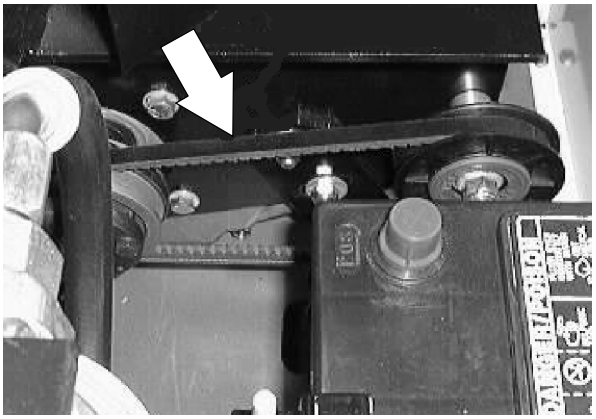
FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake.

1. Open the seat support and engage the prop rod.

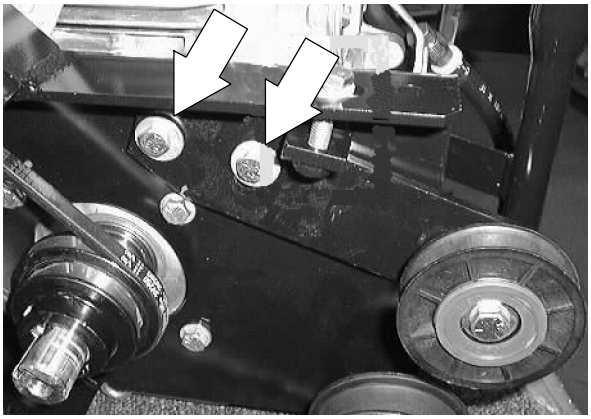
2. Remove the main brush. See TO REPLACE MAIN BRUSH instructions in this section.



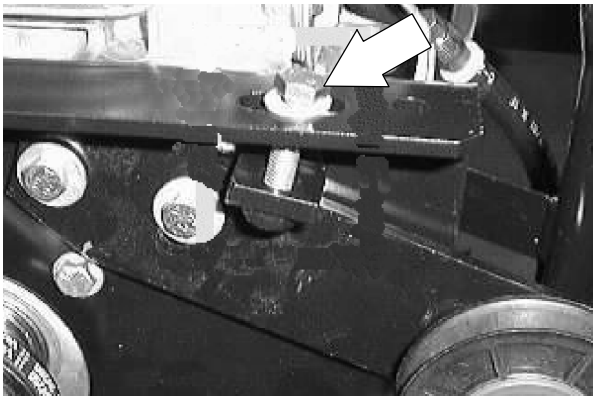
3. Locate the main brush jackshaft belt tension idler pulley mount plate beside the machine battery.



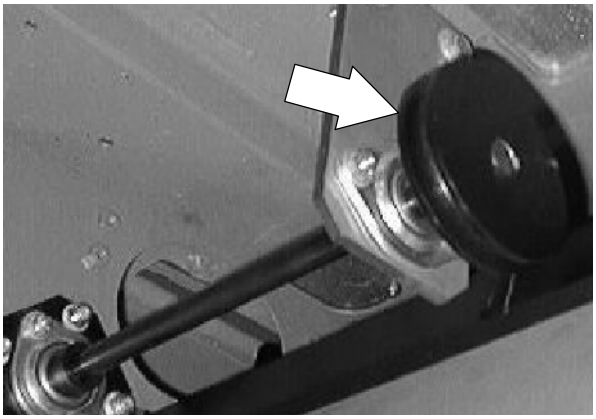
4. Loosen the nuts holding the idler mount plate to the main engine pulley plate.



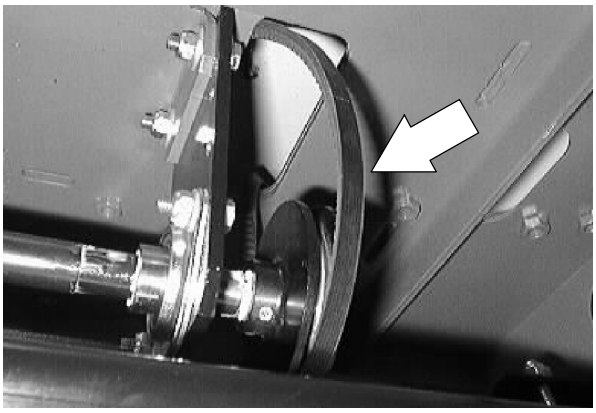
5. Use the V-belt tension bolt to lower the idler pulley mount plate down. This will loosen the tension on the jack shaft center V-belt.



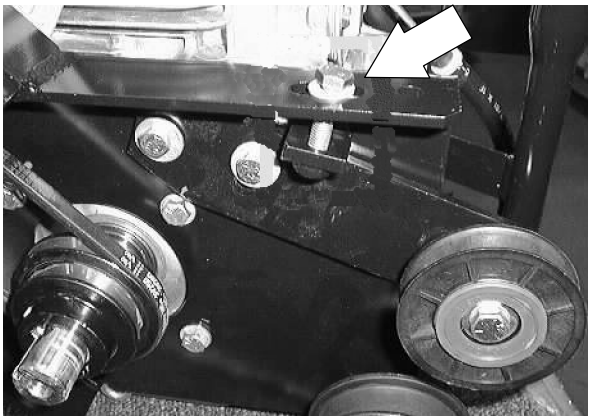
6. Remove the V-belt from the engine sheave, idler sheaves, and main jack shaft sheave. Remove the V-belt from the machine.



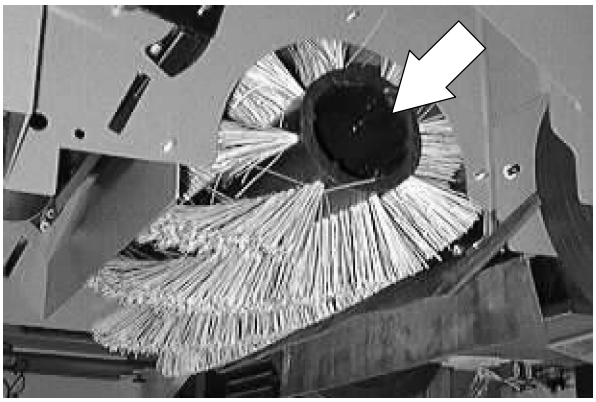
7. Install the new V-belt onto the engine sheave, idler sheaves, and jack shaft sheave.



8. Use the V-belt tension bolt to pull the tension idler pulley mount plate up until the new V-belt is tight. Tighten the two nuts to 18 - 24 Nm (15 - 20 ft lb).



9. Reinstall the main brush. See TO REPLACE MAIN BRUSH instructions in this section.

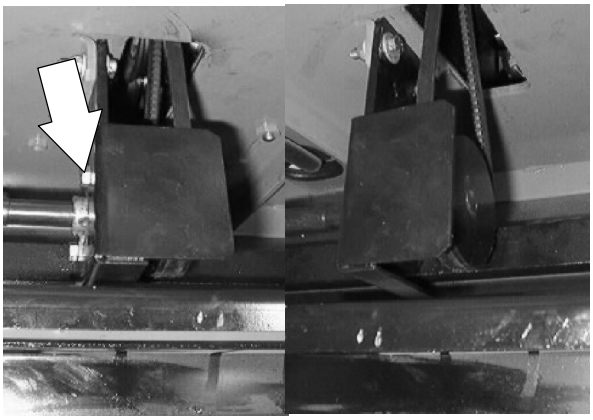


10. Disengage the seat rod and close the seat assembly.

11. Operate the machine and check the main brush for proper operation.

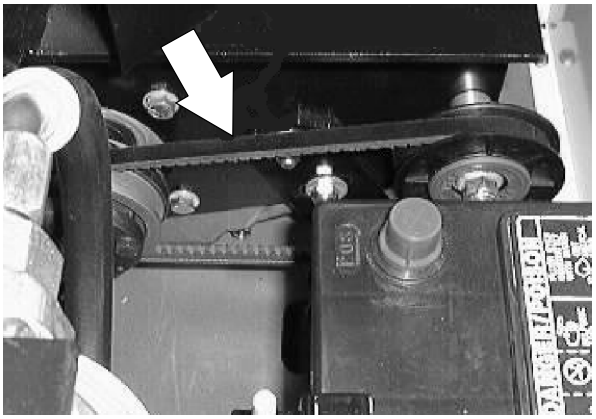
TO REPLACE MAIN BRUSH JACKSHAFT INNER BEARING

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake.



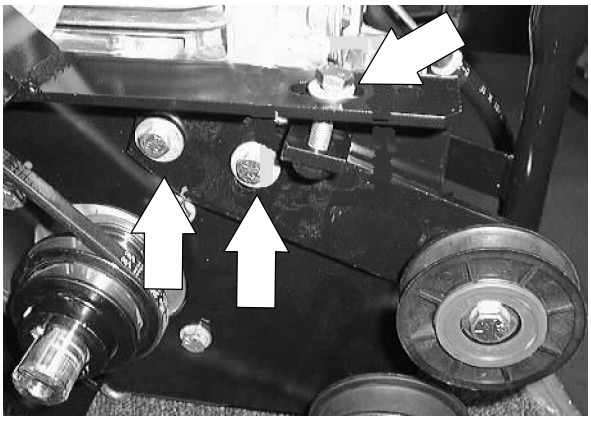
1. Open the seat support and engage the prop rod.

2. Locate the main brush jackshaft belt tension idler pulley mount plate beside the machine battery.

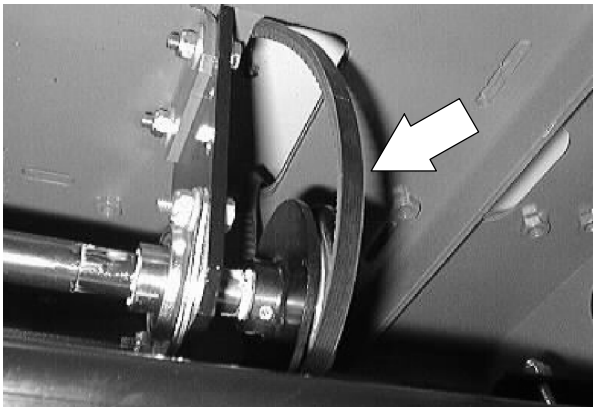


3. Loosen the nuts holding the jackshaft belt idler mount plate to the main engine pulley plate.

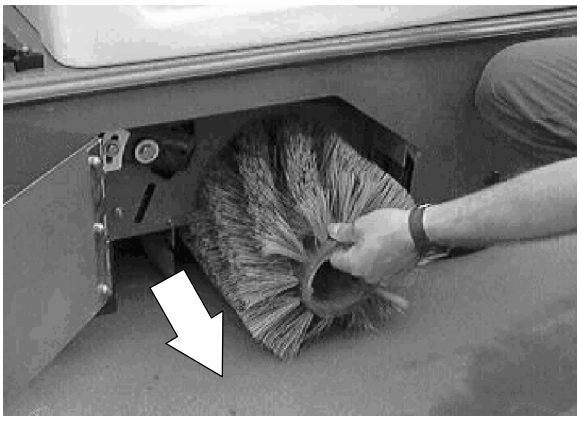
4. Use the V-belt tension bolt to lower the idler pulley mount plate down. This will loosen the tension on the jack shaft center V-belt.



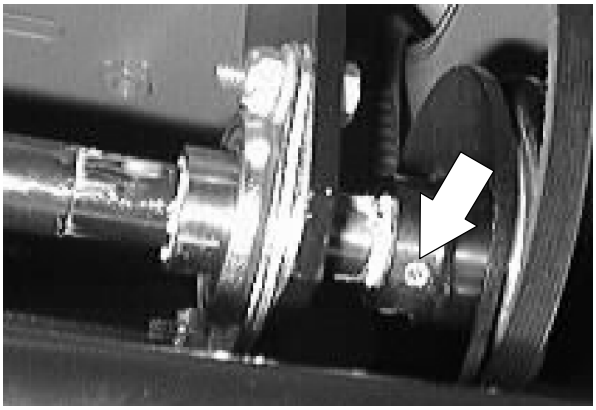
5. Remove the V-belt from the engine sheave, idler sheaves, and main brush jackshaft sheave.



6. Open the left hand brush door and remove the main brush. See TO REPLACE MAIN BRUSH instructions in this section.

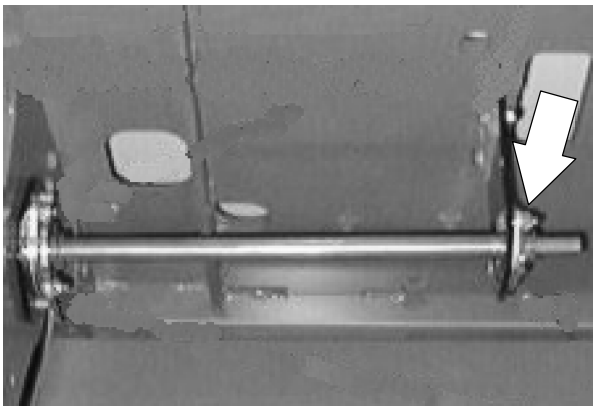


7. Locate the main brush jackshaft V-belt sheave in the brush compartment area. Loosen the two set screws. Remove the sheave from the jackshaft. Retain the square key.

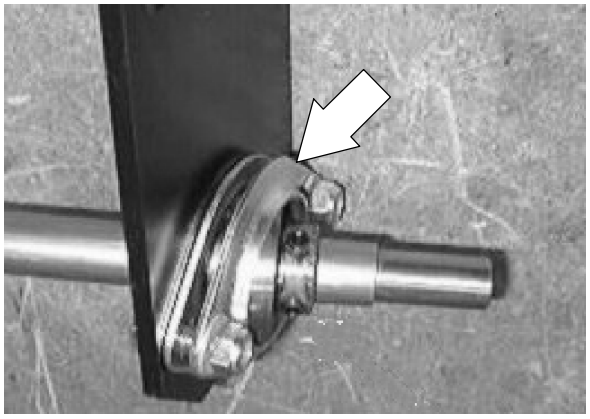


8. Loosen the set screws on the bearing lock collar. Use a hammer and punch to knock the collar loose from the bearing race.

9. Remove the two hex screws and nuts holding the bearing flanges to the mount bracket.

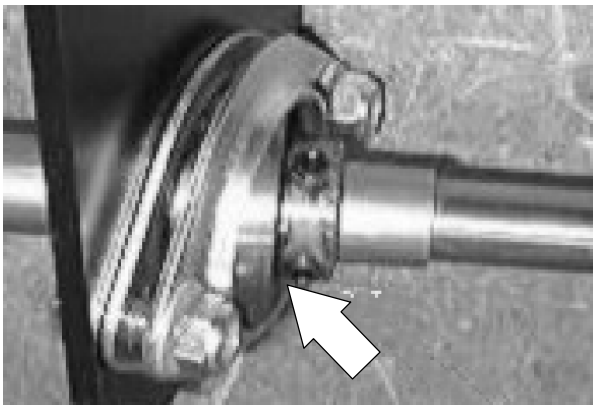


10. Remove the outer bearing flange from the mount bracket.

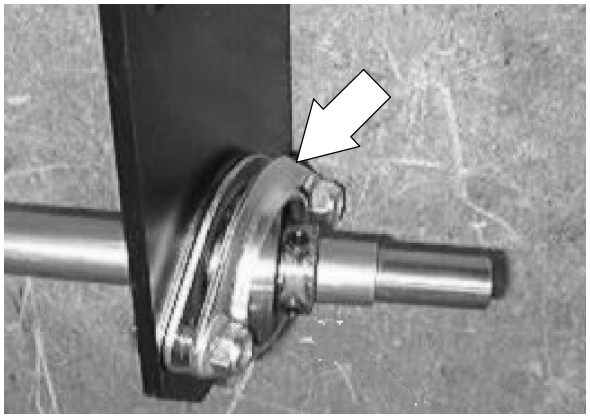


11. Pull the inner bearing off the jackshaft.

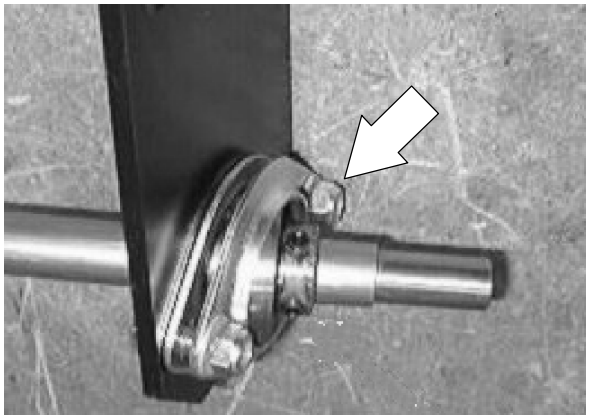
12. Install the new bearing onto the main brush jackshaft. Make sure the lock collar is installed on the shaft first.



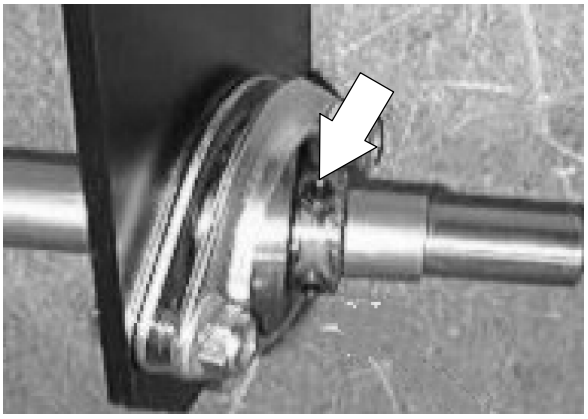
13. Position the outer bearing flange onto the mount bracket. Reinstall the hardware. Leave loose for now.



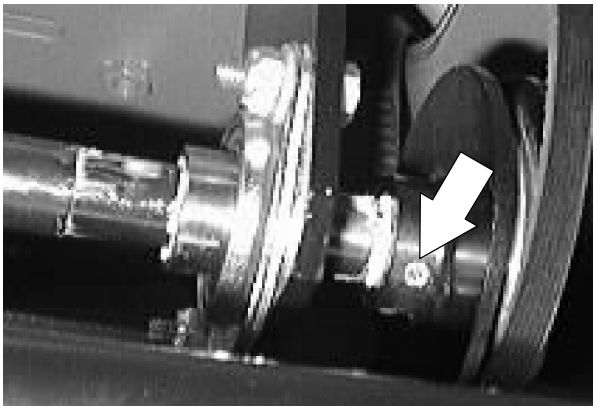
14. Push the bearing in until it is seated against the inner flange. Tighten the hardware to 18 – 24 Nm (15 – 20 ft lb).



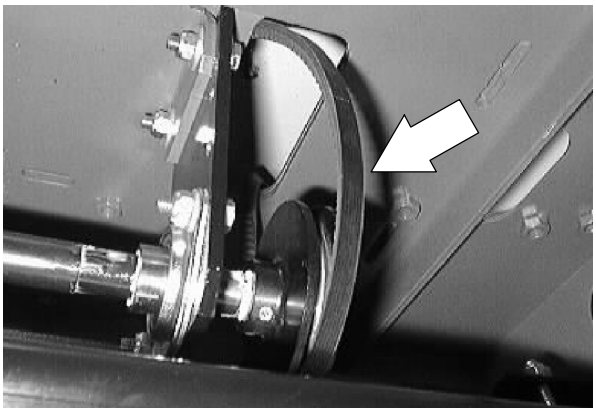
15. Use a hammer and punch to tighten the bearing lock collar onto the bearing race. Hand tighten the collar set screw tight.



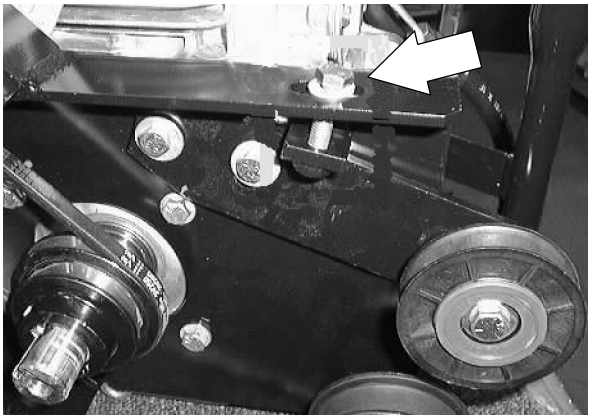
16. Reinstall the sheave onto the end of the jackshaft. Make sure the square key is in place on the jackshaft. *Position the sheave so the face is flush with the end of the shaft.* Hand tighten the two sheave set screws tight.



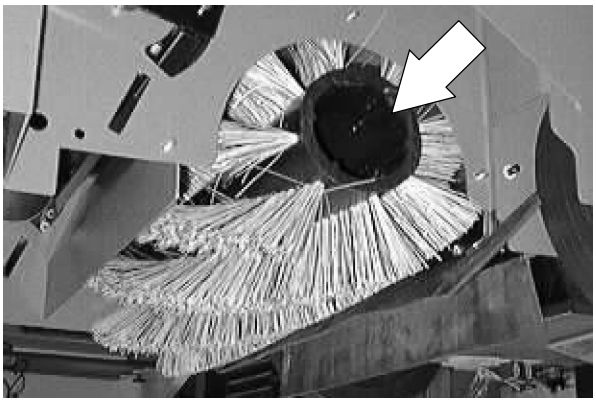
17. Position the V–belt over the jack shaft sheave, idler sheaves, and engine sheave.



18. Use the V-belt tension bolt to pull up on the idler arm to tighten the V-belt. Tighten the two nuts to 18 - 24 Nm (15 - 20 ft lb).



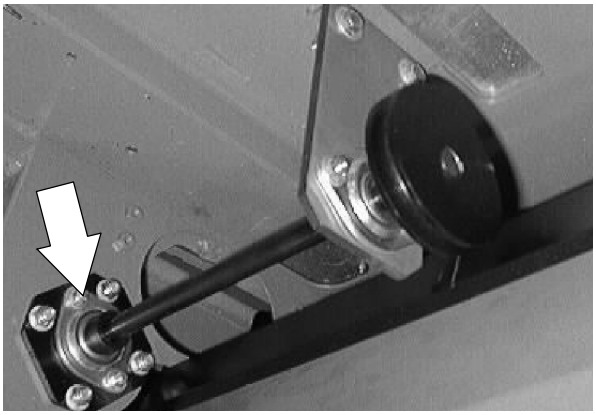
19. Reinstall the main brush. See TO REPLACE MAIN BRUSH instructions in this section.



20. Start the machine and operate the main brush. Check for proper operation.

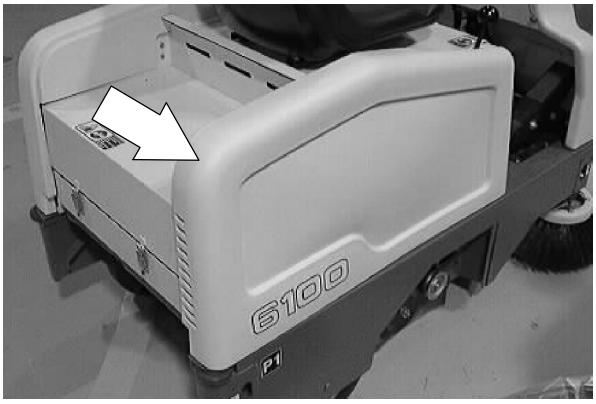
TO REPLACE MAIN BRUSH JACKSHAFT OUTER BEARING

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake.

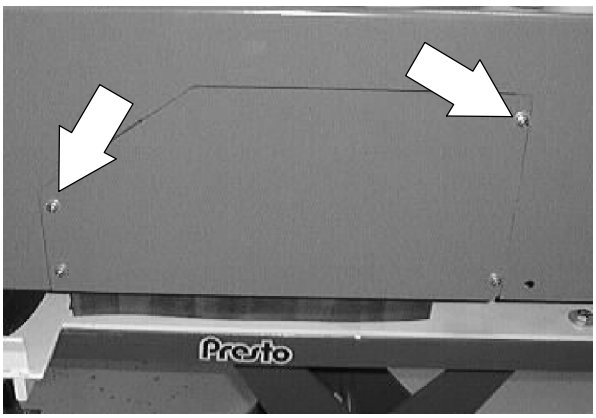


1. Open the seat support and engage the prop rod.

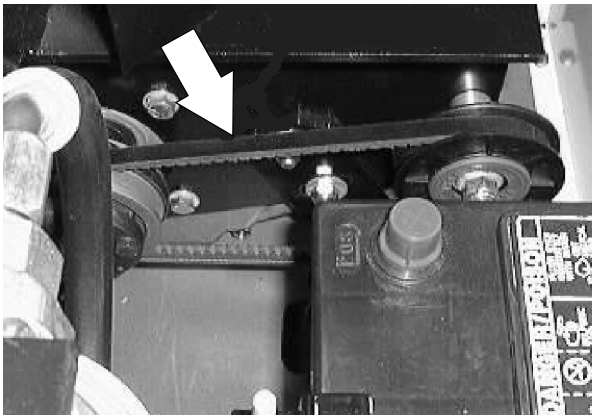
2. Remove the right hand machine panel.



3. Remove the right hand brush door.

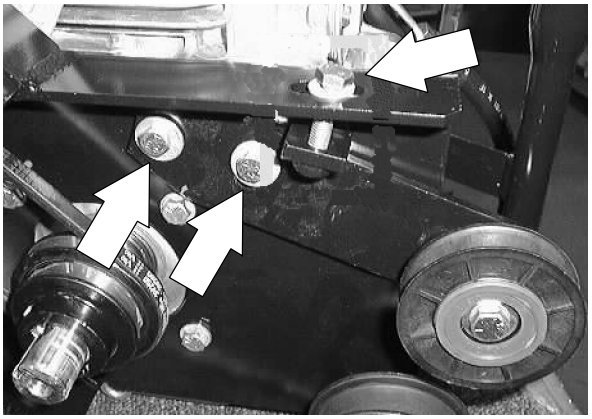


4. Locate the main brush jackshaft belt on the engine mounted sheave plate.

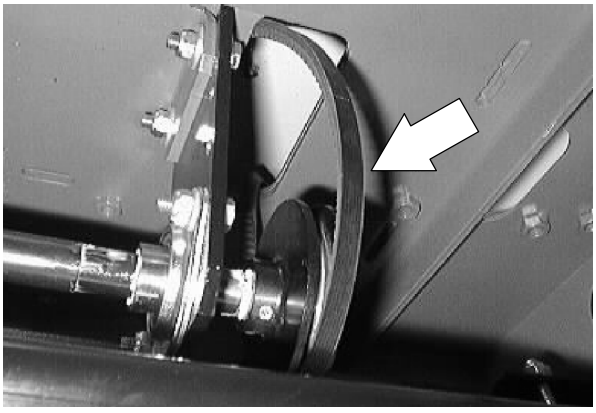


5. Loosen the nuts holding the jackshaft belt idler mount plate to the main engine pulley plate.

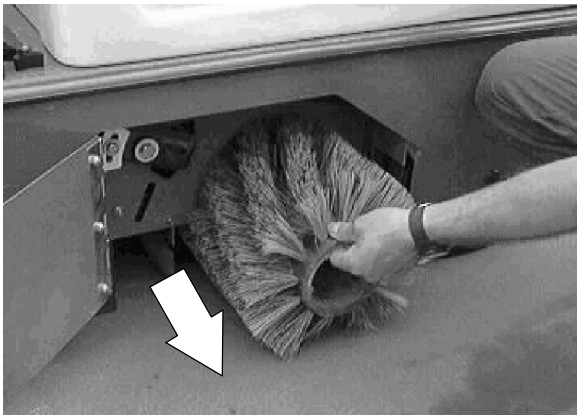
6. Use the V-belt tension bolt to drop the idler pulley mount plate down to loosen the tension on the main brush center V-belt.



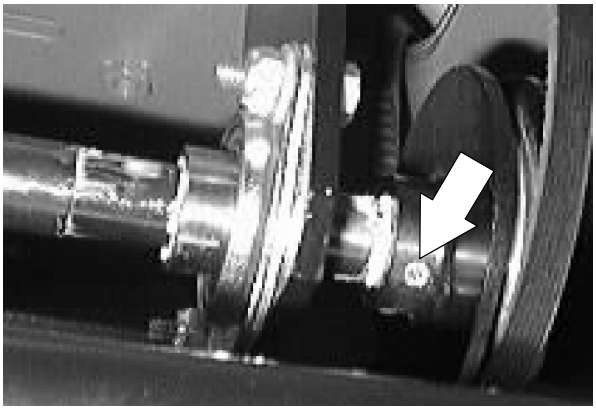
7. Remove the V-belt from the engine sheave, idler sheaves, and main brush jackshaft sheave.



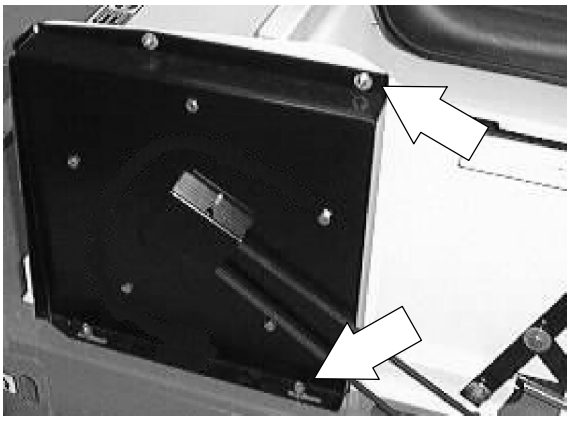
8. Open the left hand brush door and remove the main brush. See TO REPLACE MAIN BRUSH instructions in this section.



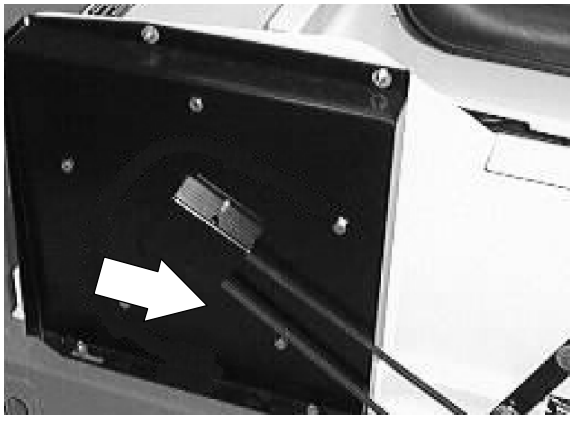
9. Loosen the one set screw on each of the jackshaft bearing locking collars. Use a hammer and punch to knock the collars loose from the bearing races.



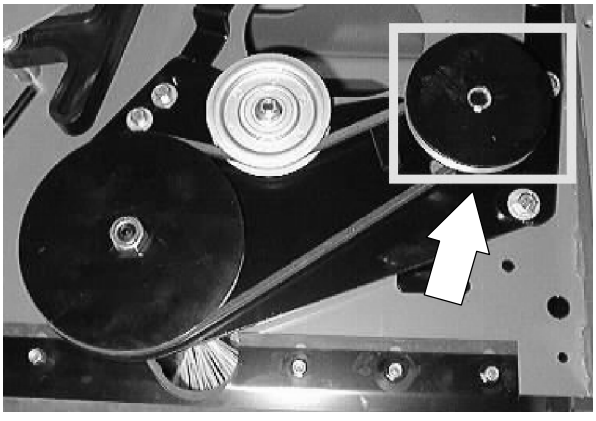
10. Go to the right, rear corner of the machine and loosen the four hex screws holding the vacuum fan housing to the machine frame.



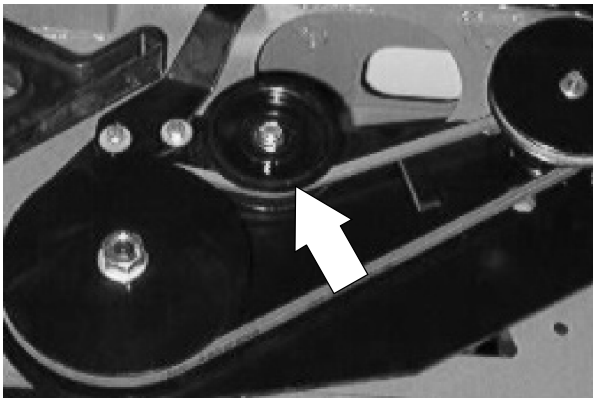
11. Push the vacuum fan assembly forward in the slots to loosen the vacuum fan V-belt.



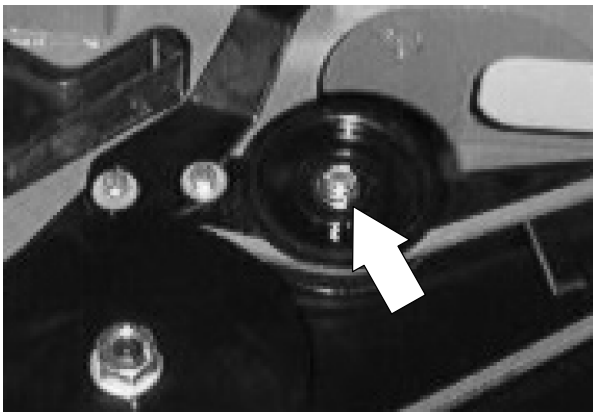
12. Remove the vacuum fan V-belt from the two groove jackshaft sheave.



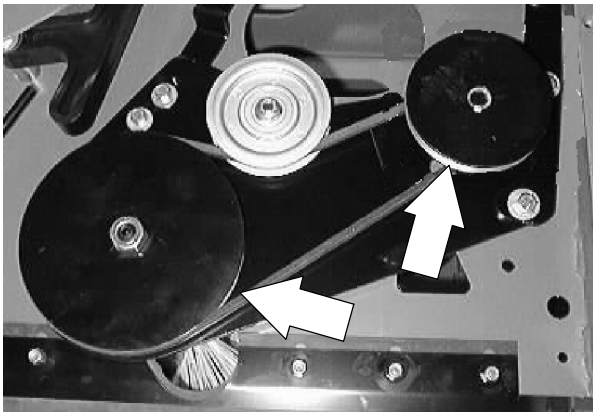
13. Locate the main brush drive belt idler pulley between the jackshaft drive pulley and the larger brush pulley.



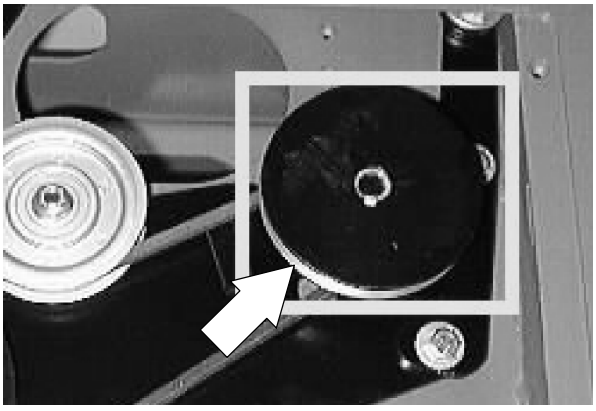
14. Loosen the hex nut in the center of the idler pulley.



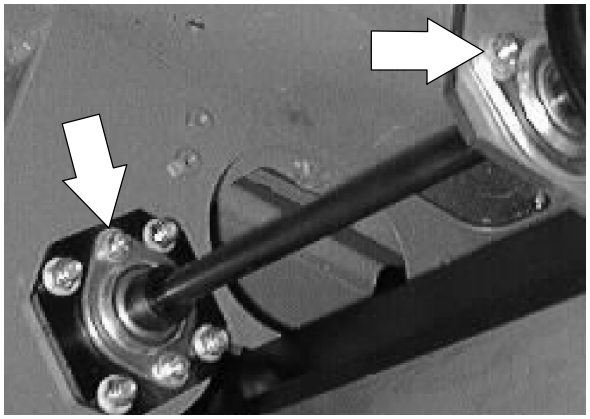
15. Push the idler pulley back in the slot. Remove the main brush V-belt from the jackshaft sheave.



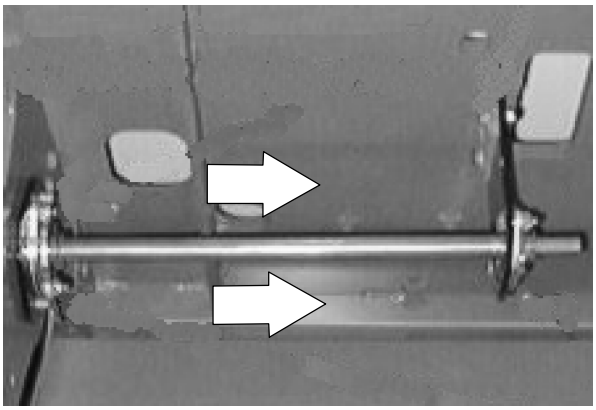
16. Loosen the two set screws holding the 2-groove sheave to the outside end of the main brush jackshaft. Pull the sheave off the shaft. Retain the shaft key.



17. Loosen the hardware holding each of the two jackshaft bearing flanges to the mount brackets.



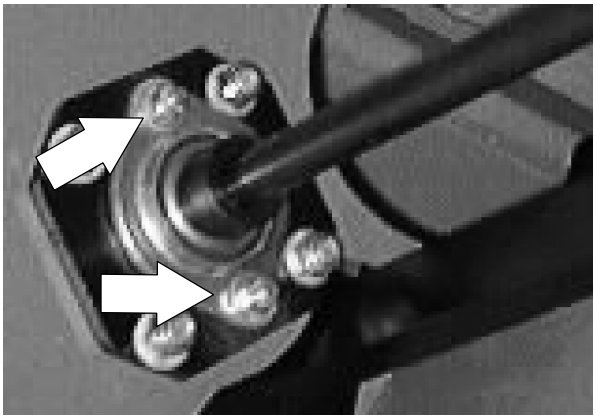
18. Push the jackshaft in, toward the center of the machine. Push the shaft in far enough so it clears the outer bearing.



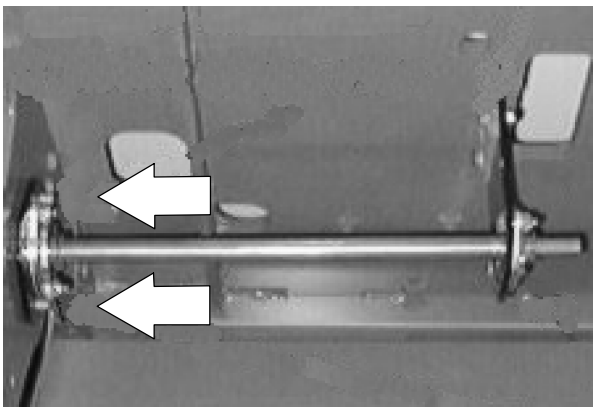
19. Remove the two nuts holding the bearing flanges to the inside wall of the right hand side of the main brush wrap.

20. Remove the outer jackshaft bearing from the machine. Leave the locking collar on the end of the jackshaft.

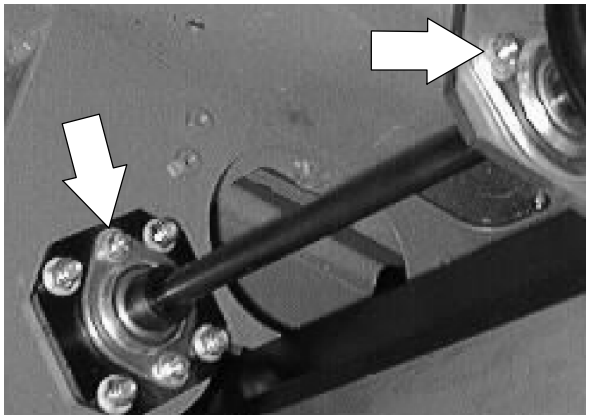
21. Position the new outer bearing and the two bearing flanges onto the mount bracket. Reinstall the two nuts. Leave hardware loose for now. Make sure the bearing locking collar is in place on the jackshaft.



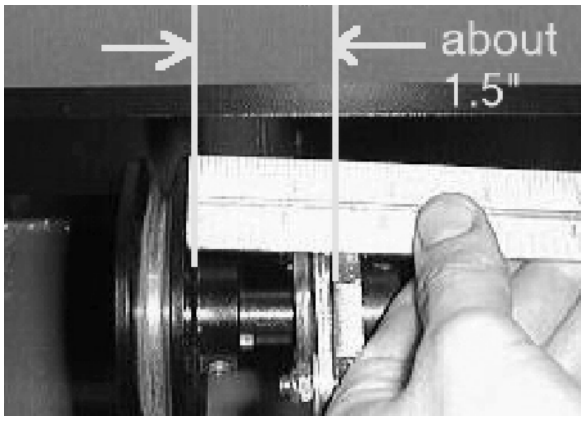
22. Push the jackshaft through the new bearing until the end is showing out the right hand side of the brush wrap.



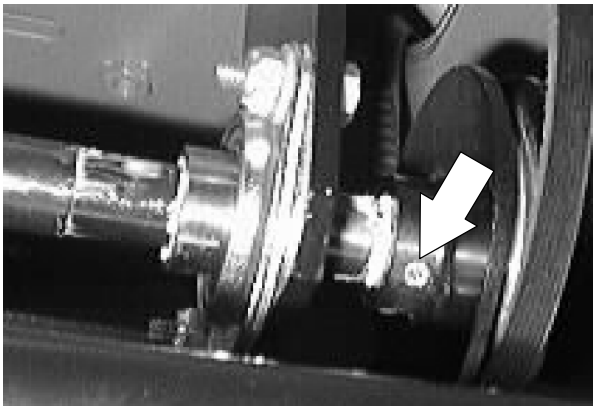
23. Go under the machine in the brush wrap area. Tighten the hardware holding the two jackshaft bearing flanges to the mount brackets. Tighten the hardware to 18 – 24 Nm (15 – 20 ft lb).



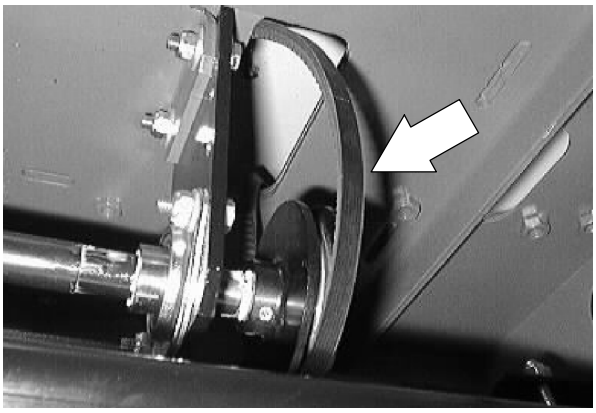
24. Position the jackshaft so the distance between the inside face of the inner sheave and the bearing flange mount bracket is about 1.5 inch.



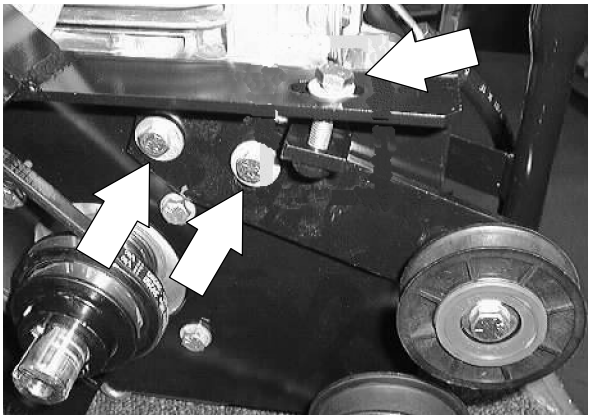
25. Use a hammer and punch to tighten the bearing locking collars onto the bearing race of both jackshaft bearings. Hand tighten the collar set screw tight.



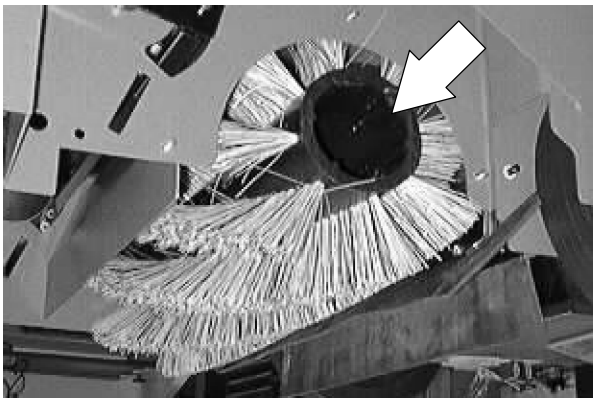
26. Position the V–belt over the jack shaft sheave, idler sheaves, and engine sheave.



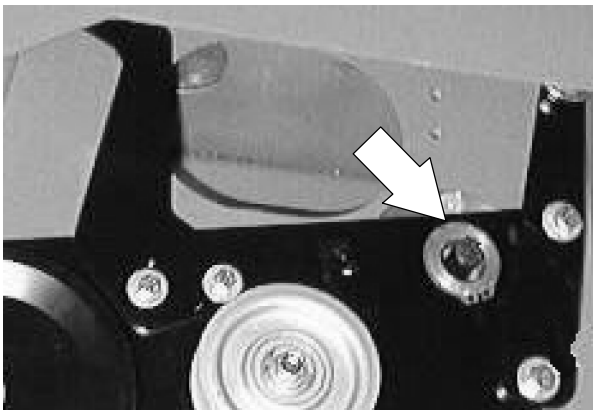
27. Use the V-belt tension bolt to pull up on the idler arm. This will tighten the V-belt. Tighten the two hex screws to 18 - 24 Nm (15 - 20 ft lb).



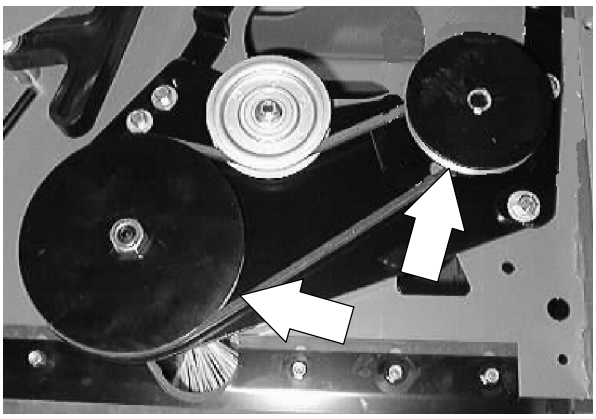
28. Reinstall the main brush. See TO REPLACE MAIN BRUSH instructions in this section.



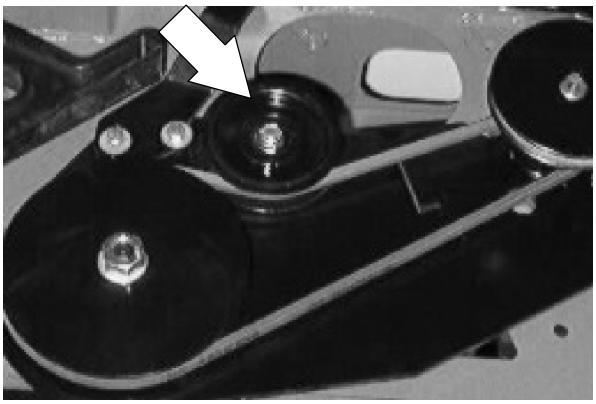
29. Go to the right side of the machine in the main brush area. Reinstall the square key and two groove sheave (small sheave to the inside) onto the outer end of the jackshaft. Hand tighten the two set screws tight.



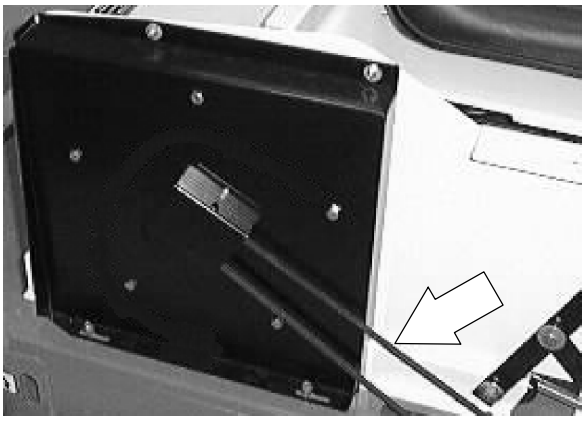
30. Position the main brush drive belt onto the jackshaft and brush drive pulleys.



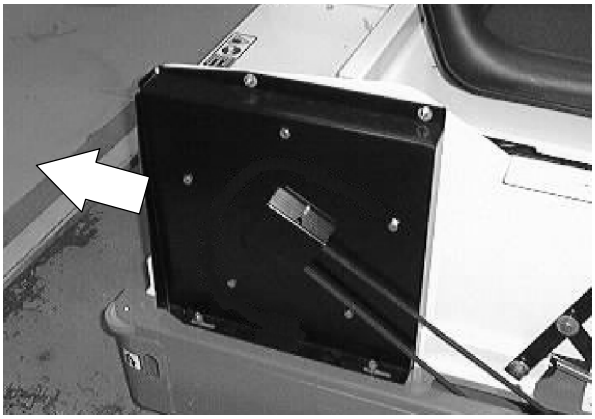
31. Move the idler pulley forward in the slot until the belt is tight. Tighten the hex nut to 18 – 24 Nm (15 – 20 ft lb).



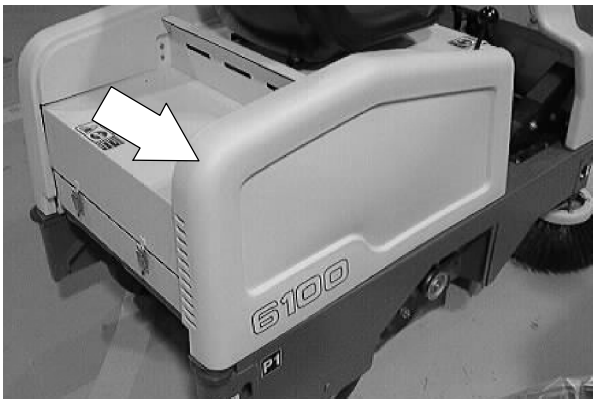
32. Install the vacuum fan V–belt over both pulleys.



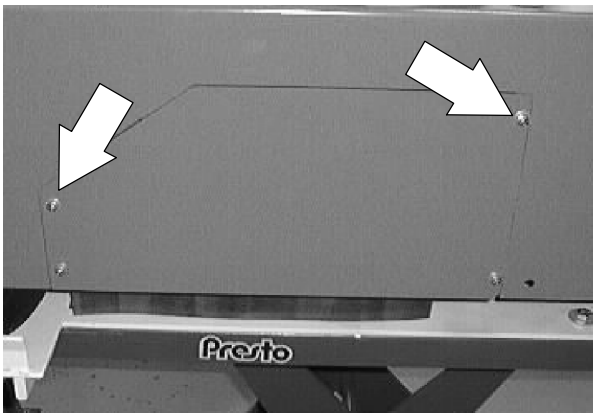
33. Pull the vacuum fan assembly toward the back of the machine to tighten the V–belt. The correct tension is when the belt deflects 8.38 mm (0.33 in) from a force of .42 kg (.90 to .95 lb) at belt midpoint. Tighten the screws hand tight.



34. Reinstall the right hand machine cover.



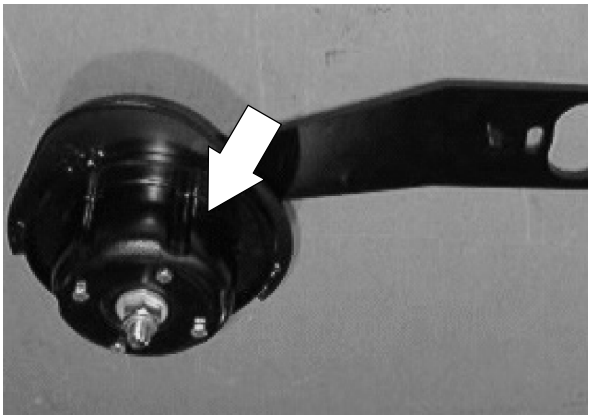
35. Reinstall the right hand side brush door.



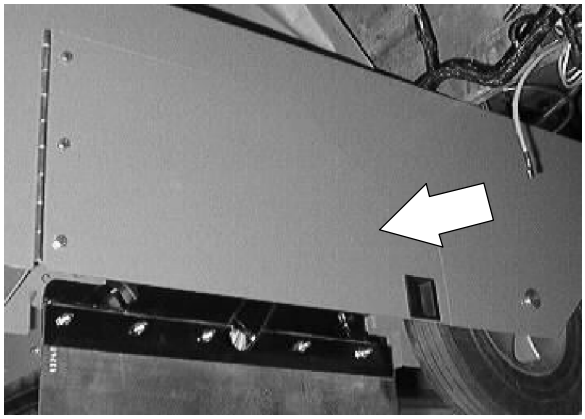
36. Operate the machine and check the main brush for proper operation.

TO REPLACE MAIN BRUSH IDLER PLUG BEARING

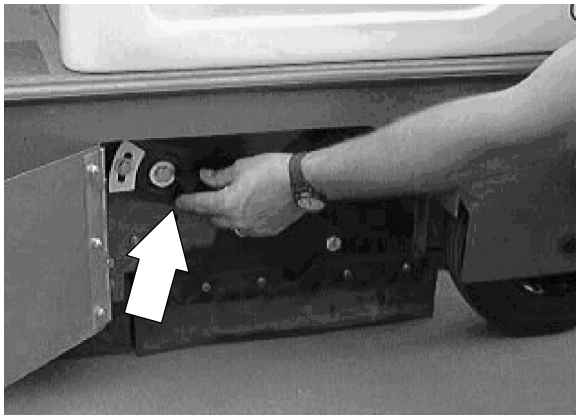
FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake.



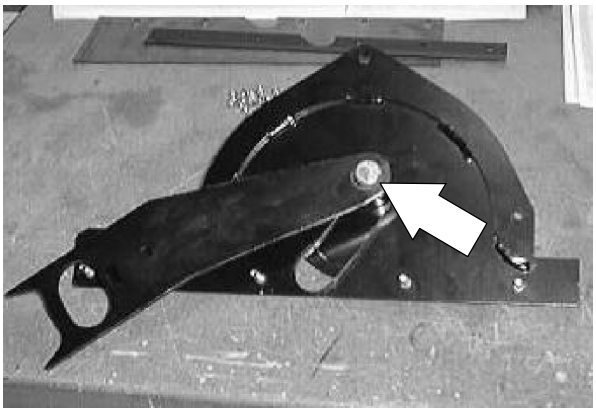
1. Open the left hand side brush door.



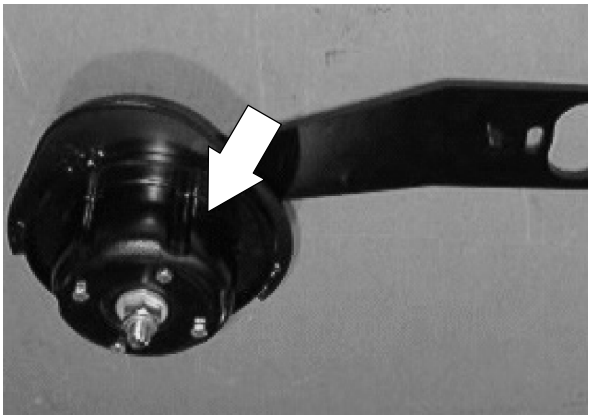
2. Remove the main brush idler mount plate. See TO REPLACE MAIN BRUSH instructions in this sections.



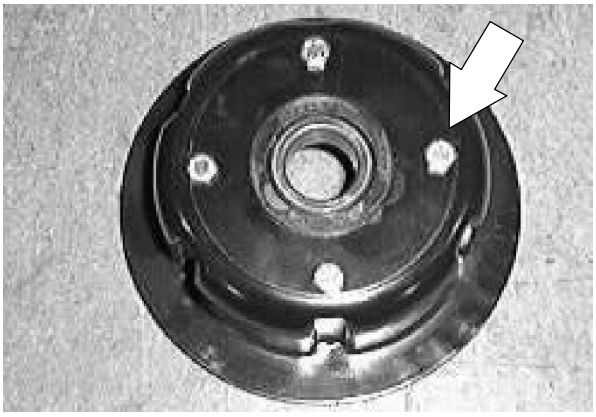
3. Remove the hex screw, nut, and washer holding the idler plug assembly to the brush lift plate.



4. Remove the idler plug assembly from the lift plate.



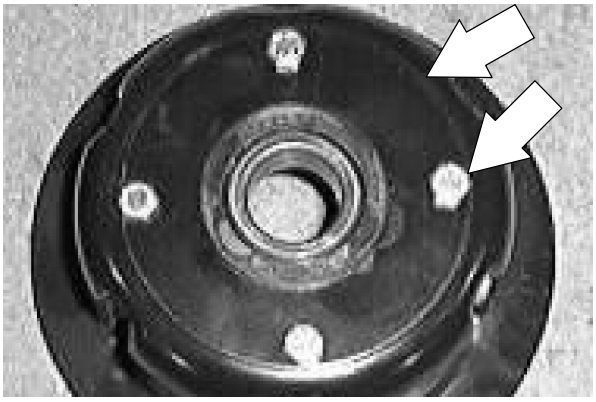
5. Remove the four hex screws holding the bearing retainer to the idler plug. Remove the retainer.



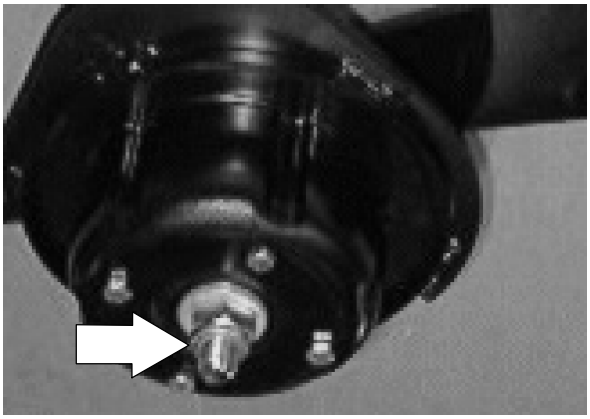
6. Remove and discard the idler ball bearing from the idler plug.

7. Position the new ball bearing into the idler plug.

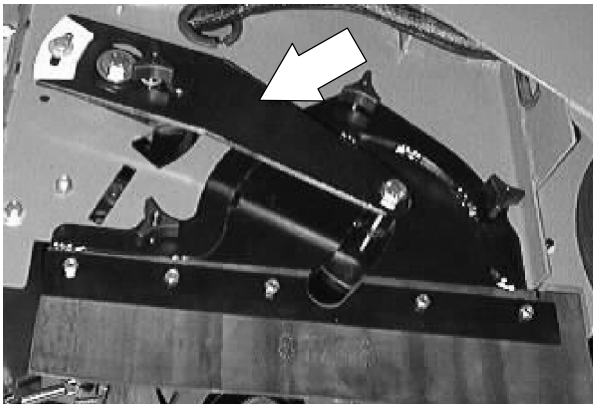
8. Reinstall the bearing retainer plate on the idler plug. Reinstall the four screws and tighten to 8 – 10 Nm (6 – 7 ft lb).



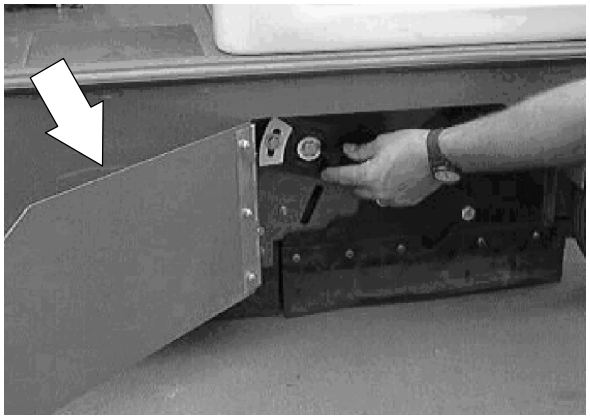
9. Reinstall the idler plug assembly onto the brush lift plate. Reinstall the hex screw, washer, and nyloc nut. Tighten to 37 – 48 Nm (26 – 34 ft lb).



10. Reinstall the main brush idler mount plate. See TO REPLACE MAIN BRUSH instructions in this sections.



11. Close the left hand side brush door.

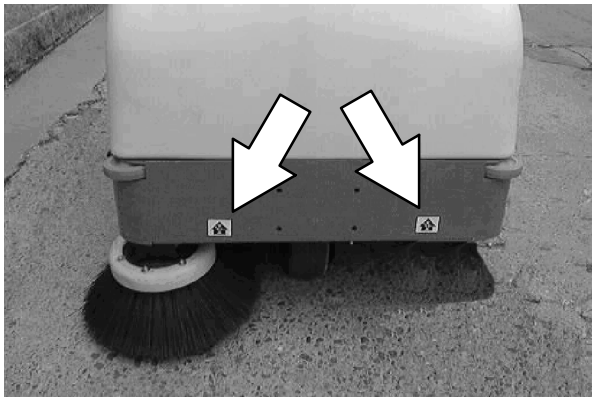


12. Operate the machine and check the main brush for proper operation.

TO REPLACE MAIN BRUSH DRIVE PLUG BEARINGS

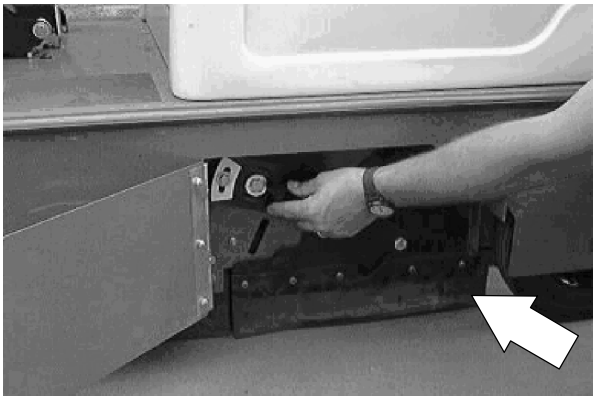
FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake.

1. Jack up the front of the machine at the jack points. Install jack stands under the machine frame.

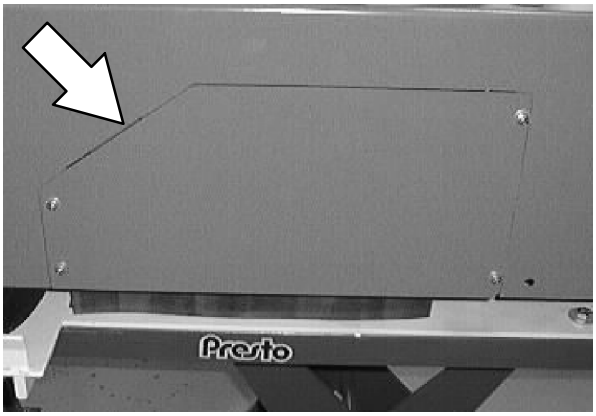


2. Open the left hand side brush door.

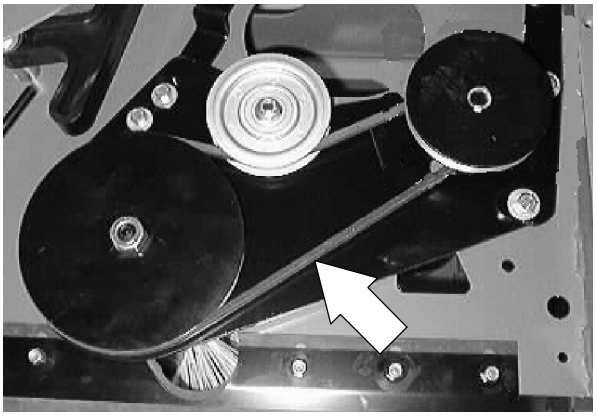
3. Remove the main brush idler mount plate and main brush. See TO REPLACE MAIN BRUSH instructions in this sections.



4. Remove the right hand brush door.

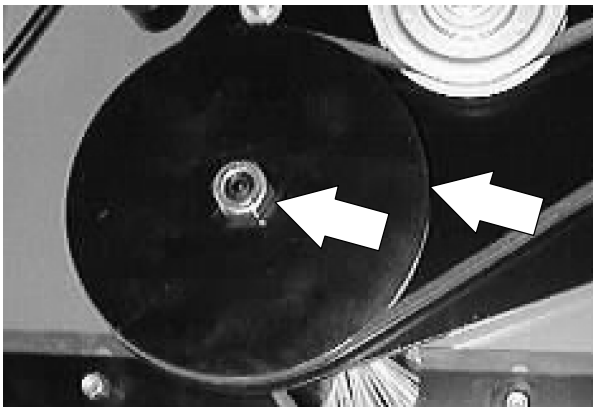


5. Remove the main brush drive belt. See TO REPLACE MAIN BRUSH DRIVE BELT instructions in this section.

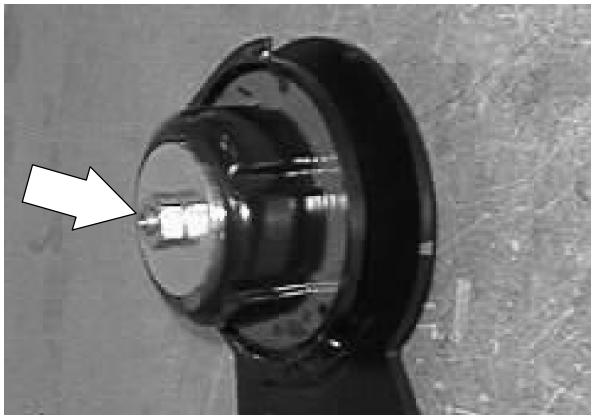


6. Hold the main brush V-belt pulley (large one) from turning. Remove the large nut from the center of this pulley. **NOTE: THIS IS A LEFT HAND THREAD NUT.**

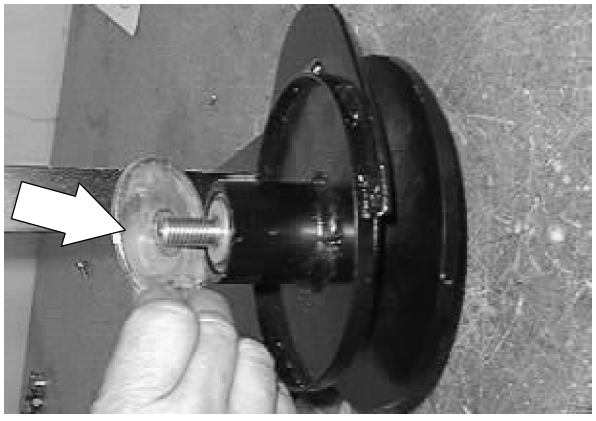
7. Remove the main brush V-belt pulley (larger one) from the main brush shaft. Make sure to retain the washer from behind the pulley.



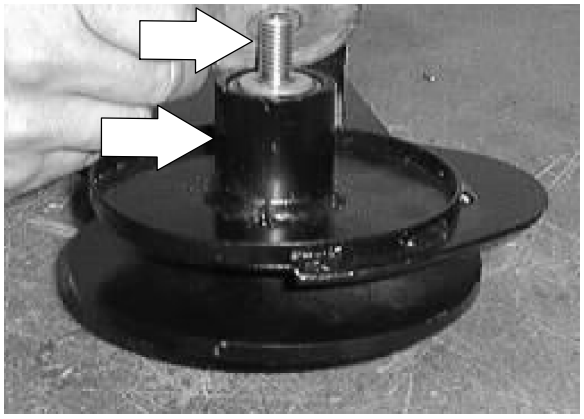
8. Hold the main brush drive plug from turning. Remove the large nut from the center of the drive plug. **NOTE: THIS IS A LEFT HAND THREAD NUT.**



9. Remove the main brush idler plug assembly from the main brush shaft



10. Reinstall the nut on the outside of the main brush shaft.

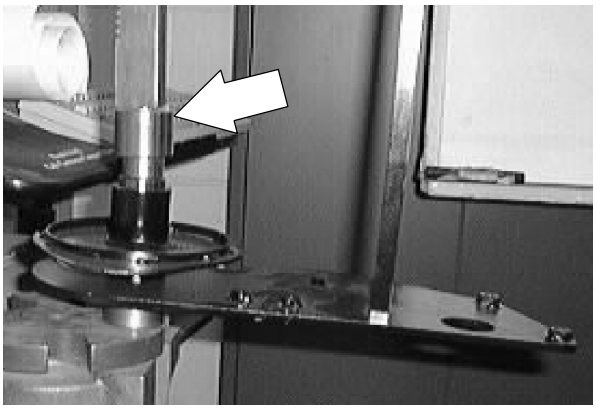


11. Use a hammer to lightly tap on the end of the shaft with the nut reinstalled. Tap on the shaft until the inner bearing is out of the housing.

12. Remove the nut from the main brush shaft. Remove the shaft and bearing from the machine.

13. Use a long screw driver or punch to remove the remaining outer bearing from the main brush housing. Discard the bearing.

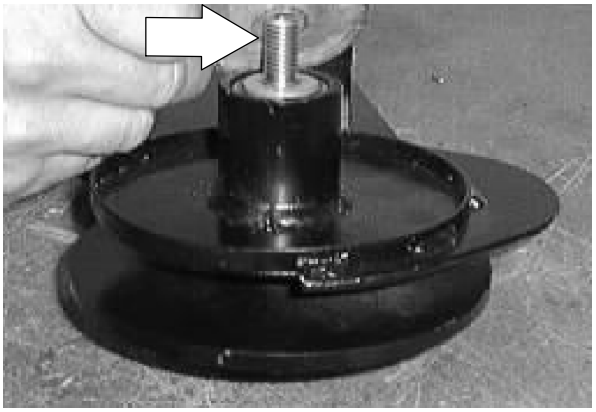
14. Use an arbor press to remove the bearing from the main brush shaft. Discard the bearing.



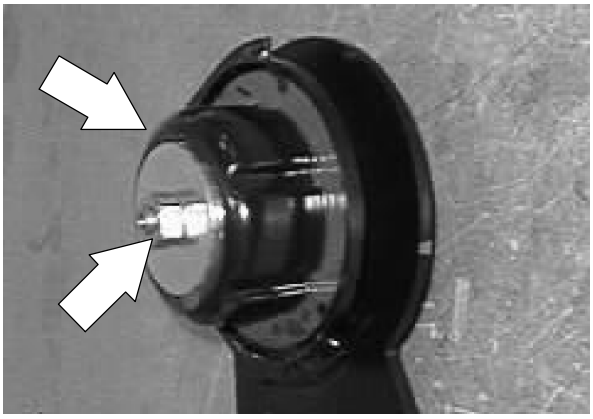
15. Install one new bearing onto the main brush shaft.

16. Install one new bearing into the outer side of the main brush housing.

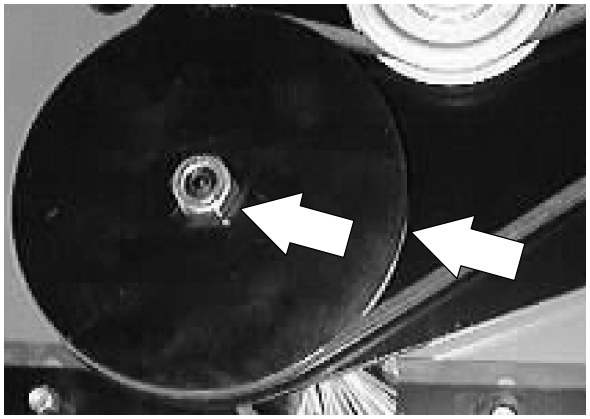
17. Install the new bearing and main brush shaft assembly into the main brush housing. Install one of the nuts onto the outside of the main brush shaft. Use a hammer to lightly tap the bearing and shaft into the housing.



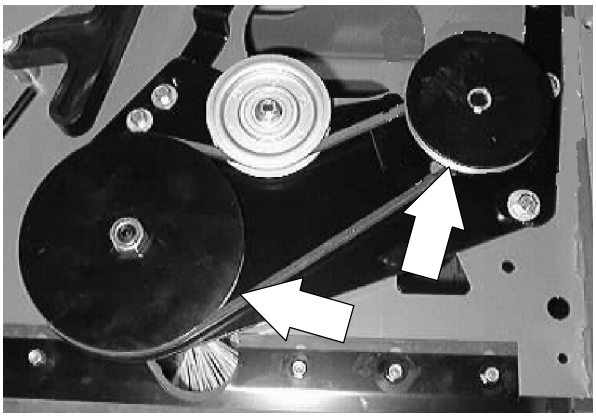
18. Reinstall the main brush drive plug onto the main brush shaft on the inside. Reinstall the left hand nut. Hand tighten tight. *Make sure the large washer is in place behind the brush plug.*



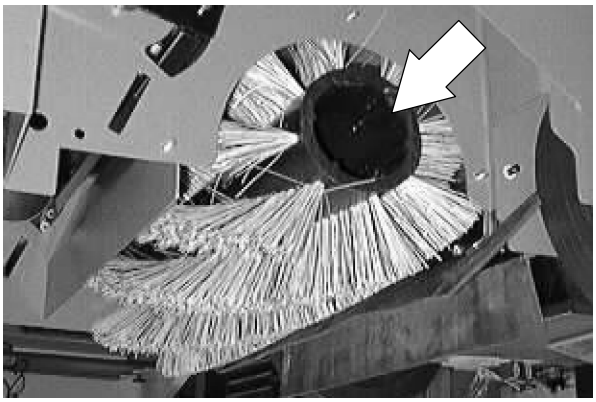
19. Reinstall the washer and V-belt pulley onto the outside of the main brush shaft. Reinstall the left hand nut. Tighten to 52 - 67 Nm (39 - 51 ft lb).



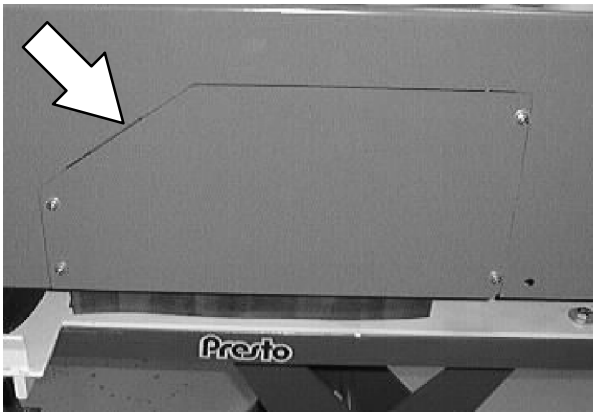
20. Reinstall the main brush drive belt. See TO REPLACE MAIN BRUSH DRIVE BELT instructions in this section.



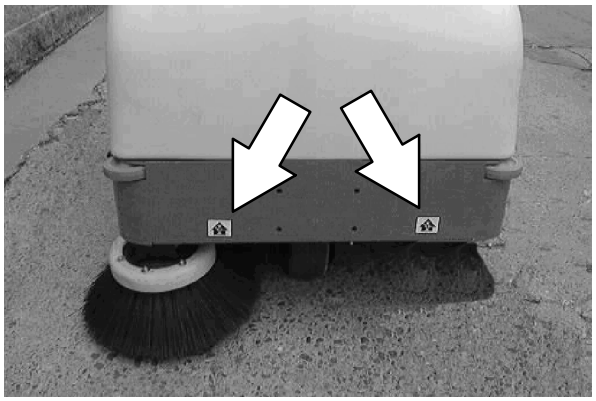
21. Reinstall the main brush. See TO REPLACE MAIN BRUSH instructions in this sections.



22. Reinstall the right hand brush door and close the left hand brush door.



23. Remove the jack stands and lower the machine.

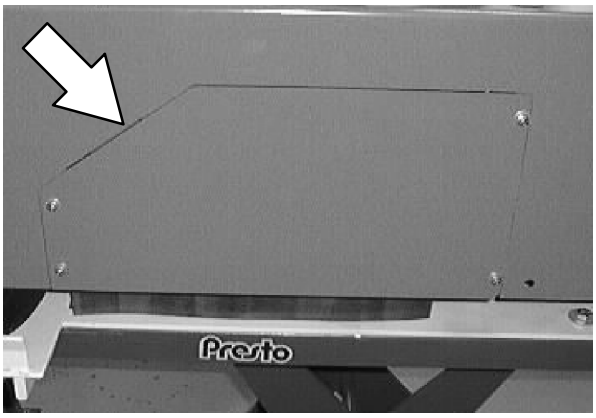


24. Operate the machine and check the main brush for proper operation.

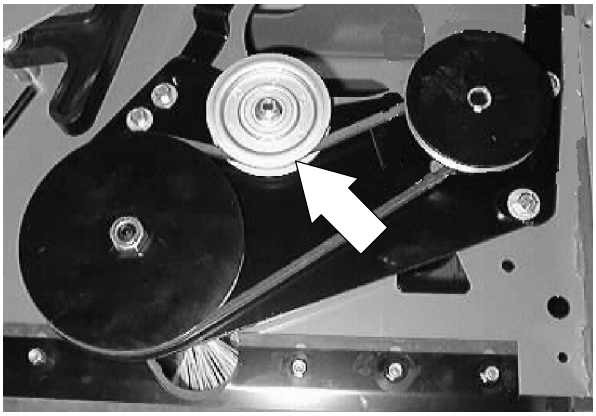
TO REPLACE MAIN BRUSH DRIVE BELT IDLER PULLEY

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake.

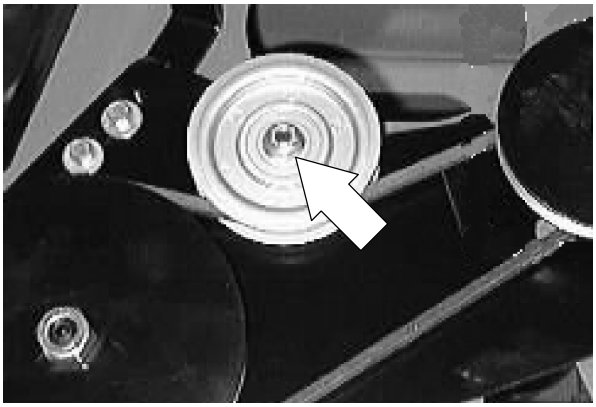
1. Remove the four screws holding the right hand brush door to the machine frame. Remove the right hand side brush door.



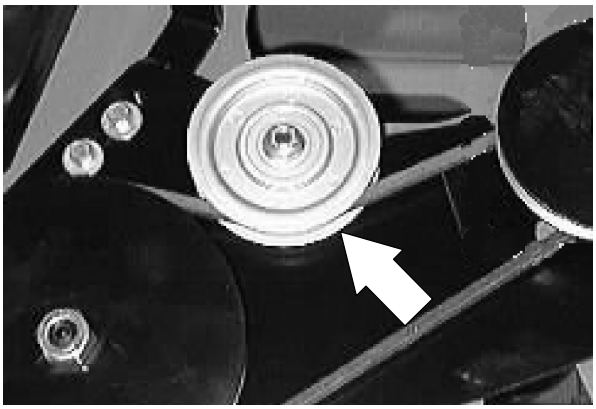
2. Locate the main brush drive belt idler pulley between the small jackshaft pulley and the larger brush pulley.



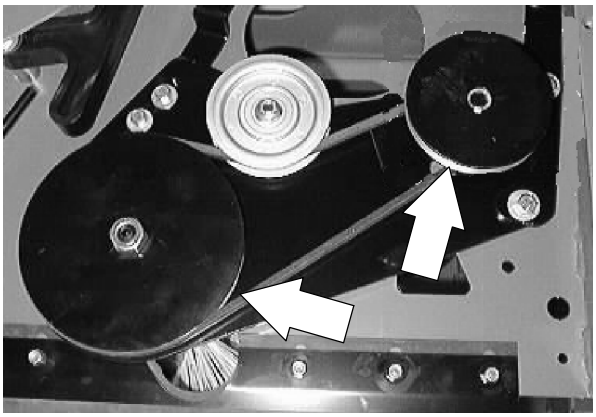
3. Loosen the hex nut in the center of the idler pulley.



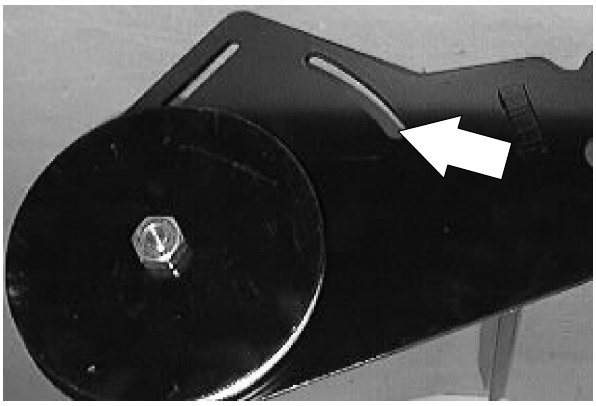
4. Push the idler pulley back in the slot.



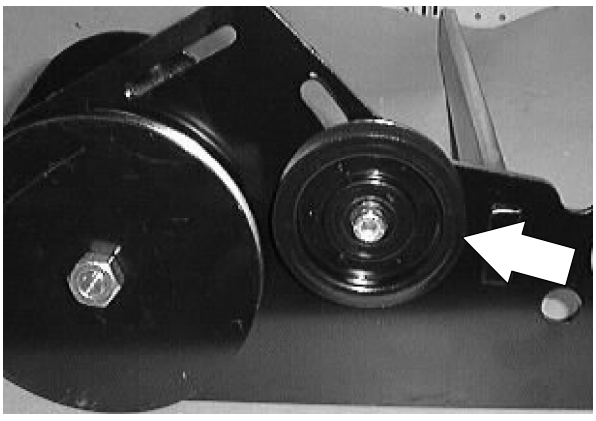
5. Remove the main brush drive belt from the two remaining pulleys.



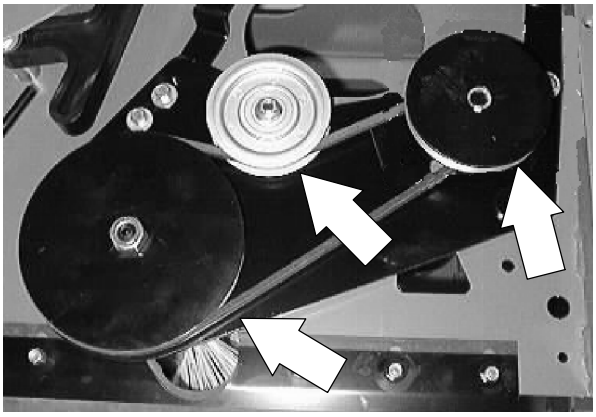
6. Remove the hex nut in the center of the idler pulley. Remove and discard the pulley.



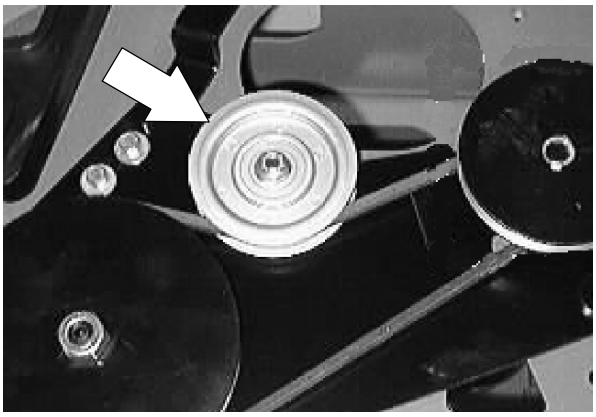
7. Install the new idler pulley onto the hex bolt. Reinstall the hex nut. Leave loose for now.



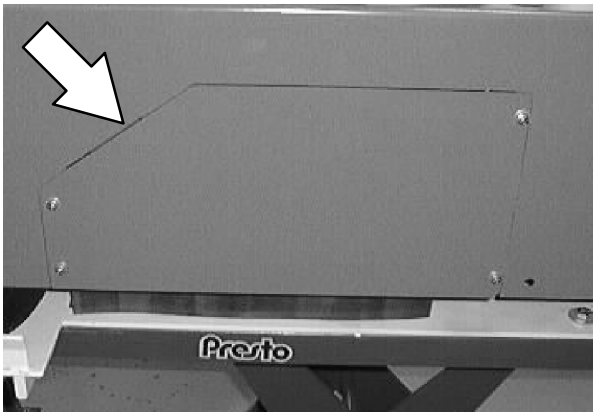
8. Reinstall the V-belt around the two drive pulleys and on top of the idler pulley.



9. Push down on the idler pulley until the belt is tight. Tighten the pulley nut to 18 – 24 Nm (15 – 20 ft lb).



10. Reinstall the right hand side brush door.

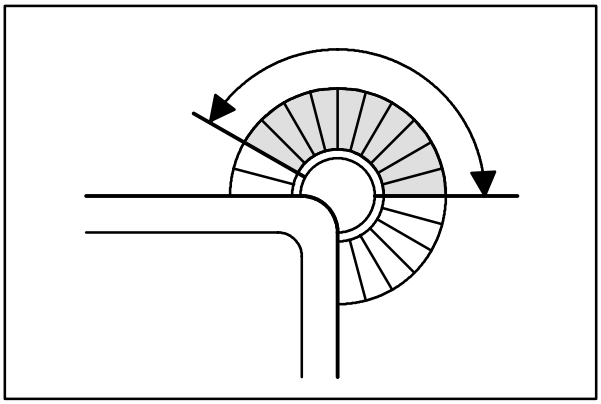


11. Operate the machine and check the main brush for proper operation.

SIDE BRUSH

The side brush sweeps debris along edges into the path of the main brush.

Check the brush daily for wear or damage. Remove any string or wire found tangled on the side brush or side brush drive hub.



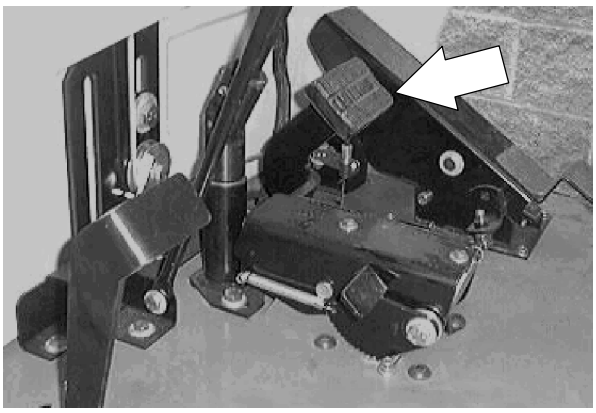
Check the side brush pattern daily. The side brush bristles should contact the floor in a 10 o'clock to 3 o'clock pattern when the brush is in motion. Adjust the side brush pattern by loosening the hex screw located above the side brush cable pulley in the front of the operators compartment. Move the pulley mount bracket up or down to achieve the proper side brush pattern. Retighten the hex screw.

The side brush should be replaced when it no longer sweeps effectively for your application. A guideline length is when the remaining bristles measure 50 mm (2 in) in length. You may need to replace the side brush sooner if you are sweeping light litter or use a brush with shorter bristles if you are sweeping heavy debris.

TO REPLACE SIDE BRUSH

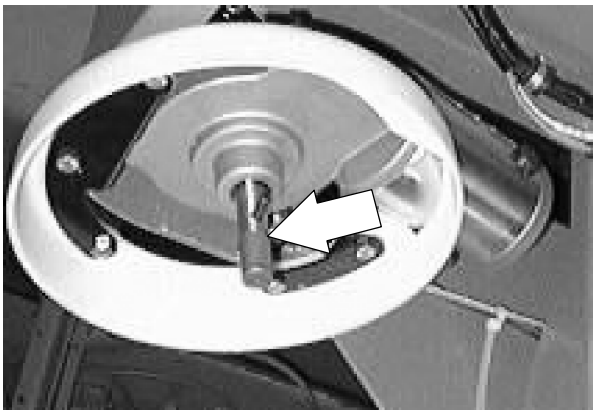
1. Stop the machine, set the parking brake and turn the machine power off.

   FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake.

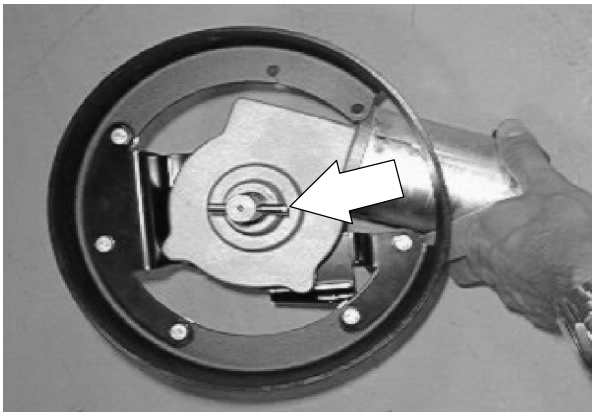


2. Remove the side brush retaining pin from the side brush drive shaft by pulling the pin keeper off over the end of the pin.

3. Slide the side brush off the side brush drive shaft.



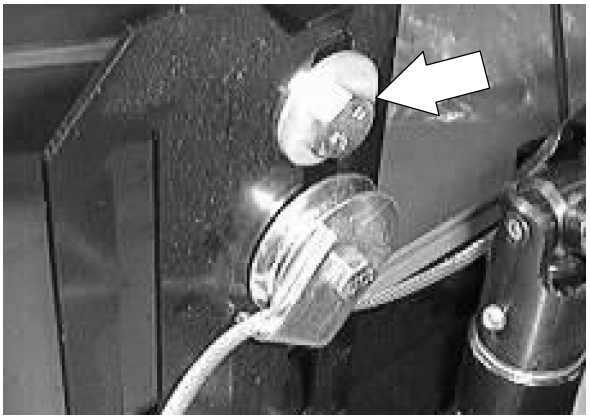
4. Slide the new side brush onto the side brush drive shaft.



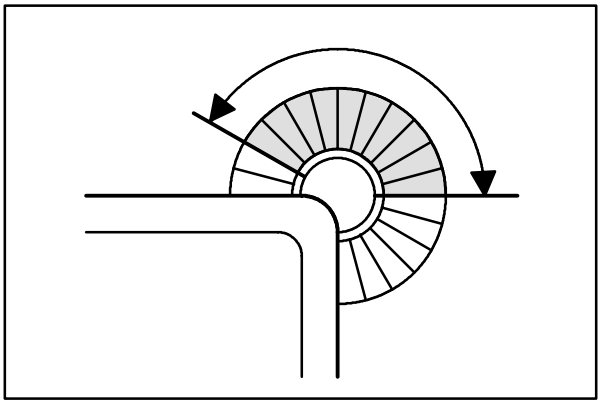
5. Insert the side brush retaining pin through the side brush hub and shaft.

6. Secure the pin by clipping the pin keeper over the end of the pin.

7. Adjust the side brush pattern by loosening the hex screw located above the side brush cable pulley in the front of the operators compartment.



8. Move the pulley mount bracket up or down to achieve the proper side brush pattern. Retighten the hex screw.

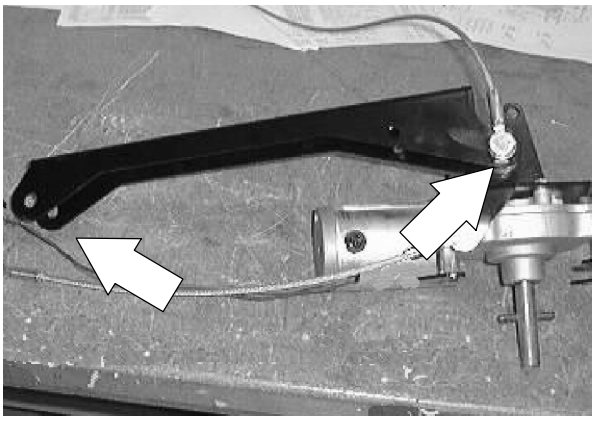


SIDE BRUSH GUARD

Check the side brush guard after every 200 hours of operation. Replace the brush guard after it begins to show serious wear.

SIDE BRUSH PIVOT

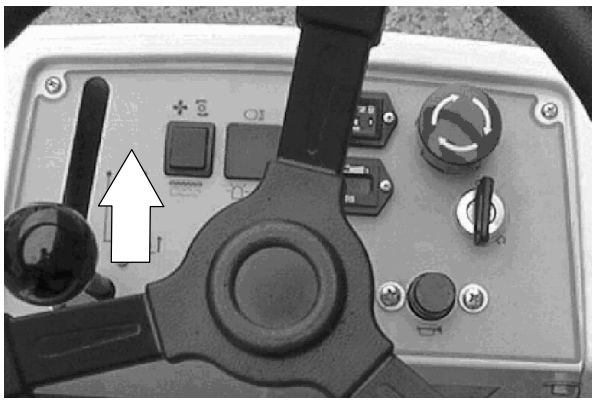
The side brush pivot should be checked for excessive movement after every 200 hours of operation. Torque the front and rear compression springs to reduce excessive movement.



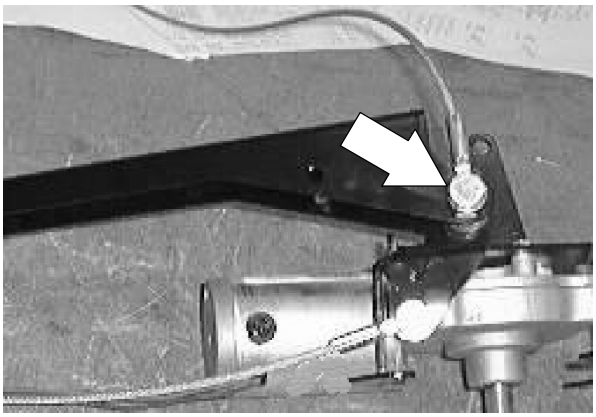
TO REPLACE SIDE BRUSH LIFT CABLE

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake.

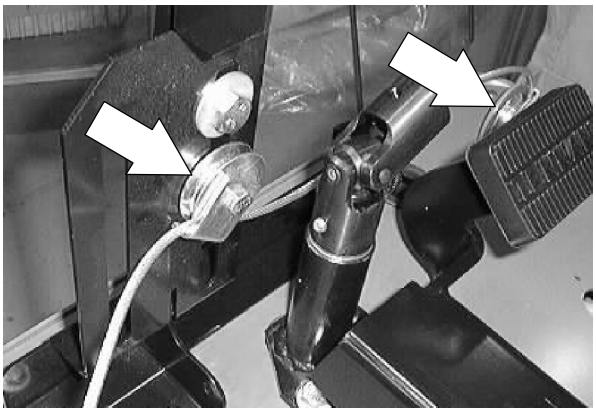
1. Lower the side brush handle.



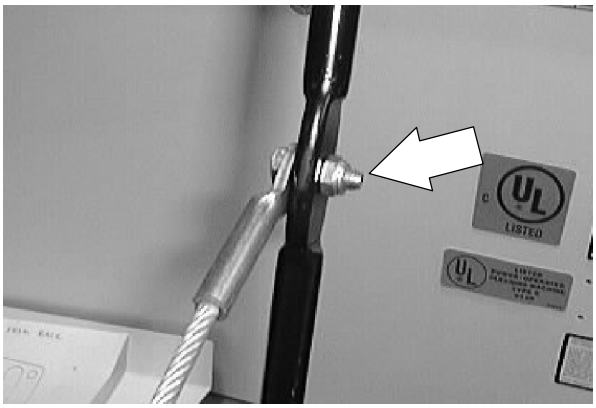
2. Go under the front of the machine near the side brush. Locate the side brush lift cable clevis under the brush pivot hex nut. Remove the nut only. Pull the side brush lift cable off the hex screw.



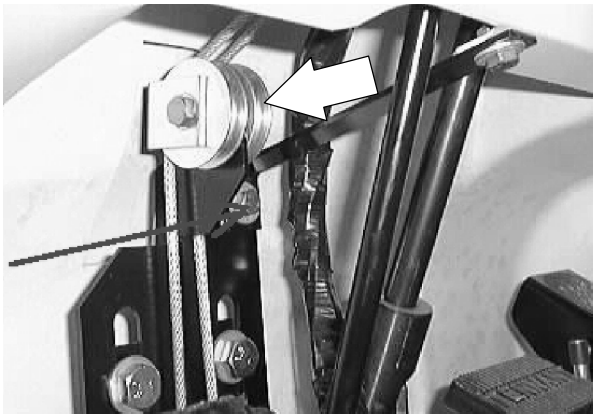
3. Go to the operators compartment. Remove the three cable pulleys, sleeves, and cable clips from the side brush lift assembly. Note the orientation of the cable clips for proper re-assembly.



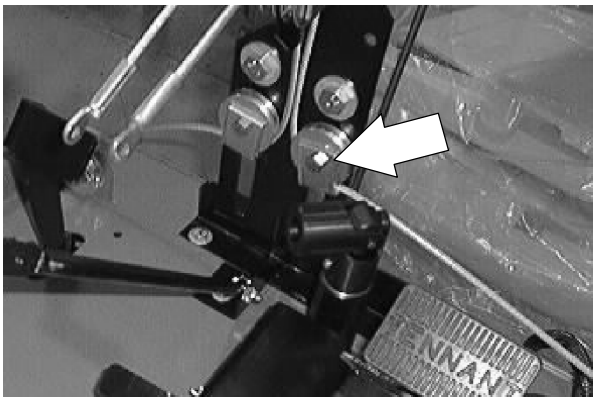
4. Go up under the instrument panel and remove the hex screw and nut holding the end of the side brush lift cable to the lift handle. Remove the side brush lift cable from the machine.



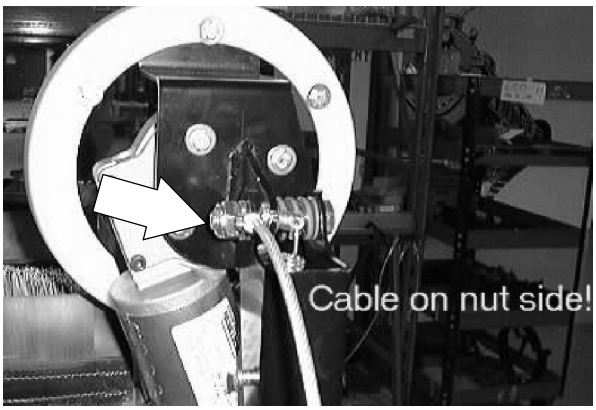
5. Route the new side brush lift cable in the machine.



6. Reinstall the three cable pulleys, sleeves, and cable clips. Make sure the cable clips are in the correct orientation. Tighten the hardware to 18 – 24 Nm (15 – 20 ft lb).



7. Connect the new side brush lift cable to the side brush pivot screw. Hand tighten the hex nut. Cable should pivot on the hardware.

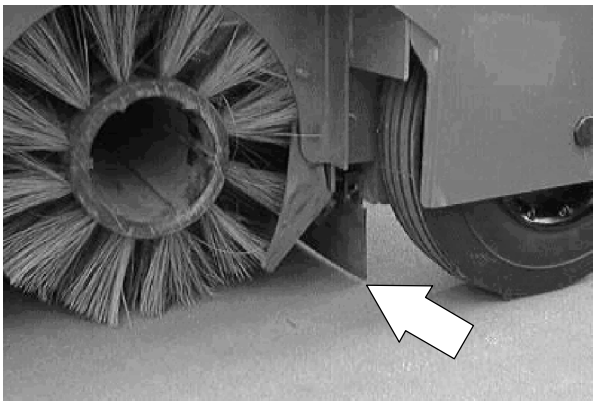


8. Raise the side brush.

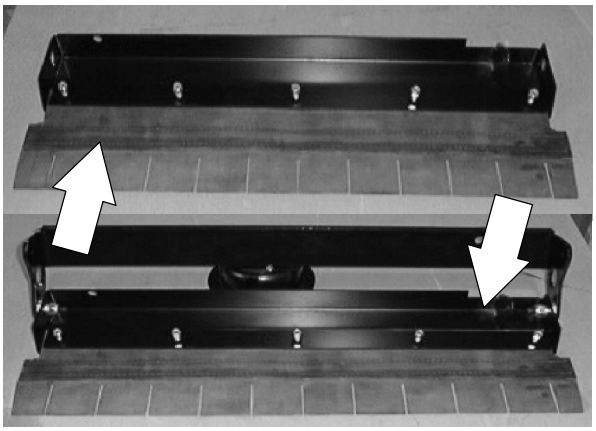
SKIRTS AND SEALS

REAR SKIRT

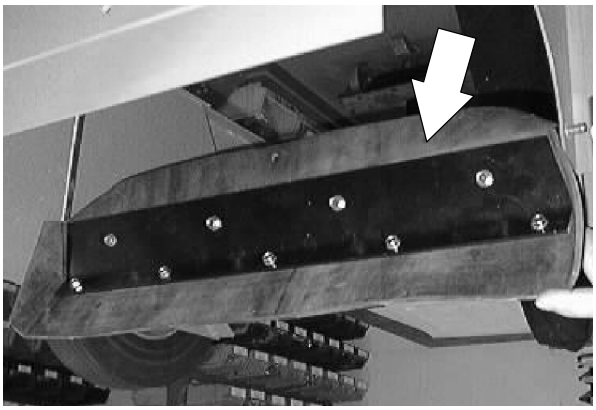
The two rear skirts are located on the bottom rear of the main brush compartment. The vertical skirt should clear the floor up to 2 mm (0.09 in). The recirculation skirt requires no adjustment.



Check the skirts for wear or damage and adjustment daily.

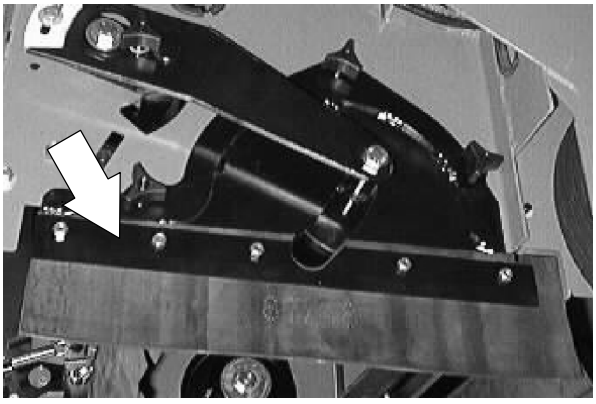


Note: The recirculation skirt must be folded in between the brush and the machine frame before the brush door is mounted on for the machine to work properly.



SIDE SKIRTS

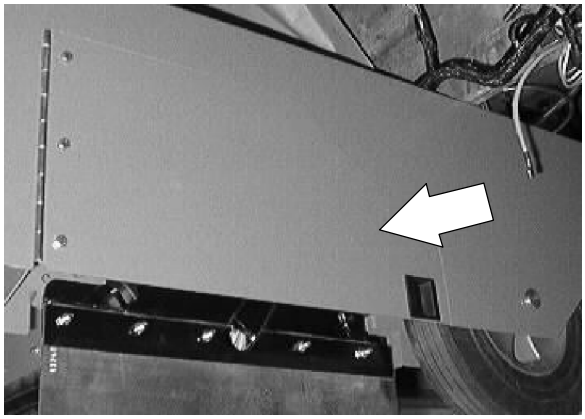
The side skirts are located on both sides of the main brush compartment. The skirts should clear the floor up to 5 mm.



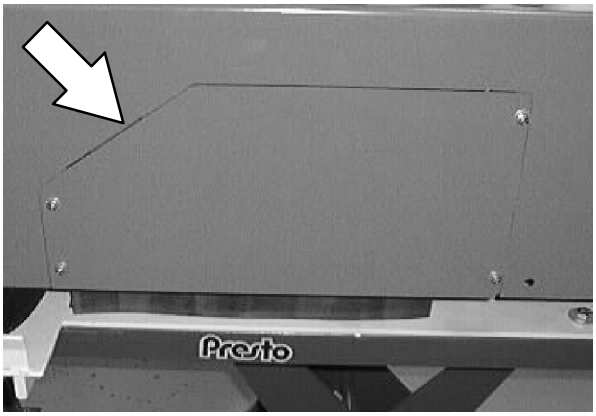
TO ADJUST SIDE SKIRTS

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake.

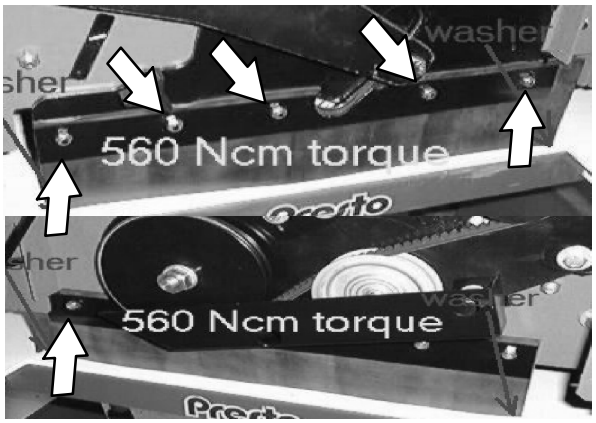
1. Open the LH brush door .



2. Remove the RH brush door.

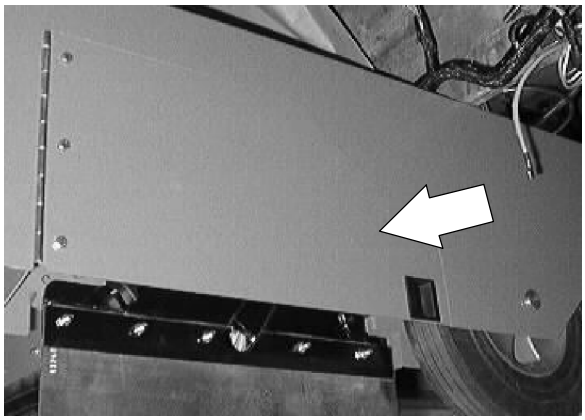


3. Loosen the hardware holding the side skirts to the frame.

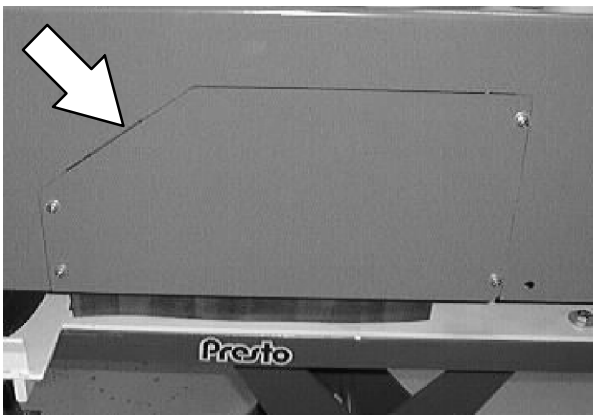


4. Place a flat washer under the bottom edge of the skirts. Make sure the skirt is touching the washer. Tighten the hardware to 560Ncm.

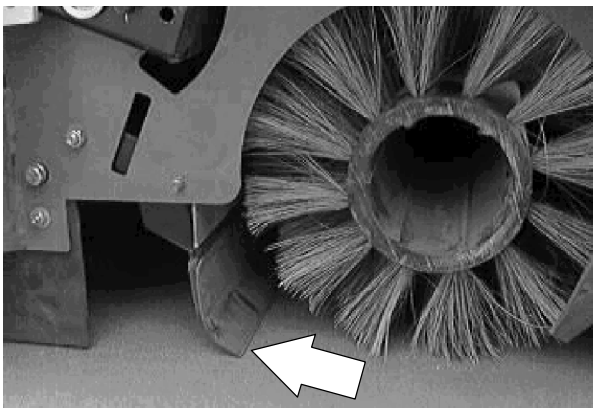
5. Close the LH brush door.



6. Reinstall the RH brush door.



LARGE DEBRIS TRAP SKIRT



The large debris trap skirt is located along the front of the main brush. This skirt is raised and lowered by the large debris trap pedal, allowing larger debris to be trapped and swept up into the hopper.

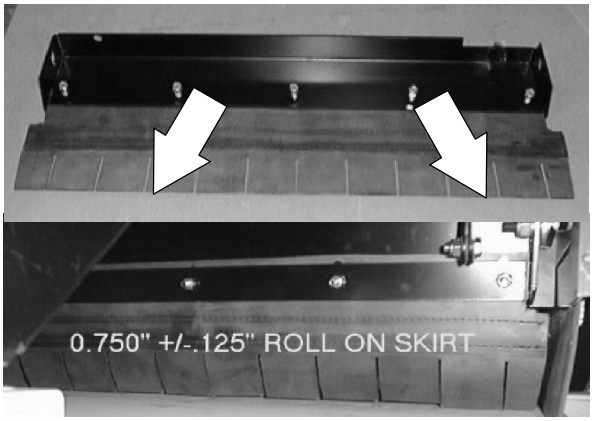
This skirt should be adjusted so it touches the floor and is curled back, toward the main brush **(curl back should be 3/4 inch =/- 1/4 inch).** Sweeping performance will be adversely affected if this skirt does not contact the floor.

Check the skirt for wear or damage after every 100 hours of operation.

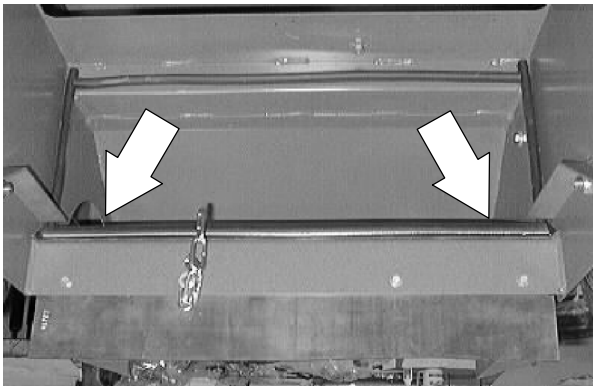
TO ADJUST FRONT FLAP SKIRT

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake.

1. The front flap skirt must roll to the rear of the machine .75 in (3/4 in) +/- .125 in (1/8 in)



HOPPER SEAL



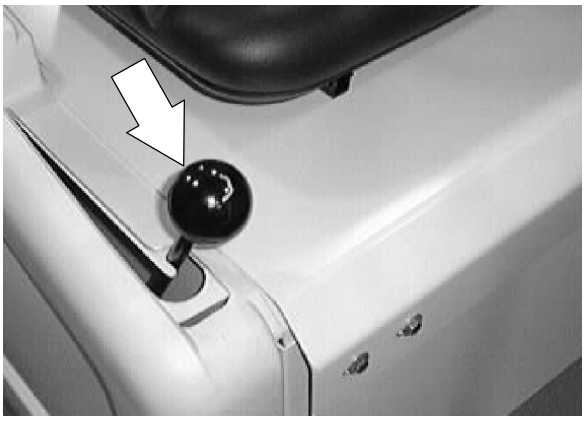
The hopper seal is located along the back of the main brush. The lower lip of the hopper rests on this seal when the hopper is setting in proper sweeping position.

Check the seal for wear or damage after every 100 hours of operation.

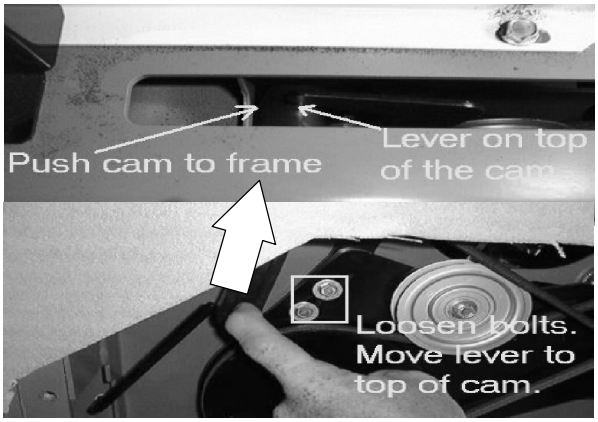
TO ADJUST RECIRCULATING SKIRT CAM.

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake.

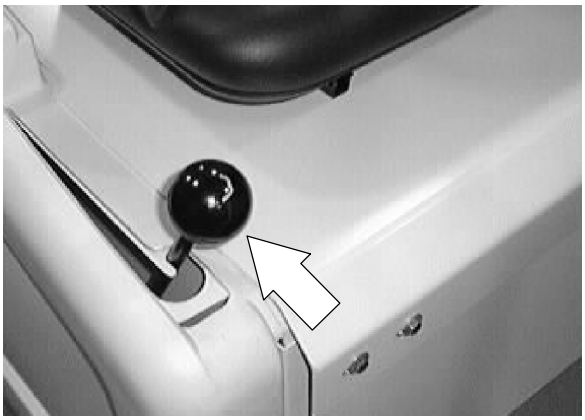
1. Pull the brush lift handle forward.



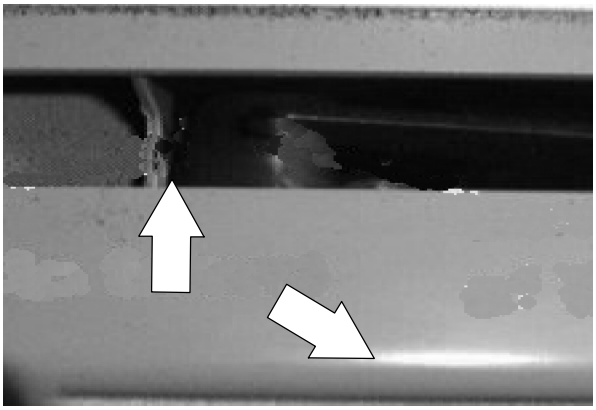
2. Lift the recirculation cam until it hits the frame.



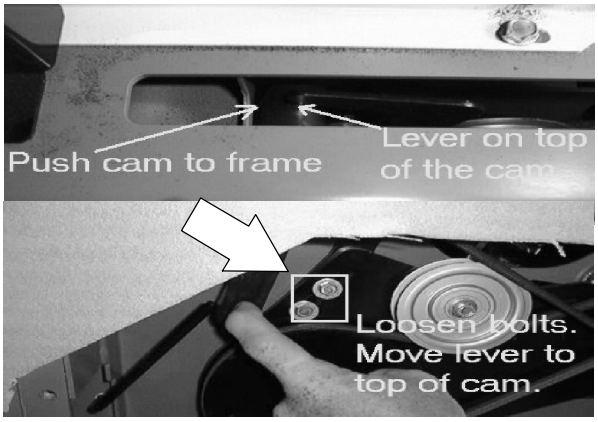
3. Slowly lower the brush lift handle to the down position.



4. If the cam follows the lever, do NOT adjust.



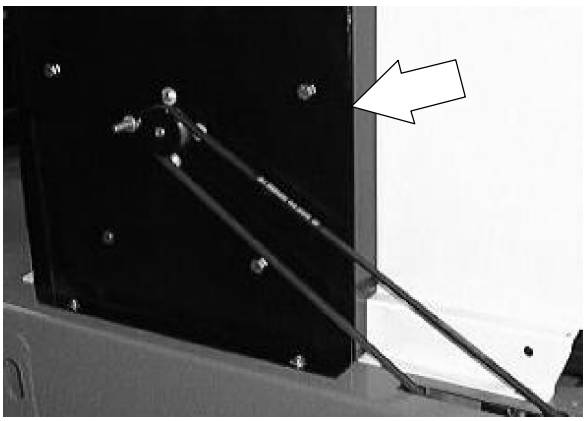
5. If the lever does not lower, Loosen the hardware and move the lever.



NOTE: The lever must not move to the front of the cam.

VACUUM FAN

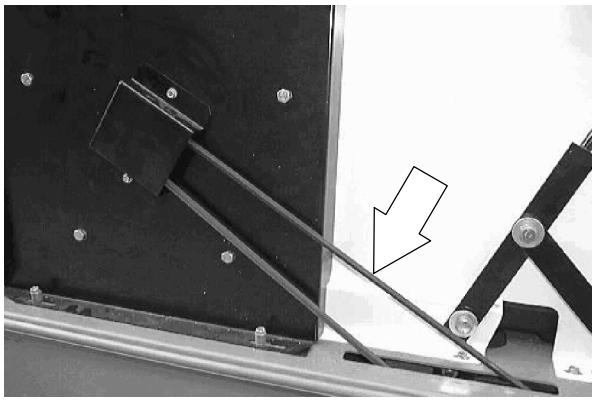
The vacuum system pulls dust and air into the hopper through the Instant Access™ filter. The vacuum fan is driven off the engine jack shaft.



VACUUM FAN BELT

Check the vacuum fan belt tension and wear after every 200 hours of operation. The correct tension is when the belt deflects 8.38 mm (0.33 in) from a force of .42 kg (.90 to .95 lb) at belt midpoint.

WARNING: Moving belt and fan. Keep away.

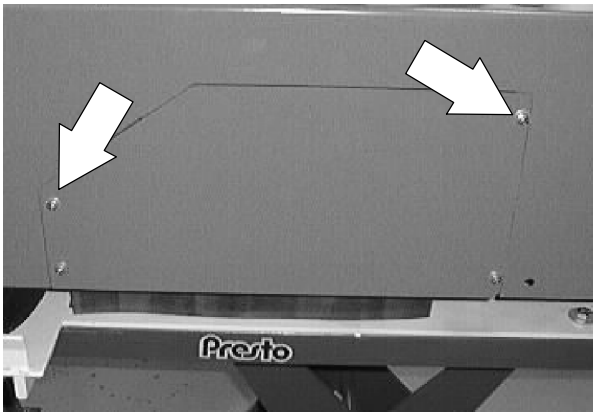


TO REPLACE VACUUM FAN DRIVE BELT

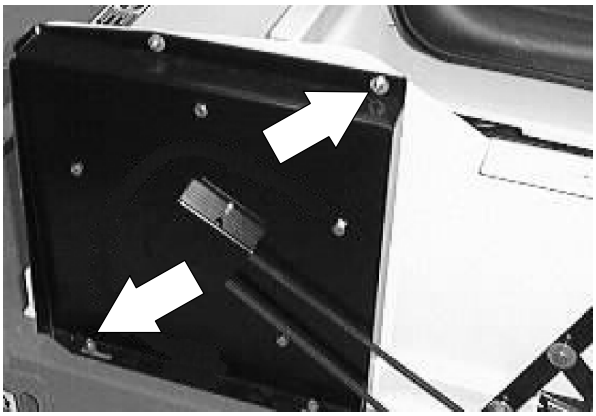
FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake.

1. To access the vacuum fan drive belt, remove the right hand side panel. Start by lifting up on the panel, pop the brush lift slot over the black knob, then move the panel backward and off the machine.

2. Remove the four screws holding the right hand brush door to the machine frame. Remove the right hand side brush door.

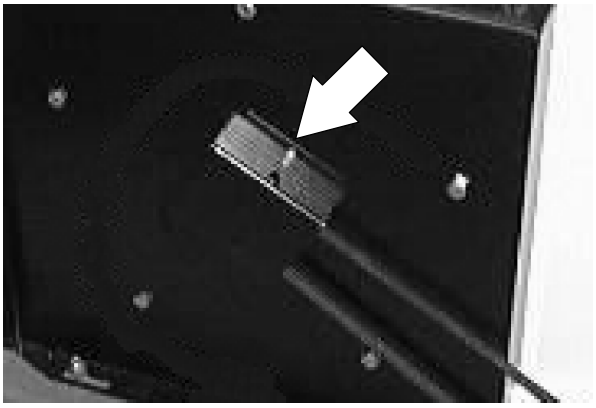


3. Loosen the four hex screws holding the vacuum fan housing to the machine frame.

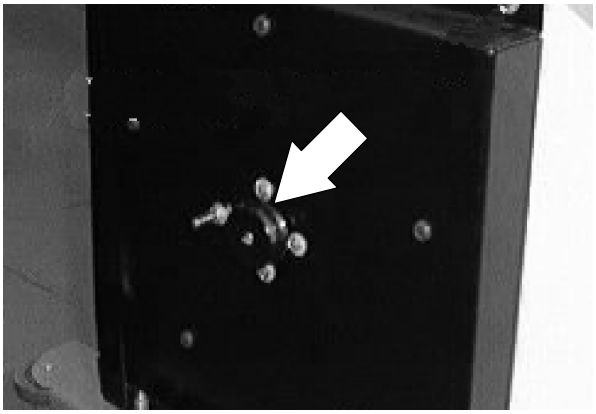


4. Push the vacuum fan assembly forward in the slots to loosen the vacuum fan V-belt.

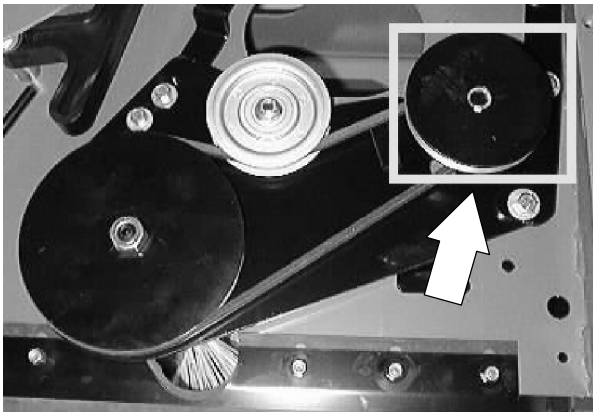
5. Remove the two hex screws holding the cover over the V-belt pulley. Remove the cover.



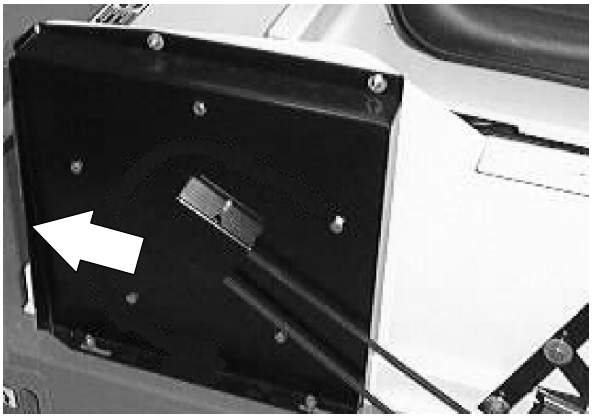
6. Remove the vacuum fan V-belt from both pulleys. Remove the old V-belt from the machine.



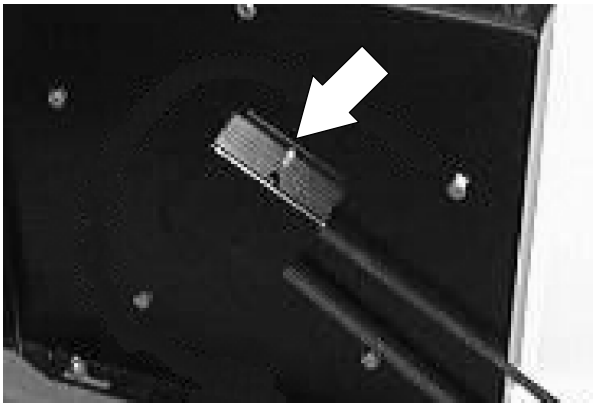
7. Install the new vacuum fan V-belt over both pulleys.



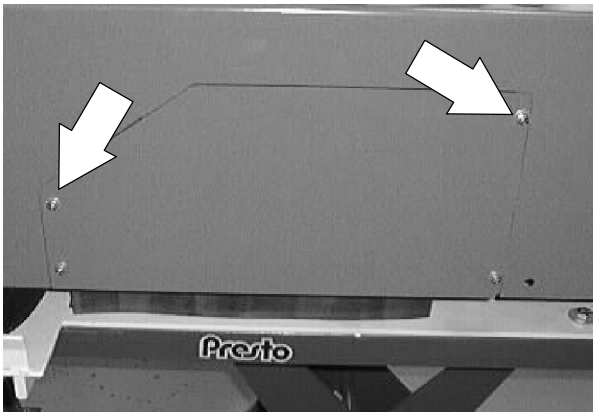
8. Pull the vacuum fan assembly toward the back of the machine to tighten the V-belt. The correct tension is when the belt deflects 8.38 mm (0.33 in) from a force of .42 kg (.90 to .95 lb) at belt midpoint. Tighten the screws hand tight.



9. Reinstall the V-belt cover. Tighten the two screws hand tight.



10. Reinstall the right hand side brush door.



11. Reinstall the right hand machine cover.

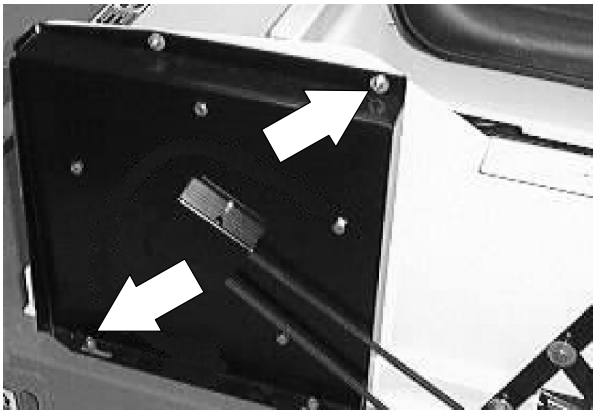
12. Operate the machine. Check the vacuum fan for proper operation.

TO TENSION VACUUM FAN DRIVE BELT

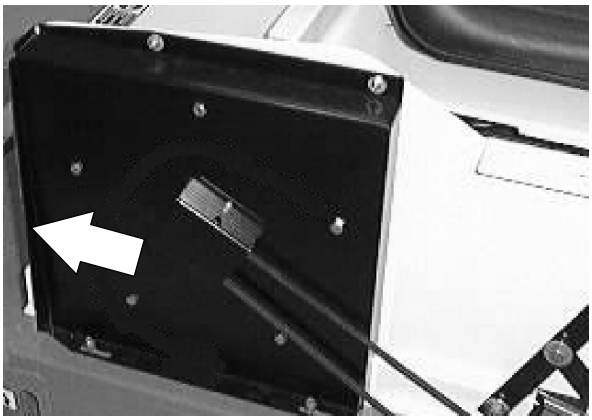
FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake.

1. To access the vacuum fan drive belt, remove the right hand side panel. Start by lifting up on the panel, pop the brush lift slot over the black knob, then move the panel backward and off the machine.

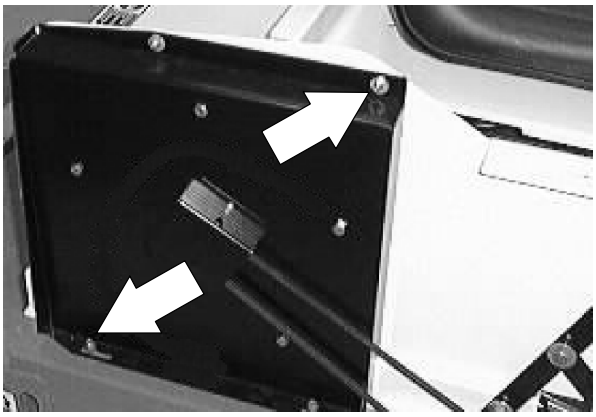
2. Loosen the four hex screws holding the vacuum fan housing to the machine frame.



3. Pull the vacuum fan assembly toward the back of the machine to tighten the V-belt. The correct tension is when the belt deflects 8.38 mm (0.33 in) from a force of .42 kg (.90 to .95 lb) at belt midpoint.

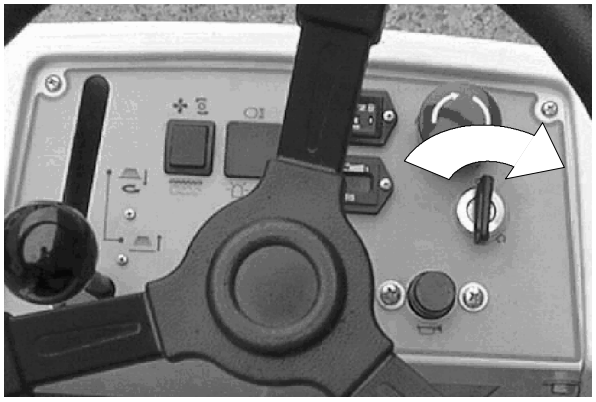


4. Tighten the four mounts screws hand tight.



5. Reinstall the right hand machine cover.

6. Operate the machine. Check the vacuum fan for proper operation.

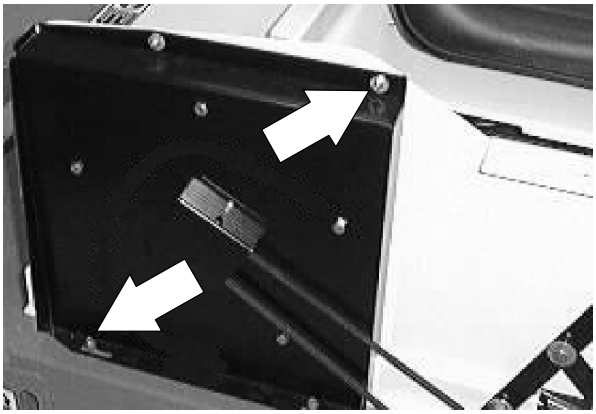


TO REPLACE VACUUM FAN IMPELLER

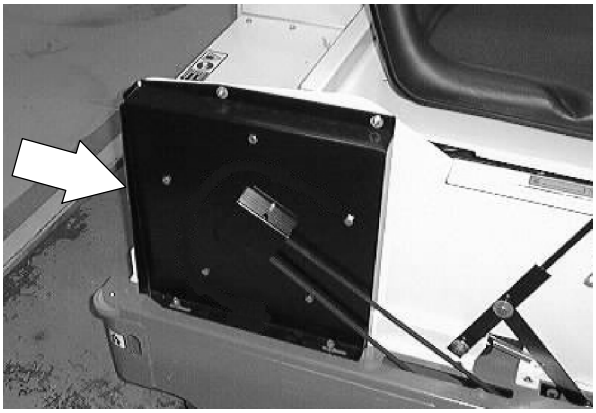
FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake.

1. To access the vacuum fan drive belt, remove the right hand side panel. Start by lifting up on the panel, pop the brush lift slot over the black knob, then move the panel backward and off the machine.

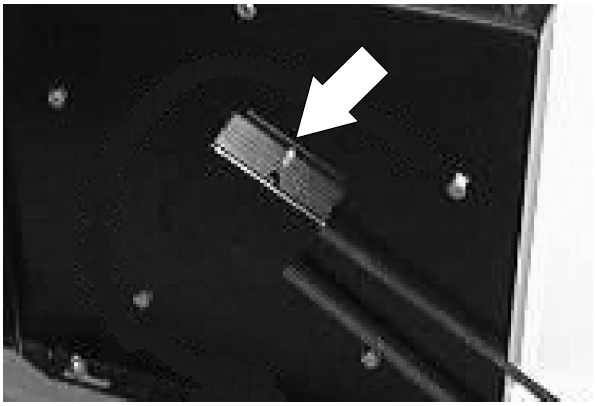
2. Loosen the four hex screws holding the vacuum fan housing to the machine frame.



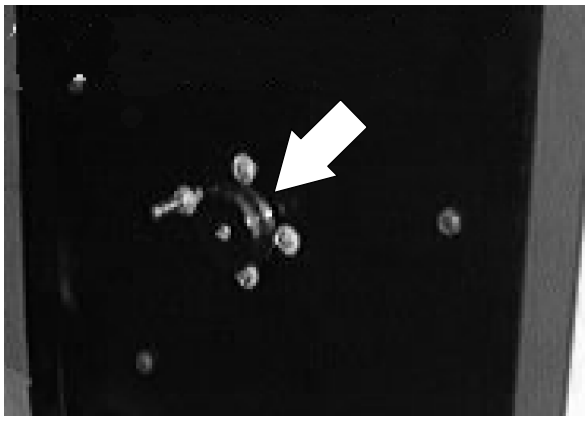
3. Push the vacuum fan assembly forward in the slots to loosen the vacuum fan V-belt.



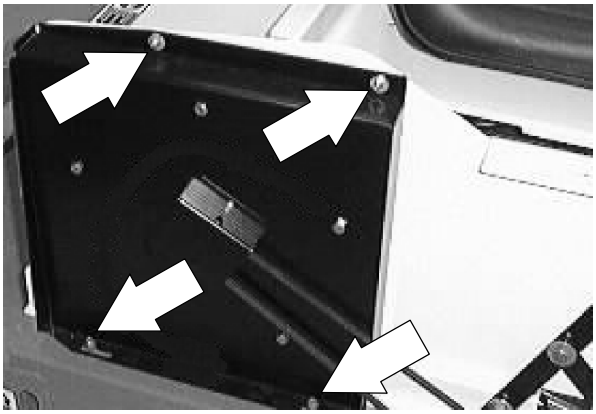
4. Remove the two hex screws holding the cover over the V-belt pulley. Remove the cover.



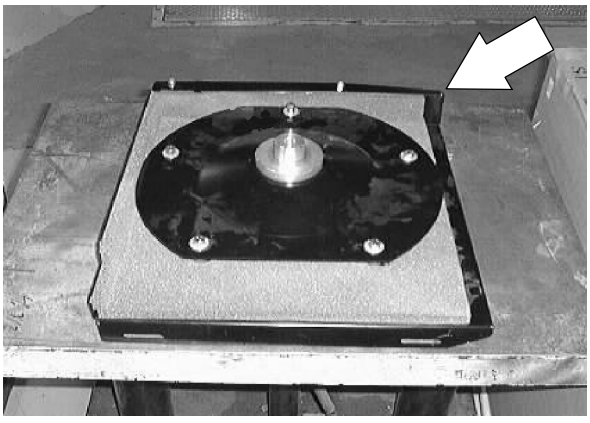
5. Remove the vacuum fan V-belt from the vacuum fan sheave.



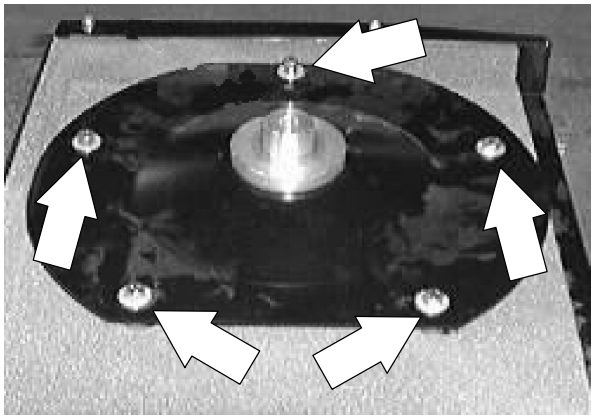
6. Remove the four hex nuts holding the vacuum fan assembly to the machine. Remove the assembly from the machine. *Make sure to retain the two steel sleeves from the bottom two hex screws.*



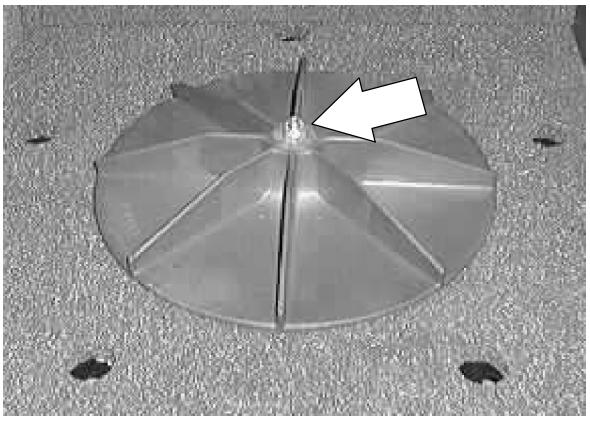
7. Place the assembly on a work bench with the vacuum fan inlet plate facing up.



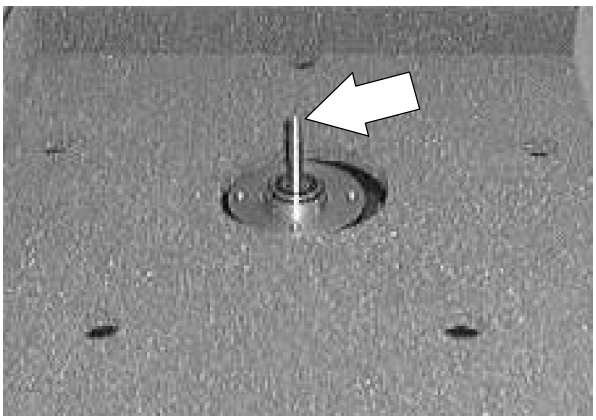
8. Remove the five hex screws and nuts holding the vacuum fan inlet plate to the bearing housing plate. Remove the inlet plate from the housing. *Make sure to retain the five steel sleeves.*



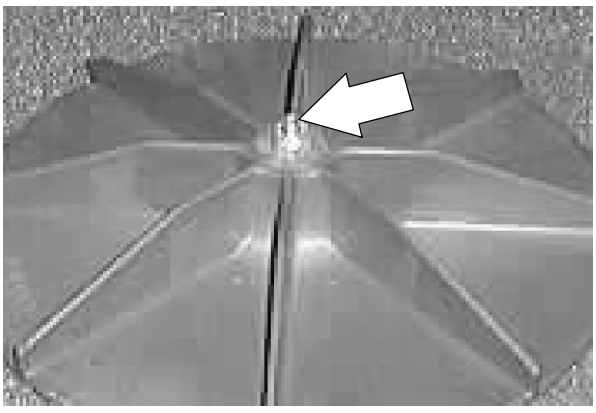
9. Remove the nyloc nut holding the vacuum fan impeller to the fan shaft. Pull the impeller off the shaft. *Make sure to retain the square key.*



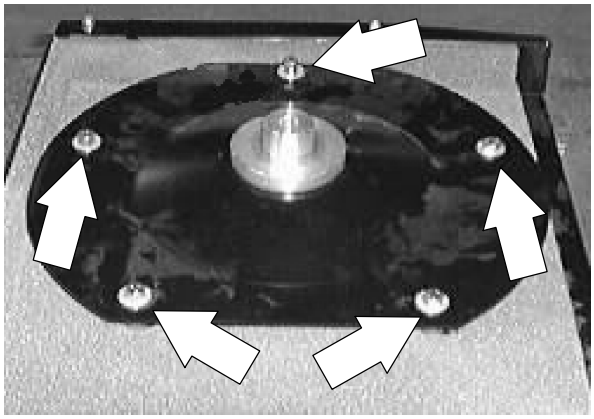
10. Install the new vacuum fan impeller onto the fan shaft. Make sure to reinstall the square key on the fan shaft.



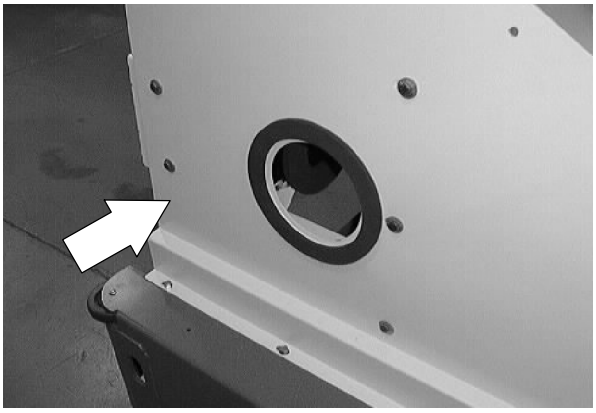
11. Reinstall the nyloc nut onto the fan shaft. Tighten to 11 – 14 Nm (7 – 10 ft lb).



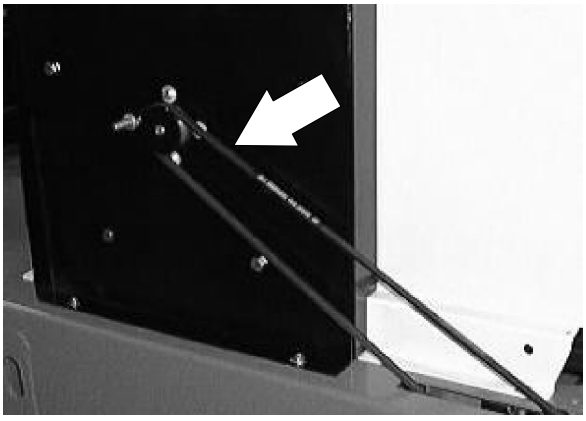
12. Reinstall the vacuum fan inlet plate onto the bearing housing plate. Reinstall the five steel sleeves, hex screws, and nuts. Center the hole in the plate over the impeller fins. Tighten the hardware to 18 – 24 Nm (15 – 20 ft lb).



13. Position the vacuum fan assembly onto the right side off the machine. Reinstall the four hex screws and nuts. Make sure to install the two steel sleeves on the bottom two hex screws. Leave the hardware loose for now.

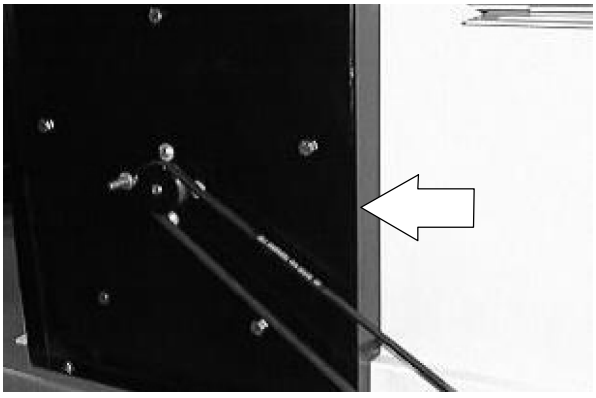


14. Install the vacuum fan V-belt over the vacuum fan sheave.

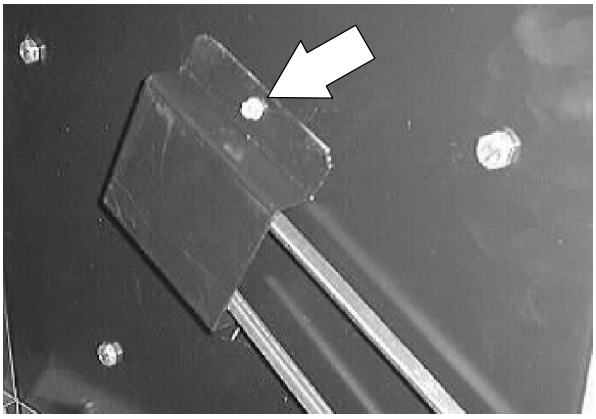


15. Pull the vacuum fan assembly toward the back of the machine to tighten the V-belt. The correct tension is when the belt deflects 8.38 mm (0.33 in) from a force of .42 kg (.90 to .95 lb) at belt midpoint.

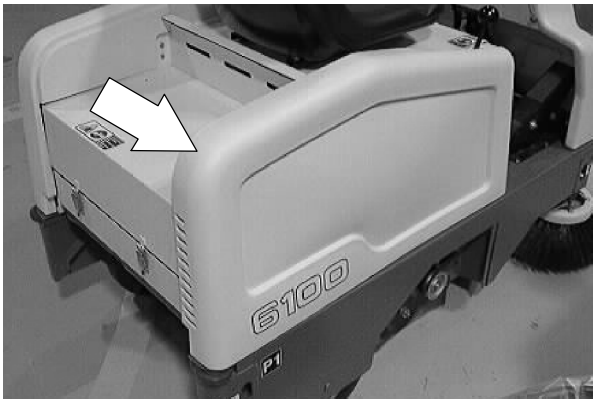
16. Tighten the four mounts screws hand tight.



17. Reinstall the V-belt cover. Tighten the two screws hand tight.



18. Reinstall the right hand machine cover.



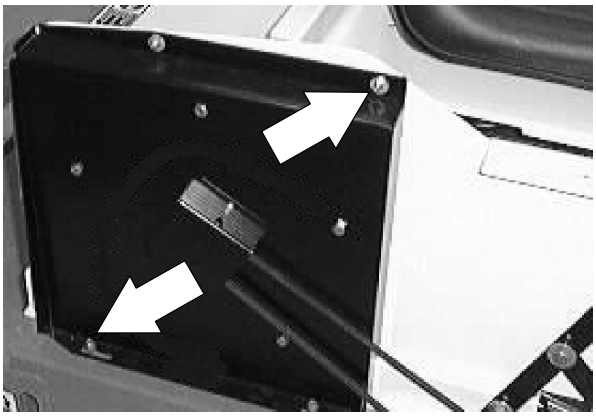
19. Operate the machine. Check the vacuum fan for proper operation.

TO REPLACE VACUUM FAN IMPELLER BEARINGS

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake.

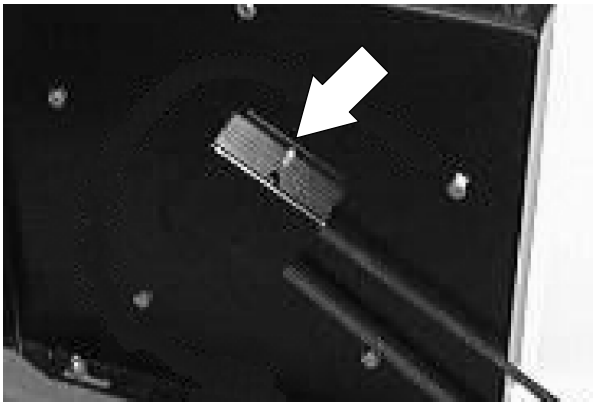
1. To access the vacuum fan assembly, remove the right hand side panel. Start by lifting up on the panel, pop the brush lift slot over the black knob, then move the panel backward and off the machine.

2. Loosen the four hex screws holding the vacuum fan housing to the machine frame.

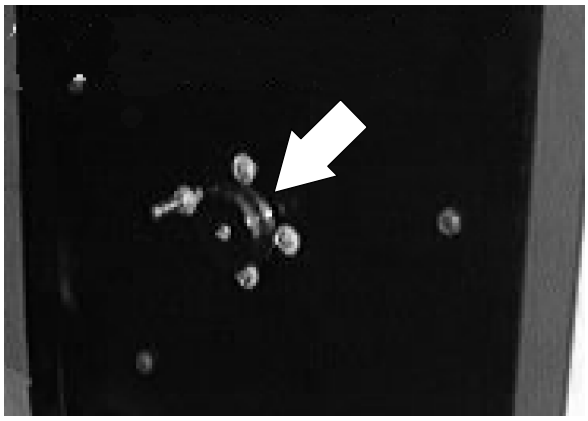


3. Push the vacuum fan assembly forward in the slots to loosen the vacuum fan V-belt.

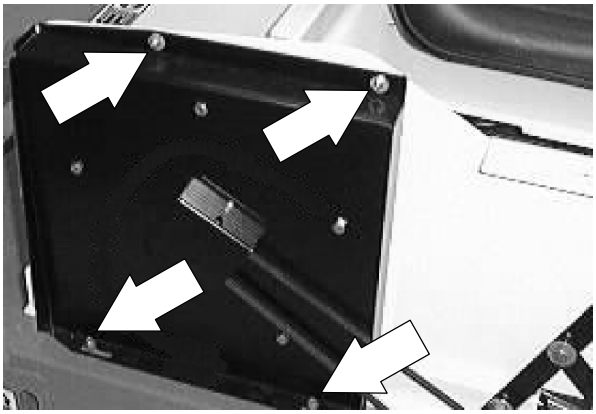
4. Remove the two hex screws holding the cover over the V-belt pulley. Remove the cover.



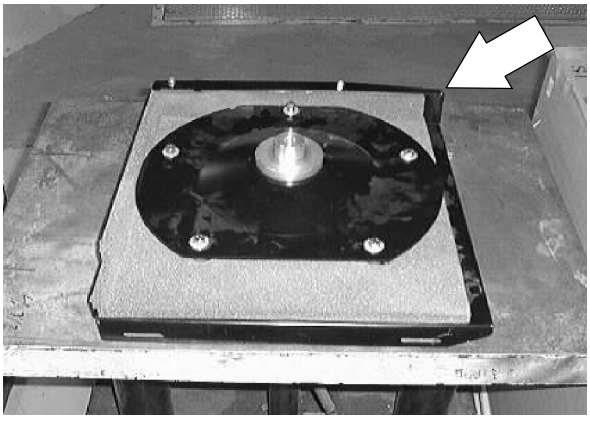
5. Remove the vacuum fan V-belt from the vacuum fan sheave.



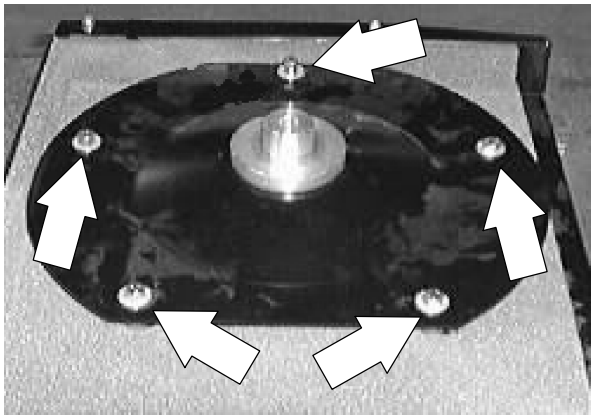
6. Remove the four hex nuts holding the vacuum fan assembly to the machine. Remove the assembly from the machine. *Make sure to retain the two steel sleeves from the bottom two hex screws.*



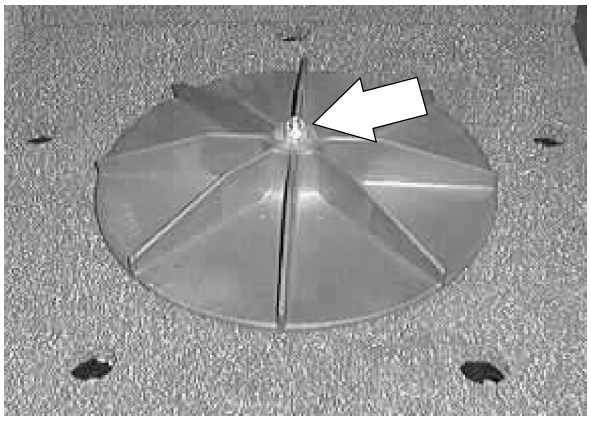
7. Place the assembly on a work bench with the vacuum fan inlet plate facing up.



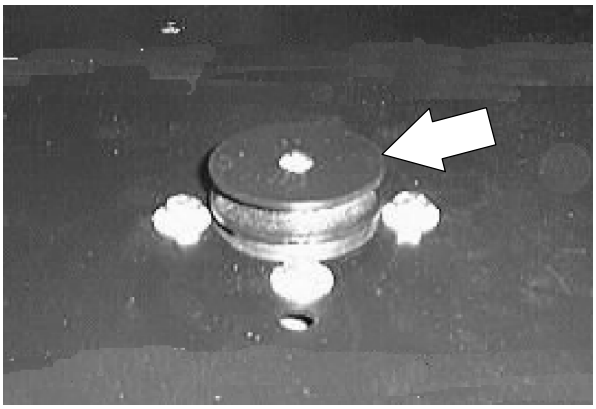
8. Remove the five hex screws and nuts holding the vacuum fan inlet plate to the bearing housing plate. Remove the inlet plate from the housing. *Make sure to retain the five steel sleeves.*



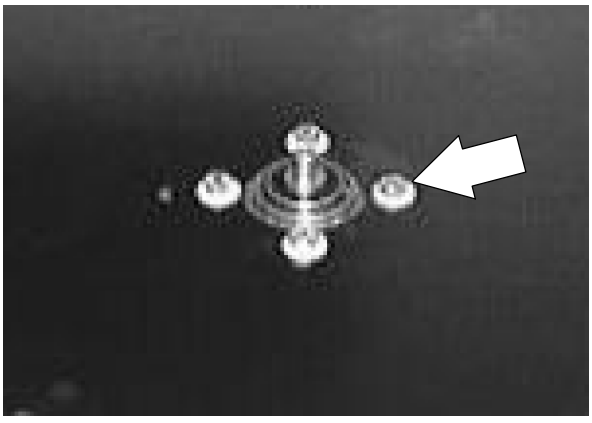
9. Remove the nyloc nut holding the vacuum fan impeller to the fan shaft. Pull the impeller off the shaft. *Make sure to retain the square key.*



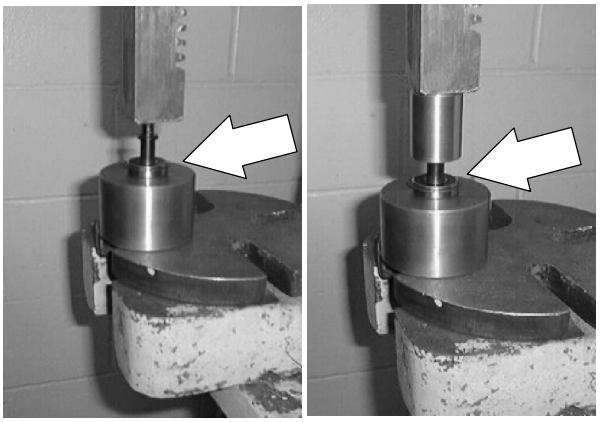
10. Loosen the two set screws holding the V-belt pulley to the fan shaft. Remove the pulley.



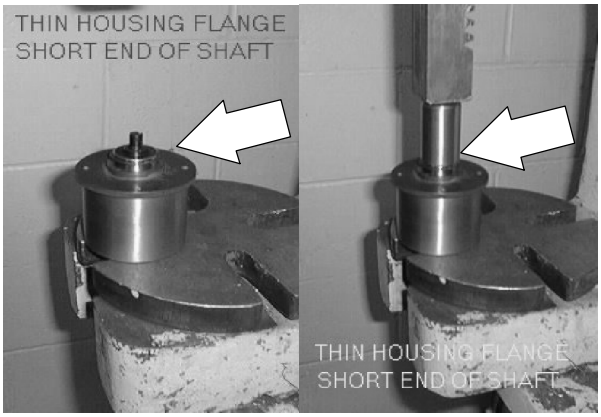
11. Remove the four hex screws holding the vacuum fan bearing assembly to the bearing plate. Remove the bearing assembly.



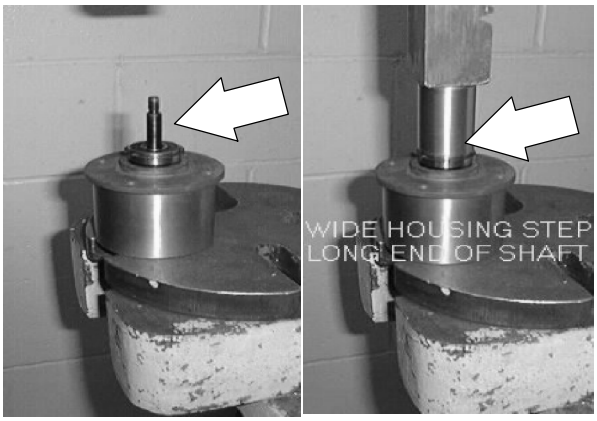
12. Use a arbor press to remove the fan shaft and two bearings from the housing.



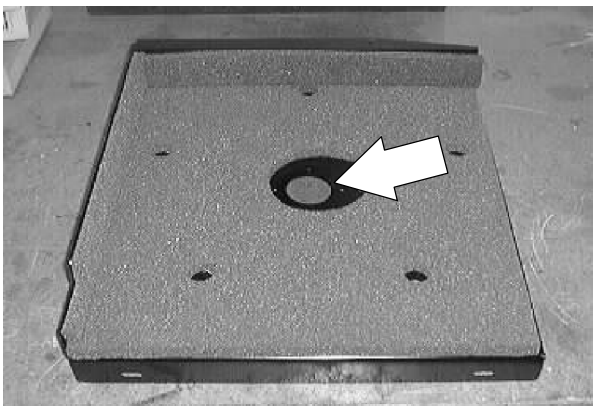
13. Use the arbor press to install the new bearings **and spacer washer** (between bearings) into the housing. *The short end of fan shaft is on the side of housing with the thin flange. The long end of fan shaft is on the side of the housing with the wide flange.*



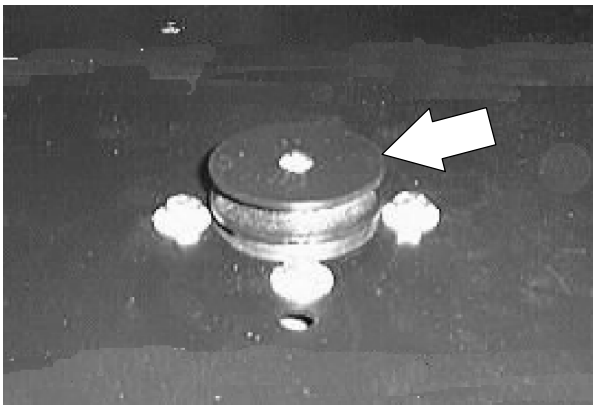
NOTE: Make sure the bearings are pressed down tight. The fan will be noisy if there is any play in the bearings. The retaining rings must be tight to the housing.



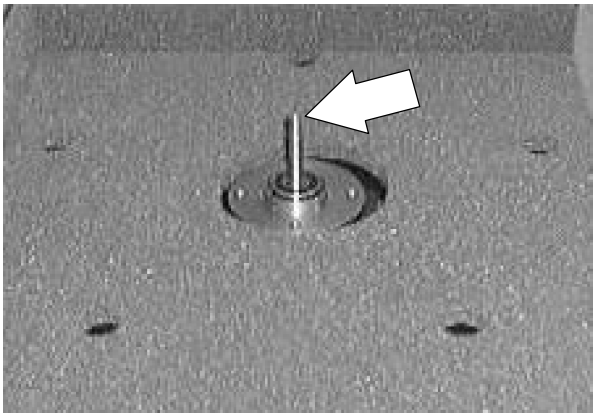
14. Reinstall the bearing housing onto the bearing housing plate. The long end of the shaft is on the side with the sound foam. Reinstall the four hex screws and washers. Tighten to 8 – 10 Nm (6 – 8 ft lb).



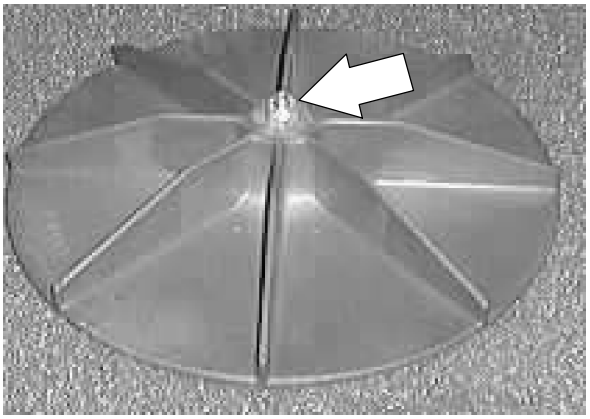
15. Reinstall the V-belt pulley on the short end of the fan shaft. *The recessed side of the pulley goes to the inside*. Hand tighten the set screws tight.



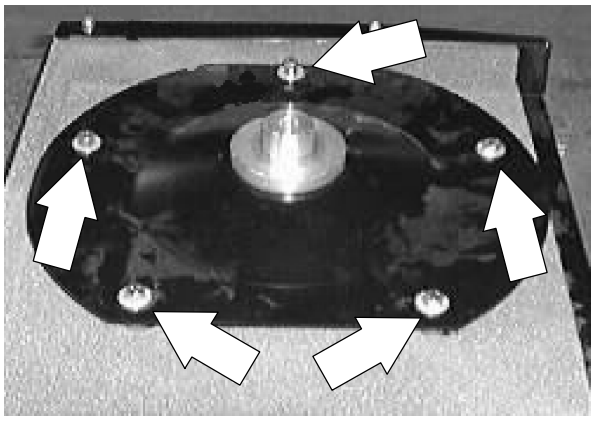
16. Reinstall the vacuum fan impeller onto the fan shaft. Make sure to reinstall the square key on the fan shaft.



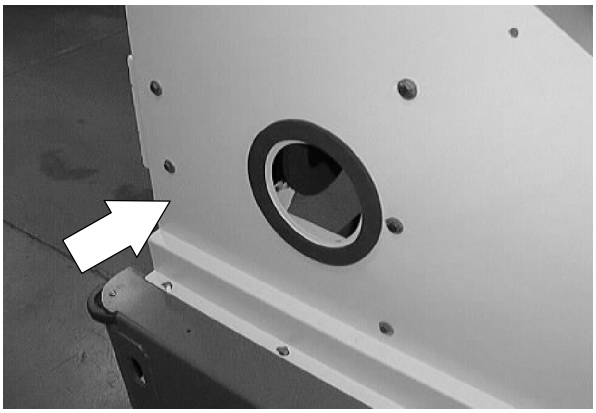
17. Reinstall the nyloc nut onto the fan shaft. Tighten to 11 – 14 Nm (7 – 10 ft lb).



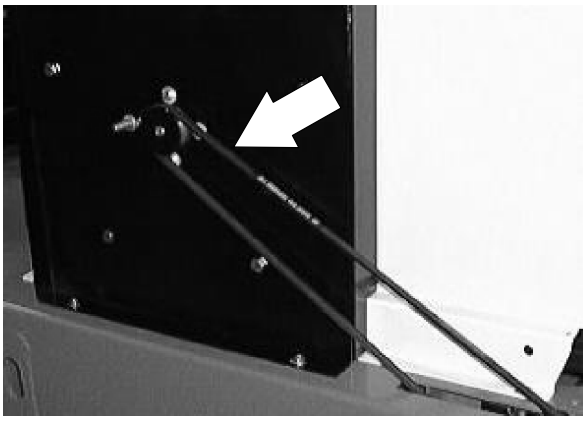
18. Reinstall the vacuum fan inlet plate onto the bearing housing plate. Reinstall the five steel sleeves, hex screws, and nuts. Center the hole in the plate over the impeller fins. Tighten the hardware to 18 – 24 Nm (15 – 20 ft lb).



19. Position the vacuum fan assembly onto the right side off the machine. Reinstall the four hex screws and nuts. Make sure to install the two steel sleeves on the bottom two hex screws. Leave the hardware loose for now.

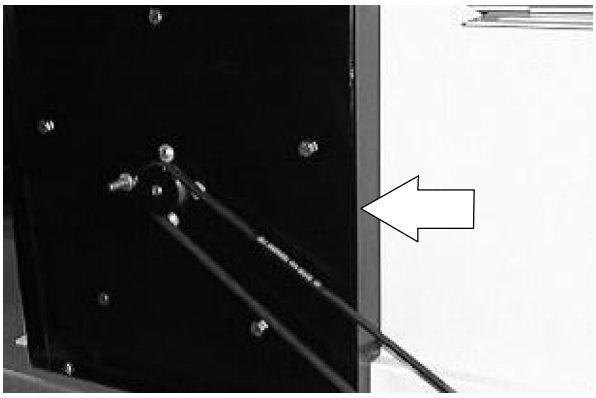


20. Install the vacuum fan V-belt over the vacuum fan sheave.

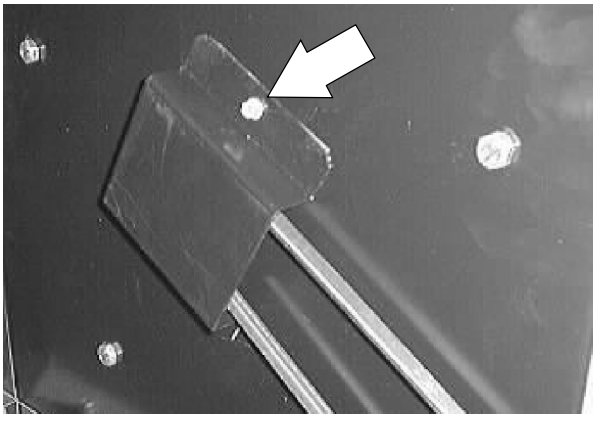


21. Pull the vacuum fan assembly toward the back of the machine to tighten the V-belt. The correct tension is when the belt deflects 8.38 mm (0.33 in) from a force of .42 kg (.90 to .95 lb) at belt midpoint.

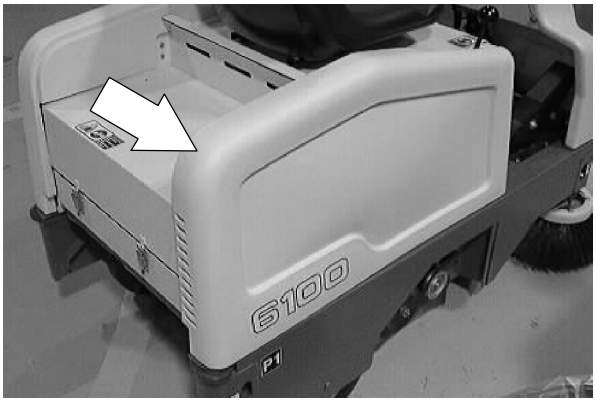
22. Tighten the four mounts screws hand tight.



23. Reinstall the V-belt cover. Tighten the two screws hand tight.



24. Reinstall the right hand machine cover.



25. Operate the machine. Check the vacuum fan for proper operation.

MACHINE TROUBLESHOOTING

Problem	Cause	Remedy
Excessive dusting	Vacuum fan off	Press the main brush, vacuum and filter shaker switch to the on position
	Brush skirts and dust seals worn, damaged, out of adjustment	Replace or adjust brush skirts or dust seals
	Hopper dust filter clogged	Shake and/or clean or replace dust filter
	Hopper fire door closed	Open hopper fire door
	Hopper full	Empty hopper
	Vacuum fan failure	Contact Tennant service personnel
Poor sweeping performance	Brush bristles worn	Replace brushes
	Main and side brushes not adjusted properly	Adjust main and side brushes
	Debris caught in main brush drive mechanism	Remove debris from drive mechanism
	Main brush drive failure	Contact Tennant service personnel
	Side brush drive failure	Contact Tennant service personnel
	Hopper full	Empty hopper
	Hopper lip skirts worn or damaged	Replace lip skirts
	Wrong sweeping brush	Contact Tennant representative for recommendations
	Large debris trap damaged	Repair or replace large debris trap
	Hopper dust filter clogged	Shake and/or clean or replace dust filter
	Operator not in seat	Sit in operator seat
Machine will not start	Engine oil level low	Check and fill
	Fuel tank valve closed	Open valve – LPG tank valve or valve below gasoline tank

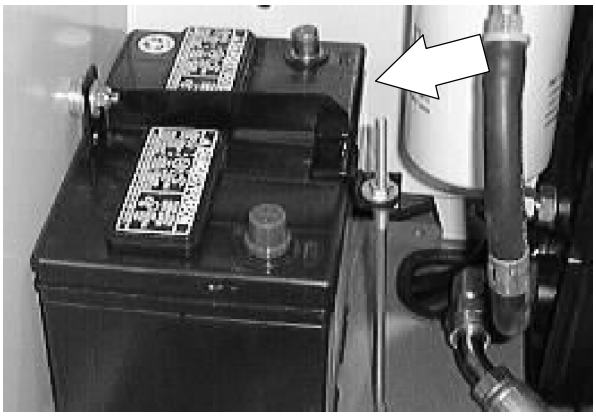
CONTENTS

INTRODUCTION

The model 6100G/LP electrical system consists of the battery, instrument panel, side brush motor, switches, relays, and circuit breakers.

BATTERY

The battery is located under the operator's seat and can be accessed by lifting the seat up.



After the first 50 hours of operation, and every 200 hours after that, clean and tighten the battery connections.

Check the electrolyte level every 200 hours of operation. Only add distilled water.

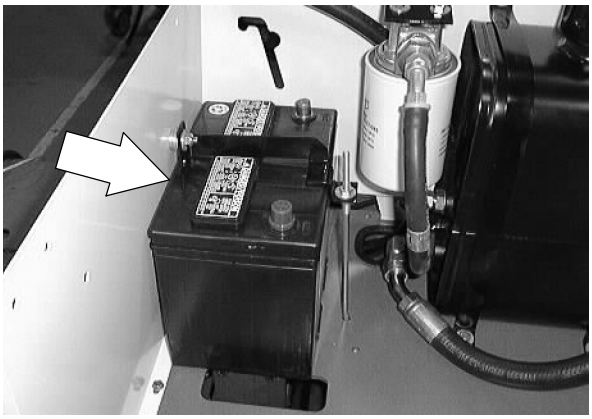
FOR SAFETY: When Servicing Machine, Avoid Contact With Battery Acid.

TO CHARGE BATTERY

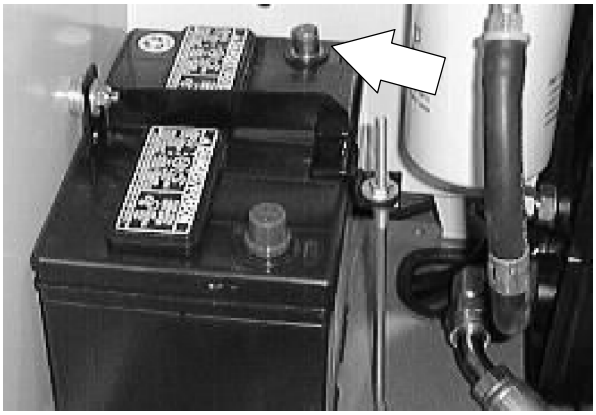
FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake, turn off machine, and remove key.

1. Open the seat support and engage the prop rod.

2. Locate the battery at the center of the machine, in front of the hydraulic tank.



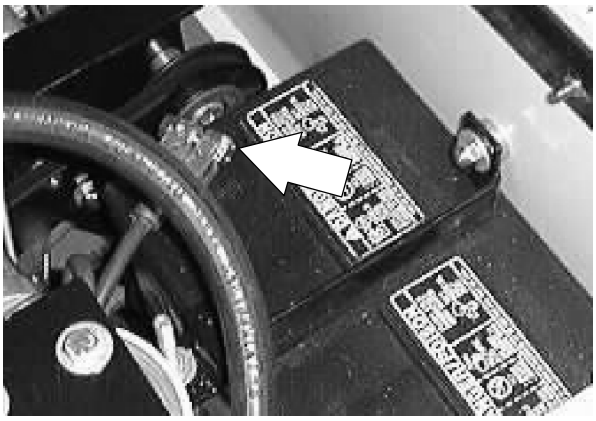
3. Remove the battery negative cable.



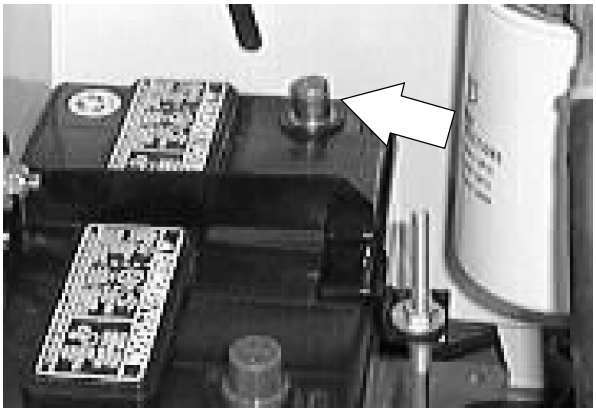
4. Connect the battery charger to the battery. Make sure to hook the red clamp on the positive post and the black clamp to the negative post.

5. Start the charger. Check the voltage meter on the charger for proper charge voltage.

6. Remove the charger after the voltage meter reads a full charge.



7. Reinstall the negative battery cable and start the machine. Check the battery for proper operation.

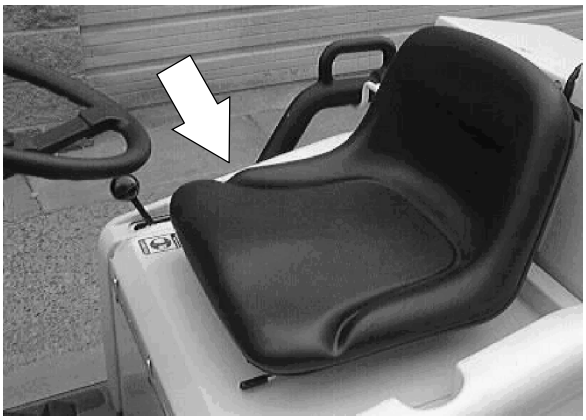


8. Disengage the prop rod and lower the seat support.

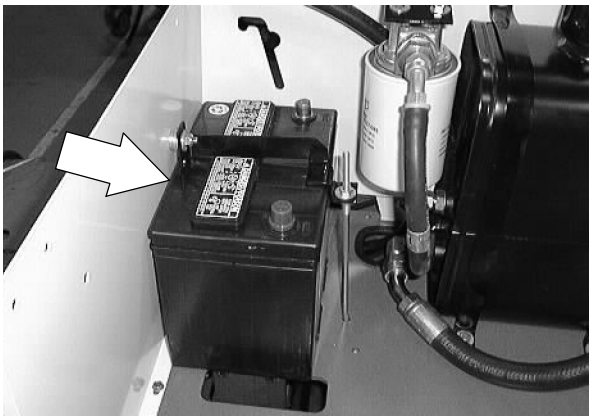
TO REPLACE BATTERY

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake, turn off machine, and remove key.

1. Open the seat support and engage the prop rod.

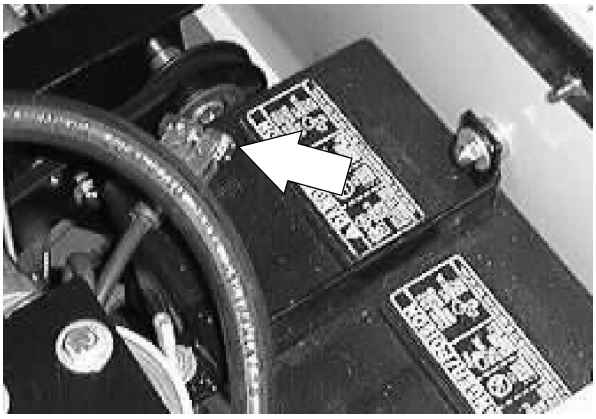


2. Locate the battery at the center of the machine, in front of the hydraulic tank.



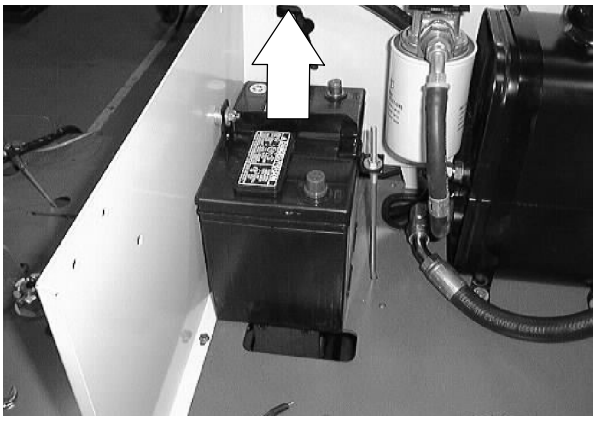
3. Remove the battery hold down bracket.

4. Remove the battery negative and positive cables.

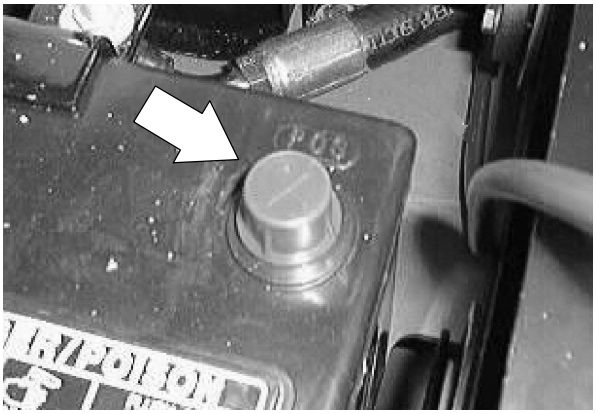


5. Lift the battery out of the machine.

6. Install the new battery in the machine in the same orientation as the old one.

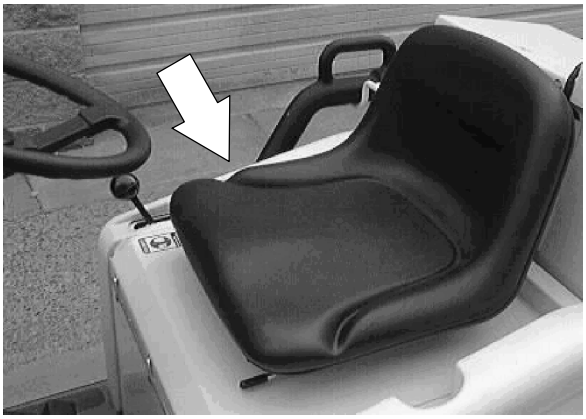


7. Reconnect the battery cables to the battery *(red cable to positive post, black cable to negative post)*



8. Reinstall the hold down bracket.

9. Disengage the prop rod and lower the seat support.



10. Check the new battery for proper operation. If battery needs charging, see TO CHARGE BATTERY instructions in this section.

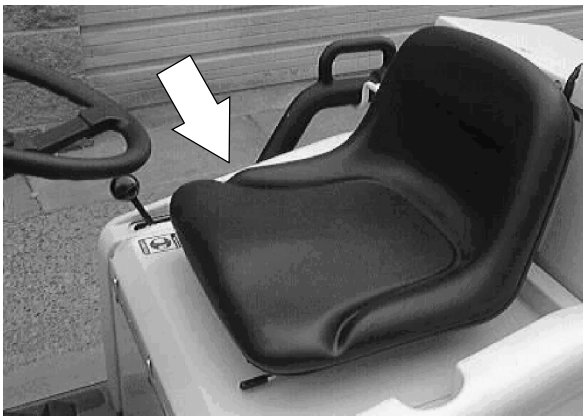
INSTRUMENT PANEL

The instrument panel on the model 6100G/LP contains the switches, gauges, and instruments needed to run the machine functions.

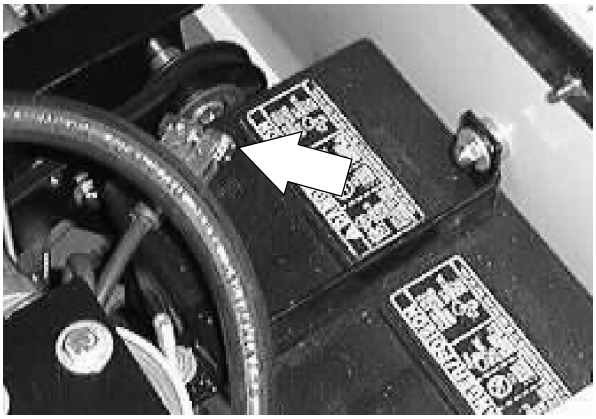
TO ACCESS INSTRUMENT PANEL

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake.

1. Open the seat support and engage the prop rod.

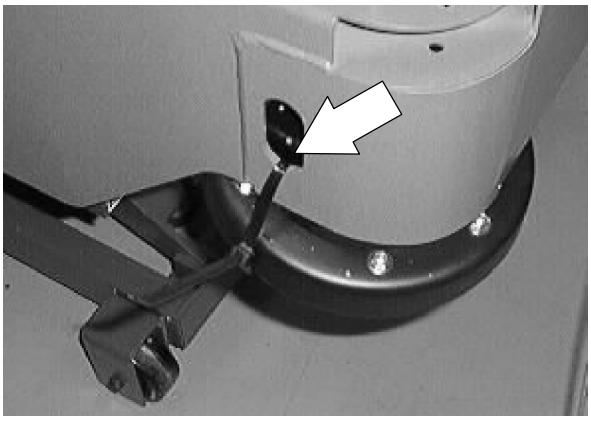


2. Disconnect the machine battery.

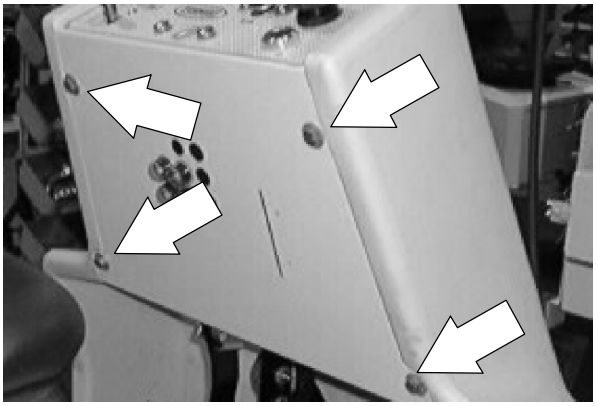


3. Disengage the prop rod and lower the seat support.

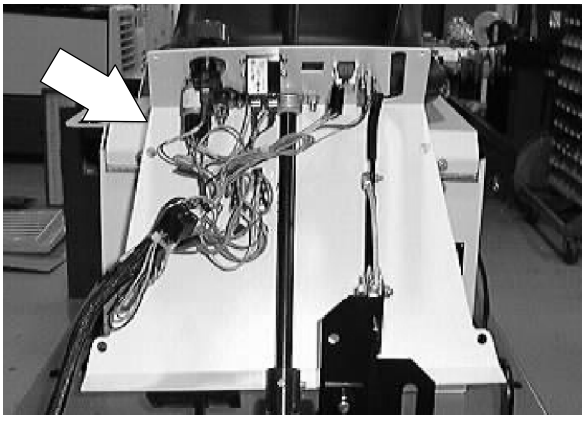
4. Tie the side brush in the up position.



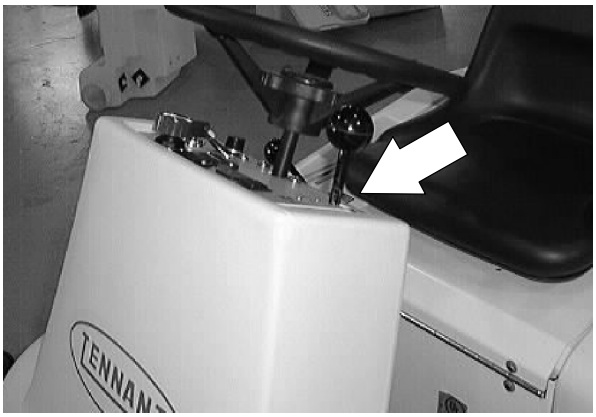
5. Remove the four hex screws and two pan screws holding the instrument panel to the front shroud.



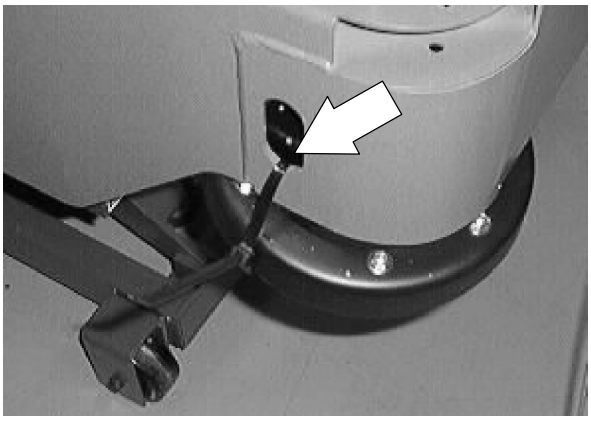
6. Pull the instrument panel back away from the front shroud for better access to the circuit breakers.



7. Position the instrument panel back onto the front shroud. Reinstall the hardware and hand tighten tight.

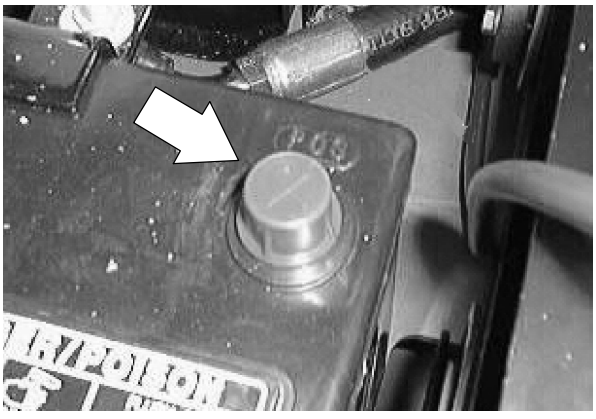


8. Remove the tie holding the side brush in the up position.



9. Open the seat support and engage the prop rod.

10. Reconnect the battery.



11. Disengage the prop rod and lower the seat support.

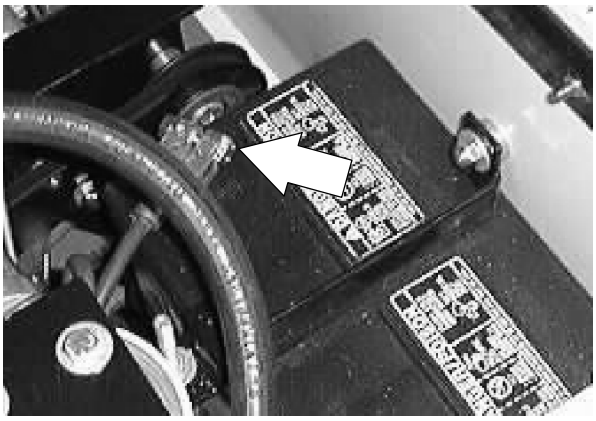
12. Start the machine and check for proper operation.

TO REPLACE INSTRUMENT PANEL CIRCUIT BREAKER

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake.

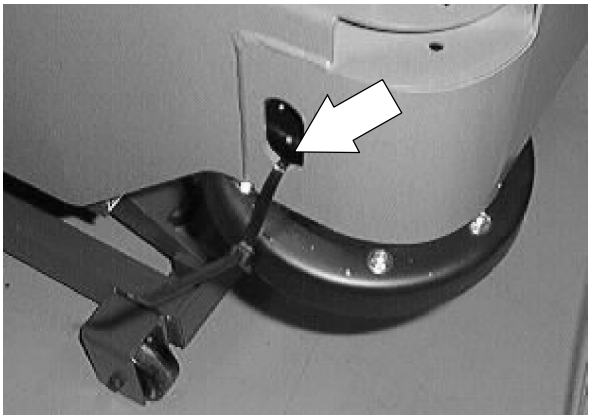
1. Open the seat support and engage the prop rod.

2. Disconnect the machine battery.

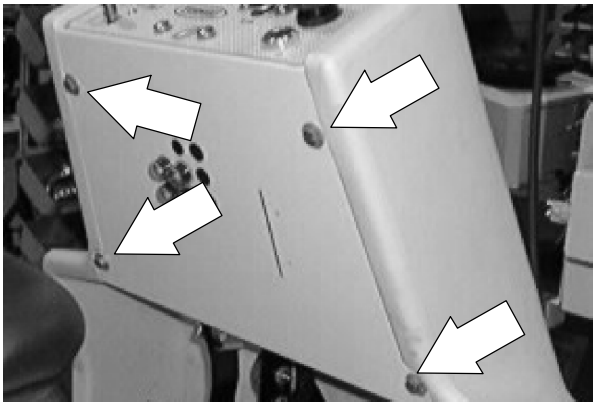


3. Disengage the prop rod and lower the seat support.

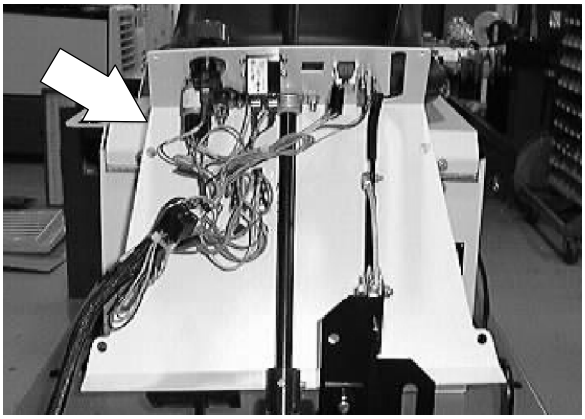
4. Tie the side brush in the up position.



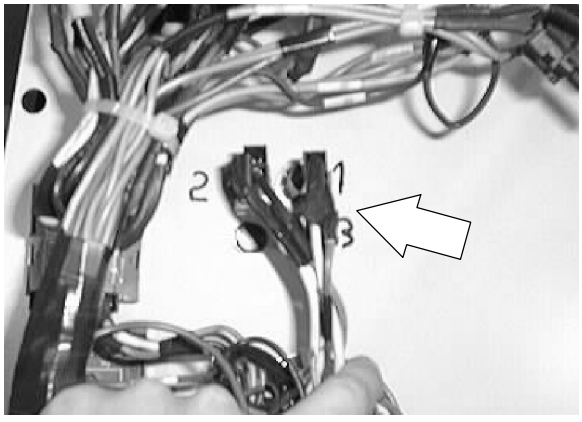
5. Remove the four hex screws and two pan screws holding the instrument panel to the front shroud.



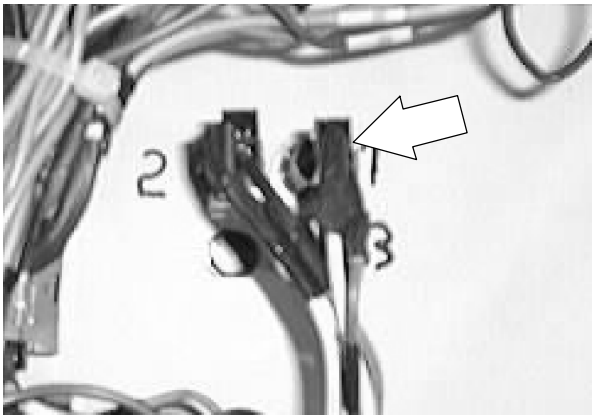
6. Pull the instrument panel back away from the front shroud for better access to the circuit breakers.



7. Locate the circuit breaker that needs to be changed.



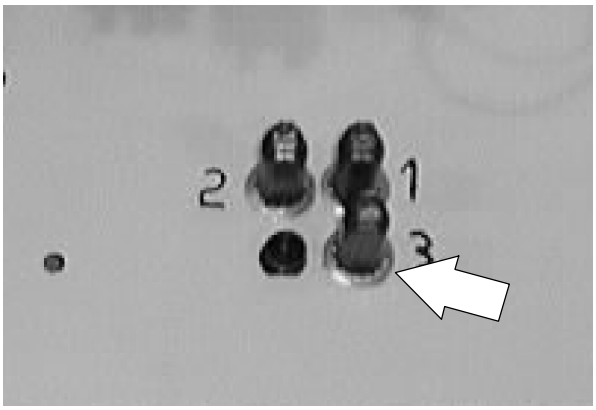
8. Mark and disconnect the wires leading to the back of the circuit breaker.



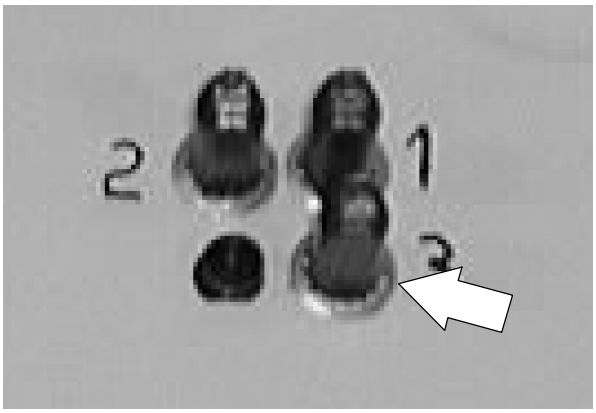
9. Remove the metal retainer ring from the back of the circuit breaker.

10. Push the circuit breaker out of the hole. Retain the clear, rubber boot and discard the circuit breaker.

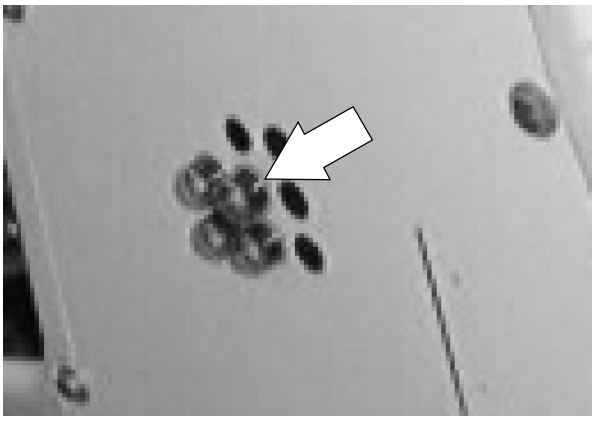
11. Position the new circuit breaker into the mount hole. *NOTE: The mount hole has a "D" shape to match the shape of the circuit breaker.*



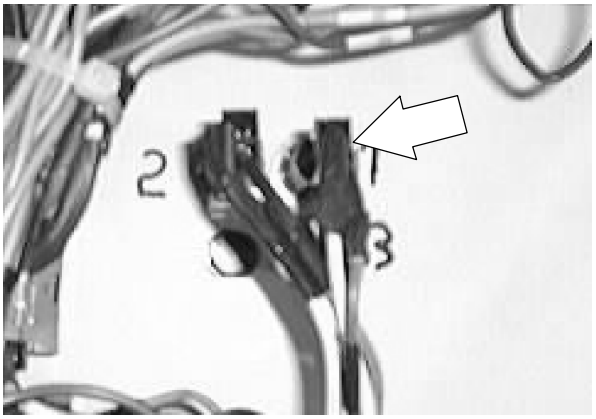
12. Install the metal retainer ring onto the back of the new circuit breaker. Push the retainer all the way down the circuit breaker.



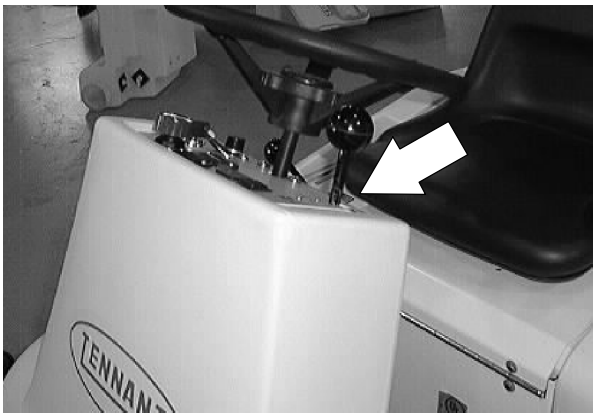
13. Install the rubber boot onto the out side of the new circuit breaker.



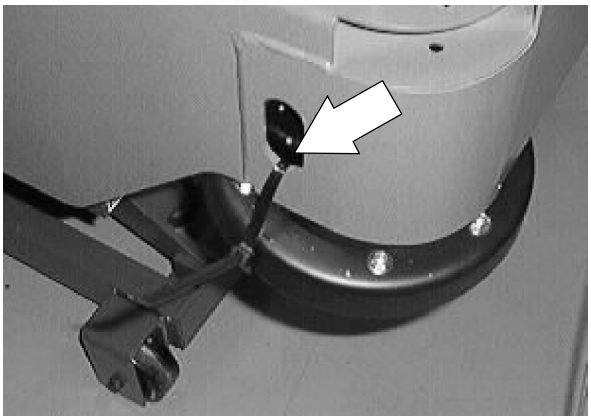
14. Reconnect the electrical wires to the new circuit breaker. See schematic in the ELECTRICAL section.



15. Position the instrument panel back onto the front shroud. Reinstall the hardware and hand tighten tight.

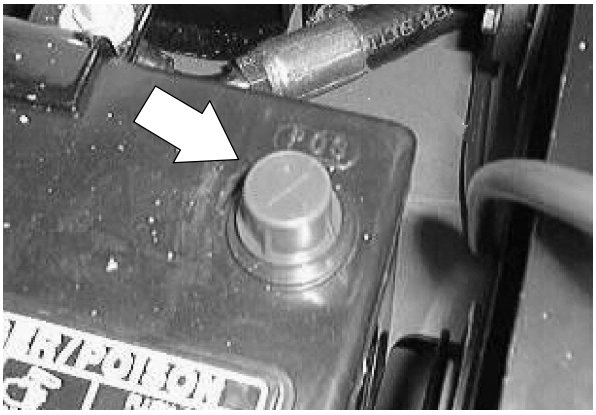


16. Remove the tie holding the side brush in the up position.

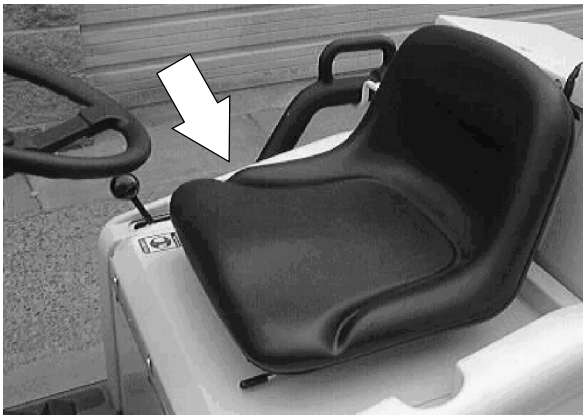


17. Open the seat support and engage the prop rod.

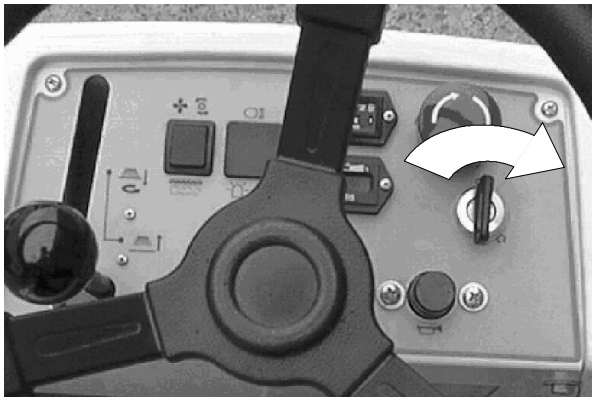
18. Reconnect the battery.



19. Disengage the prop rod and lower the seat support.



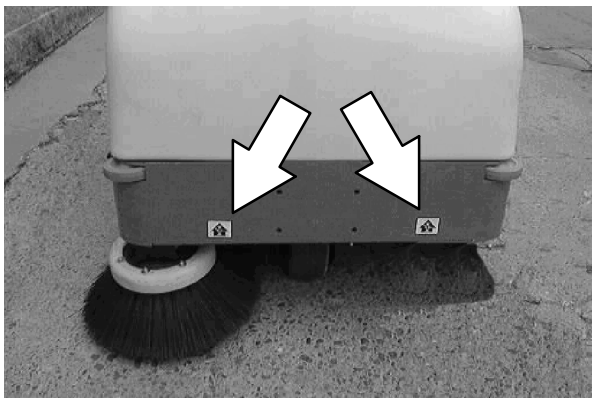
20. Start the machine and check for proper operation.



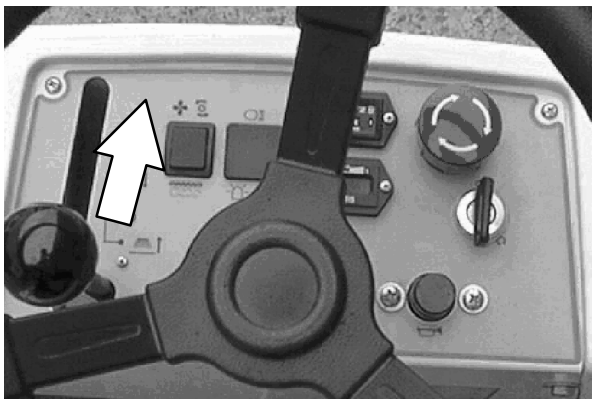
TO REPLACE SIDE BRUSH MOTOR

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake.

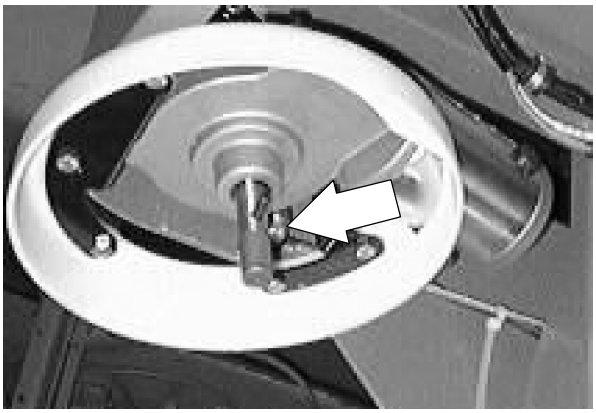
1. Jack up the front of the machine at the jack point. Install jack stands under the machine frame.



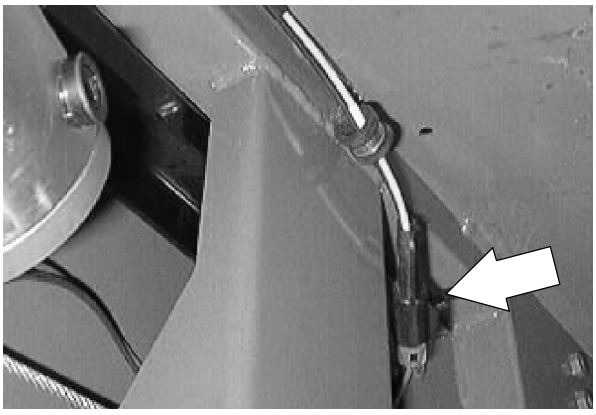
2. Lower the side brush.



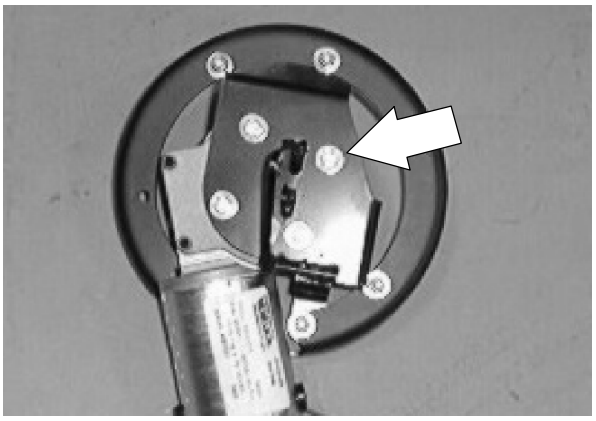
3. Remove the side brush from the motor assembly. See TO REPLACE SIDE BRUSH instructions in the SWEEPING section.



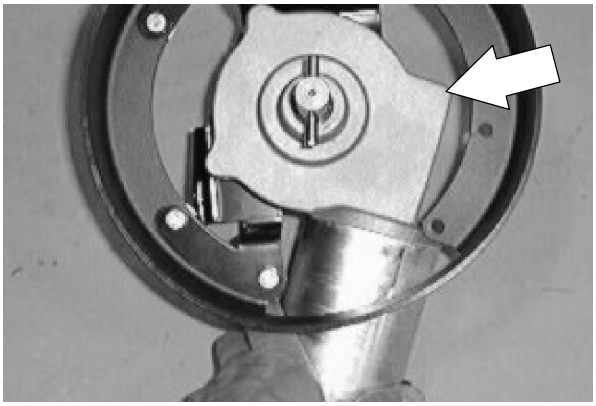
4. Disconnect the side brush motor from the main wire harness.



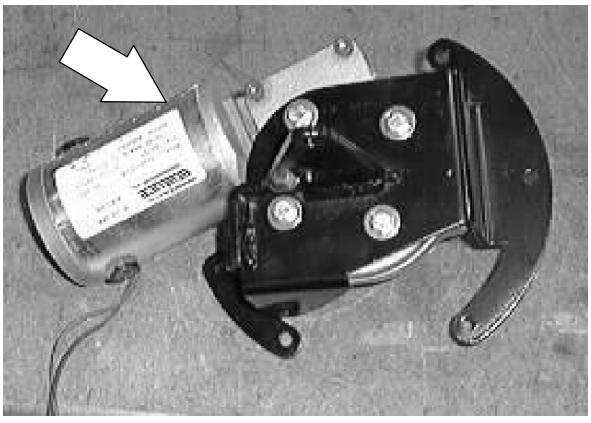
5. Remove the four hex screws holding the side brush motor to the motor mount bracket.



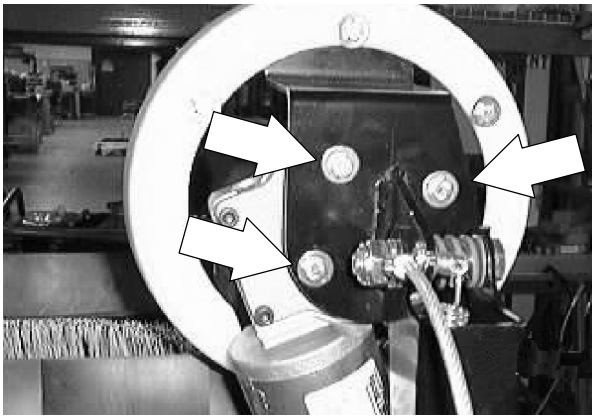
6. Drop the motor out of the mount bracket and past the brush guard.



7. Position the new side brush motor onto the motor mount bracket. The motor is positioned to the rear of the machine.

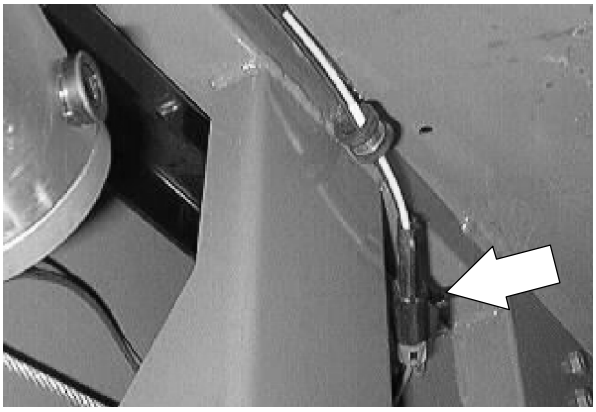


8. Line up the holes in the motor assembly with the mount holes in the motor bracket. Reinstall the four hex screws and tighten to 8 – 10 Nm (6 – 7 ft lb).



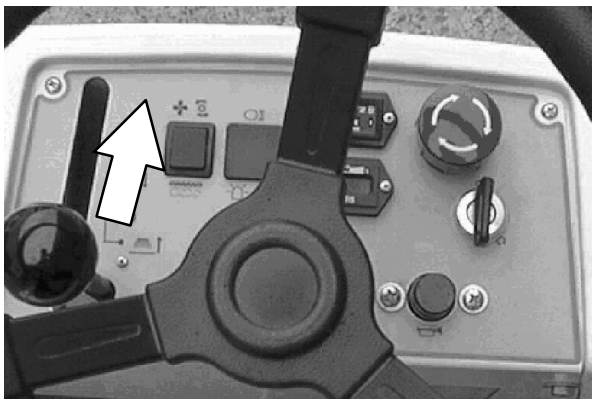
9. Reconnect the side brush motor to the main harness.

10. Wire tie the motor wires to the motor housing.



11. Reinstall the side brush. See TO REPLACE SIDE BRUSH instructions in the SWEEPING section.

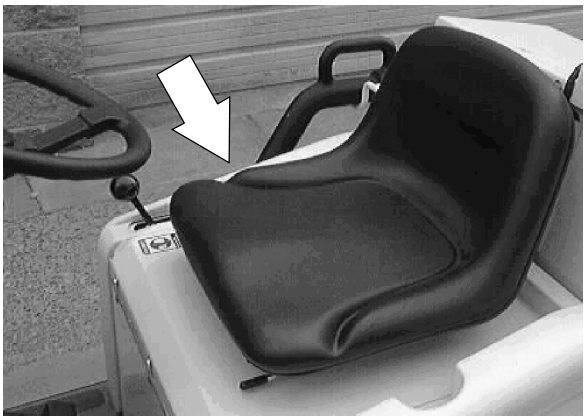
12. Operate the machine. Check the side brush for proper operation.



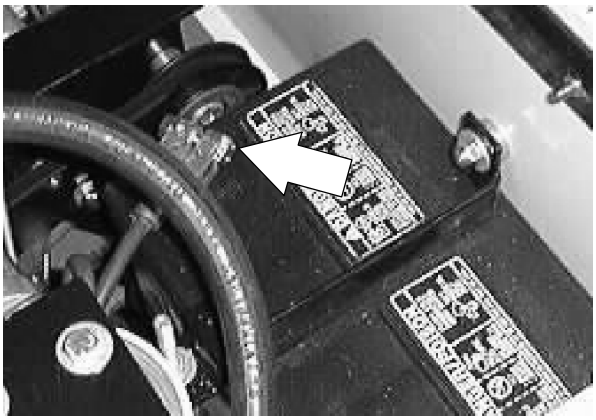
TO REPLACE ENGINE STARTER

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake, Turn Off Machine And Remove Key.

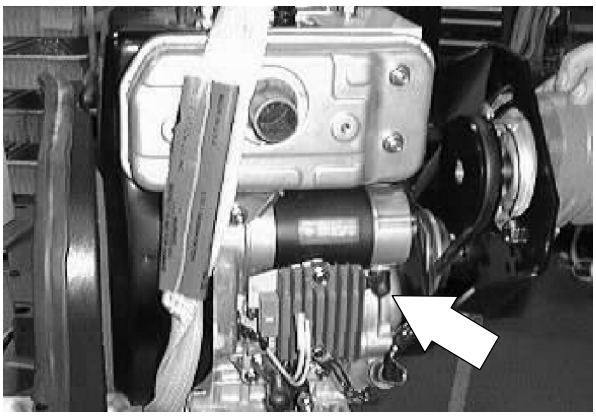
1. Tilt the seat assembly forward and engage the prop rod.



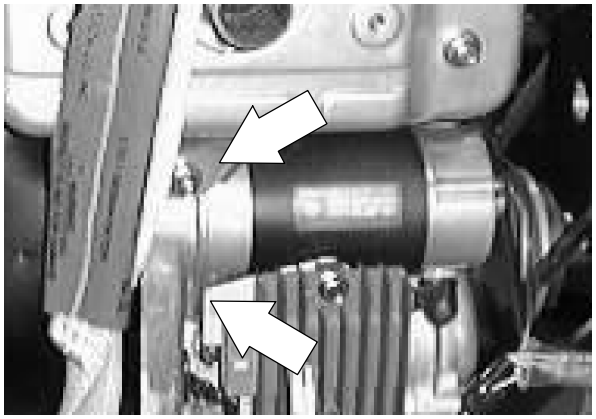
2. Disconnect the battery cables from the battery.



3. Disconnect the wires from the starter motor.

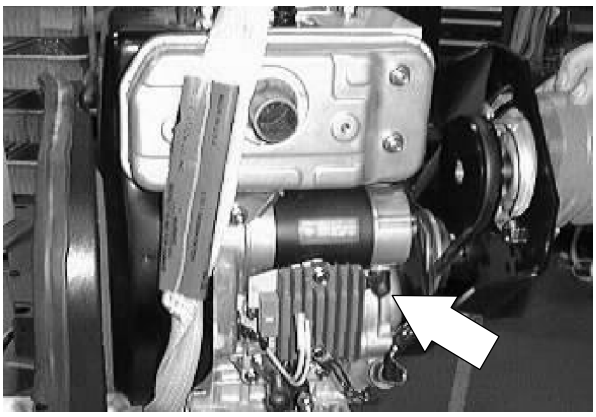


4. Remove the two hex nuts holding the starter to the engine. Remove the starter from the flywheel housing and out of the machine.

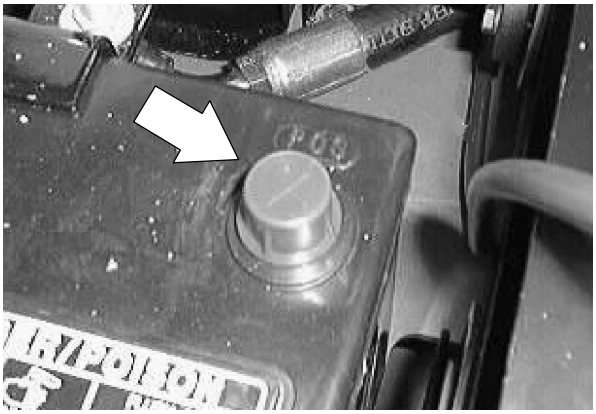


5. Position the new starter back in the flywheel housing. Re-use the two hex nuts and tighten to 18 – 24 Nm (15 – 20 ft lb).

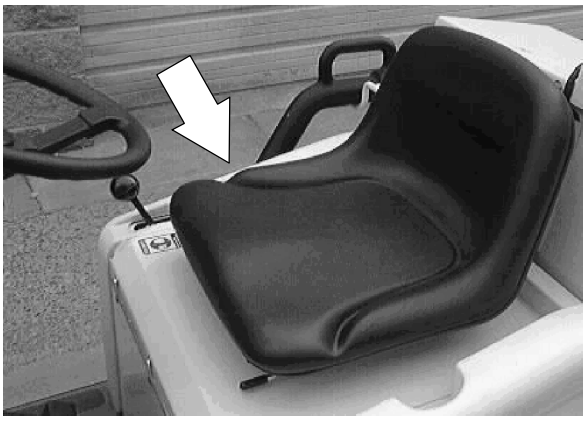
6. Reconnect the electrical wires to the starter. See schematic in this section.



7. Reconnect the battery cables to the battery and check the starter for proper operation.

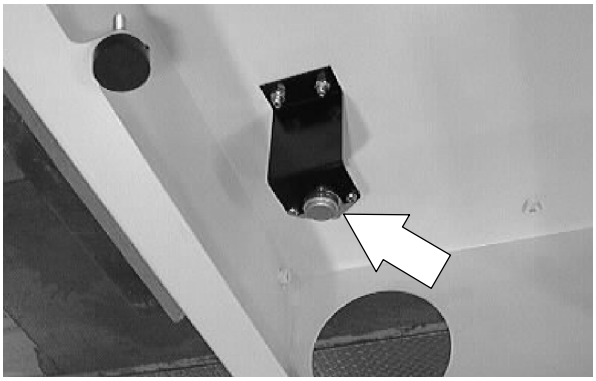


8. Disengage the seat prop rod and pivot the seat assembly down. Check the new starter for proper operation.

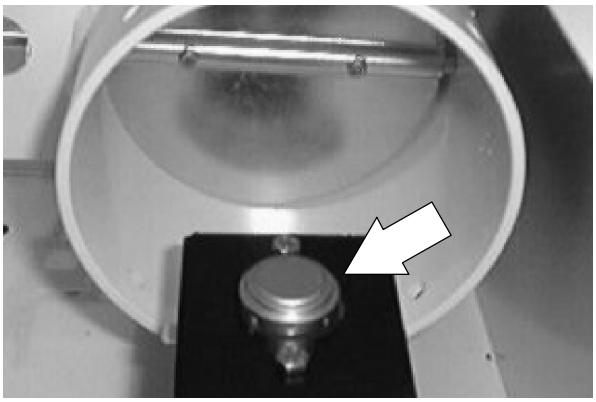


THERMO SENTRY™

The Thermo Sentry™ is located in the dust filter area. If the Thermo Sentry™ will senses a fire in the filter area, the vacuum shut-off solenoid will close, shutting down the airflow.

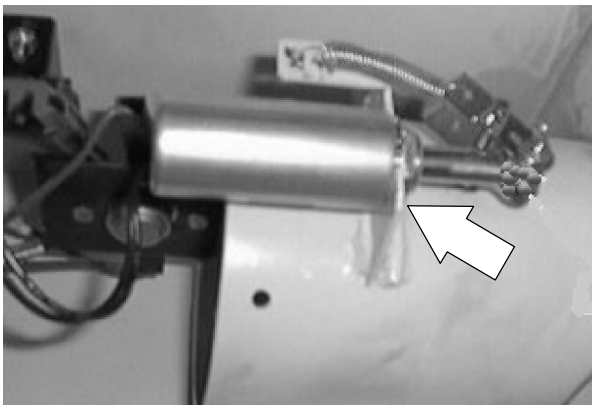


Access the Thermo Sentry™ by dropping the dust filter down.

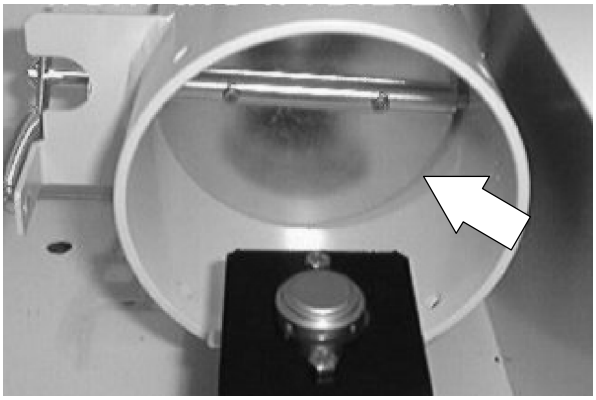


VACUUM FAN SHUTOFF SOLENOID

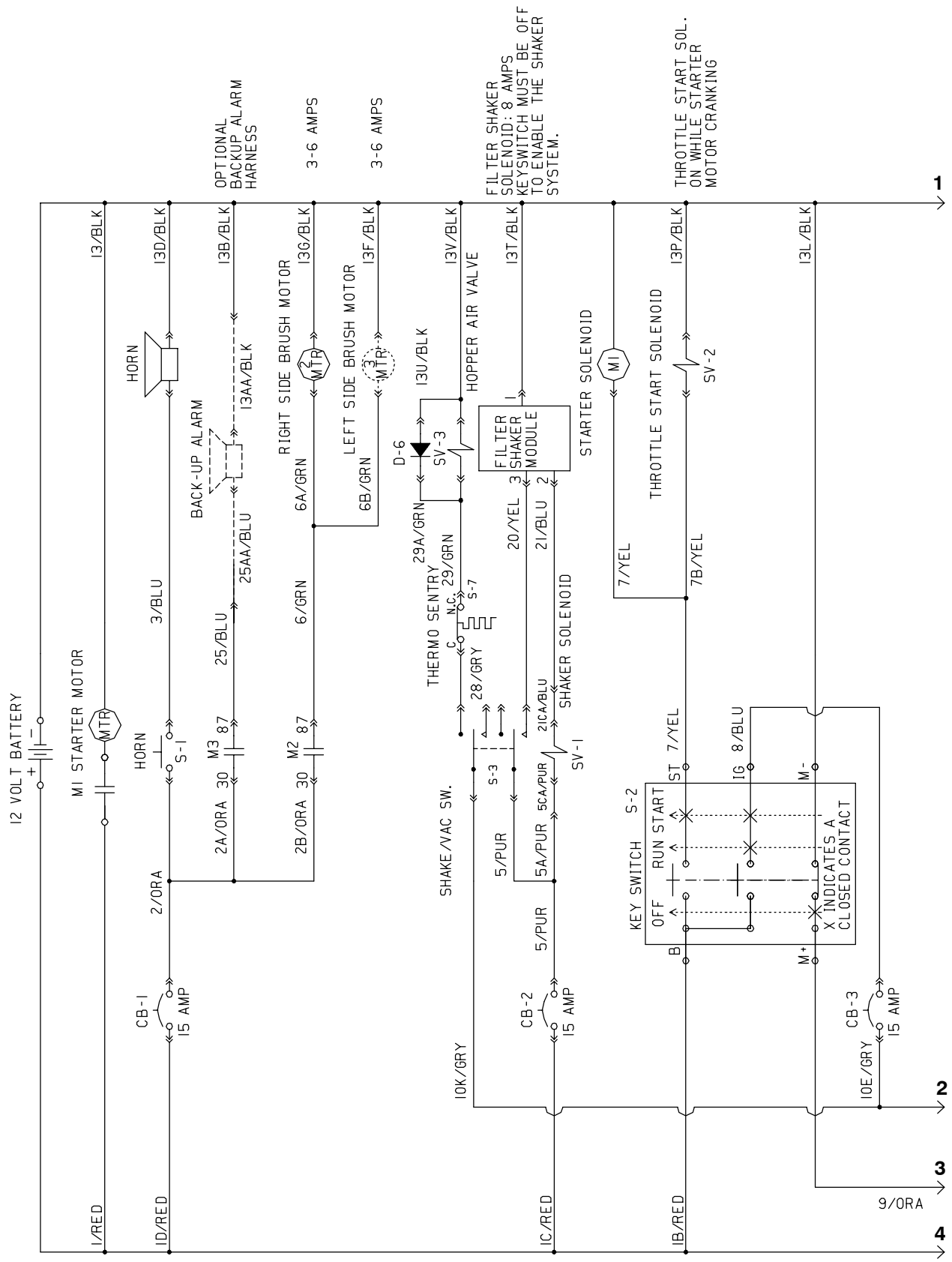
The vacuum fan shutoff solenoid is located in the dust filter area. If the Thermo Sentry will senses a fire in the filter area, the vacuum shut-off solenoid will close, shutting down the airflow.



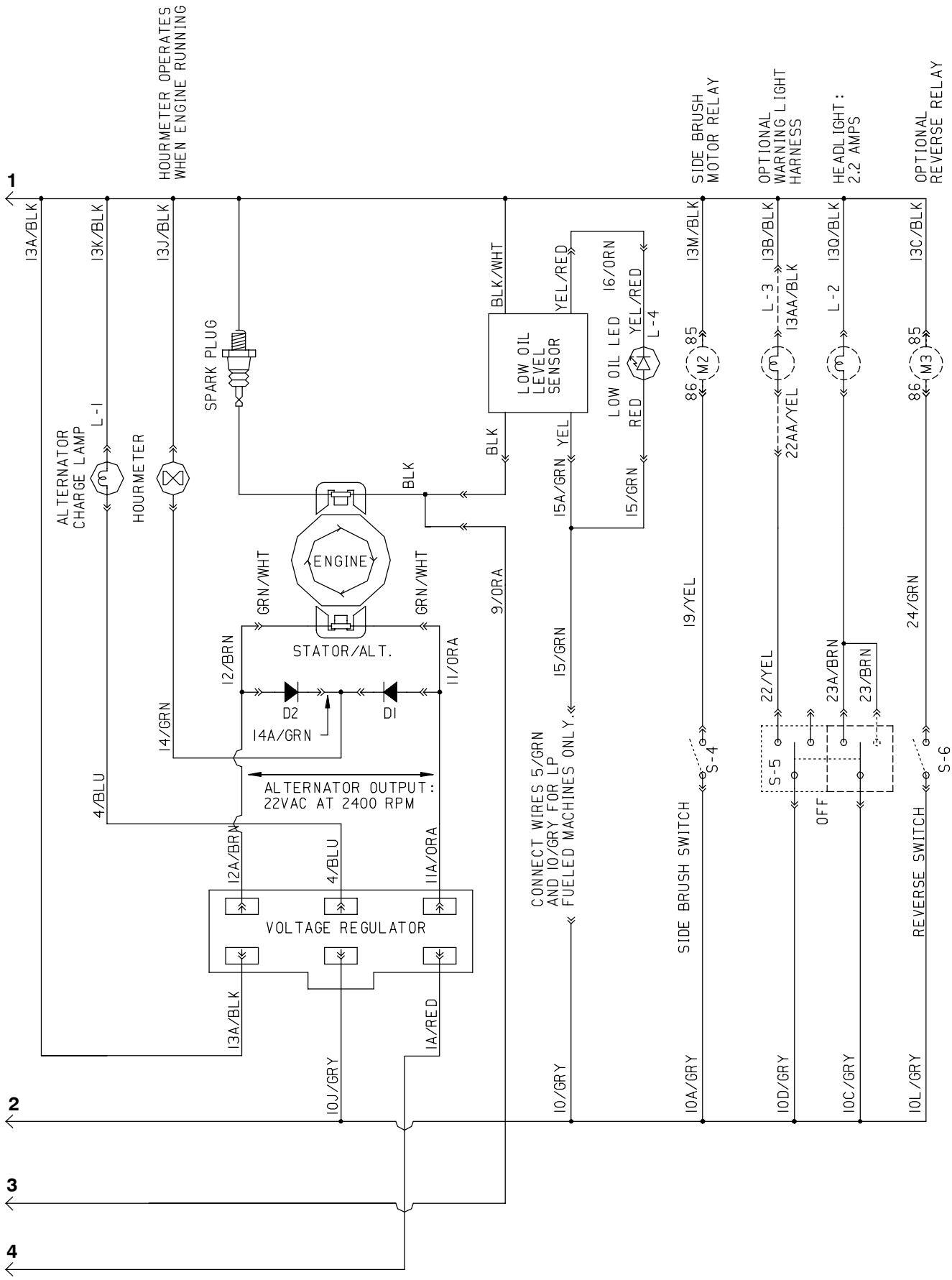
Access the shutoff solenoid by dropping the dust filter down.



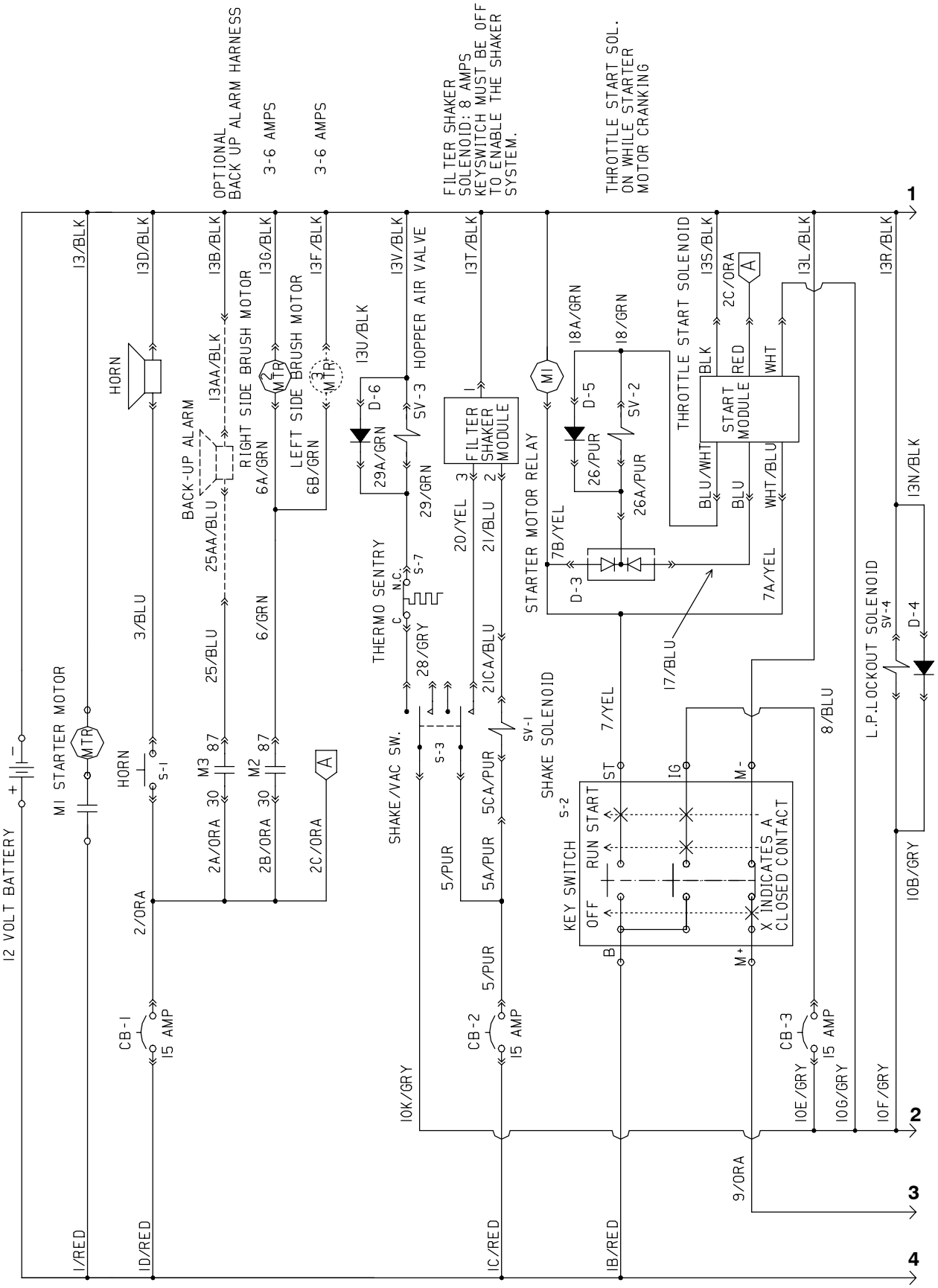
ELECTRICAL SCHEMATIC GAS



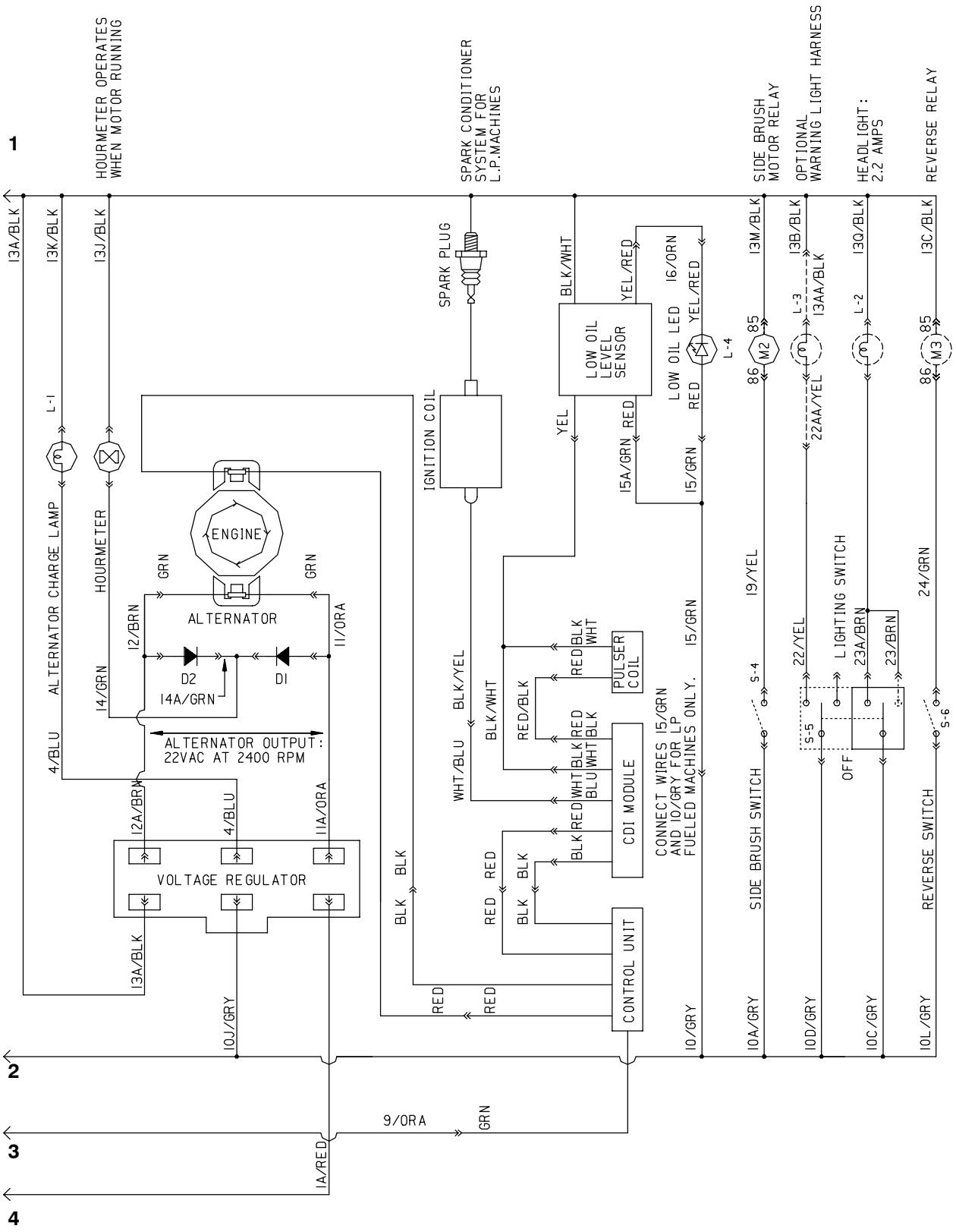
ELECTRICAL SCHEMATIC GAS



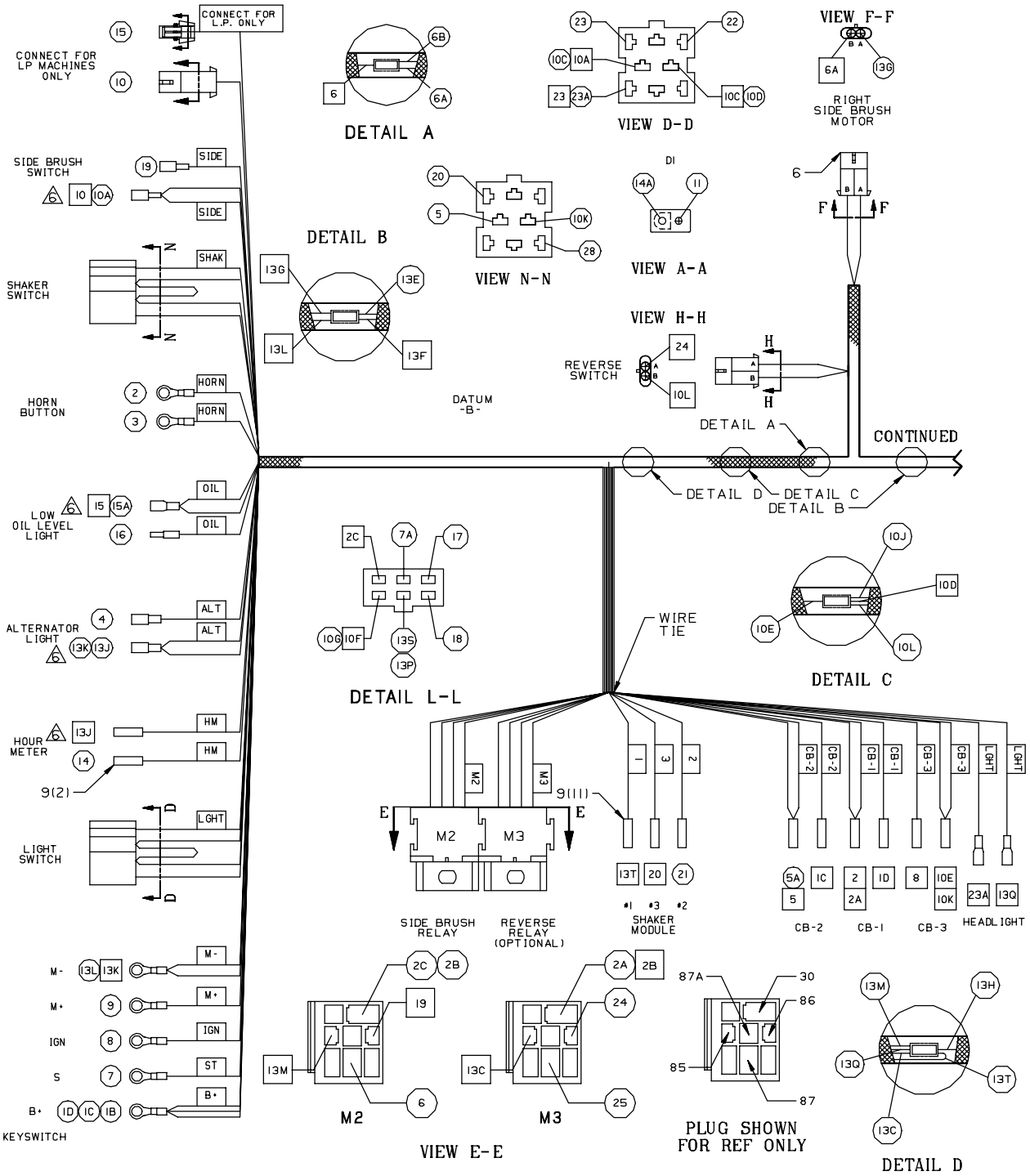
ELECTRICAL SCHEMATIC LP



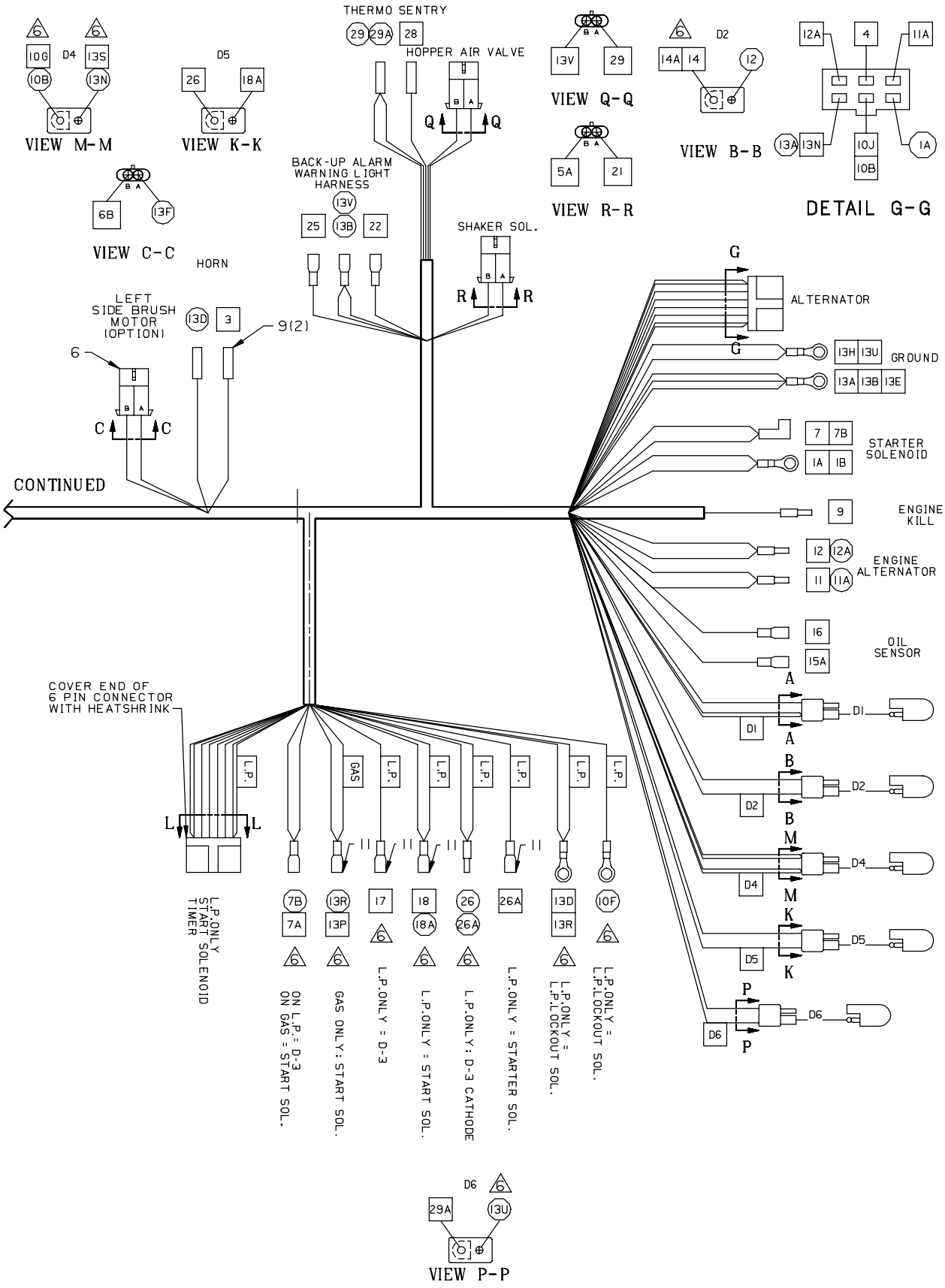
ELECTRICAL SCHEMATIC LP



WIRE DIAGRAM GAS/LP



WIRE DIAGRAM GAS/LP



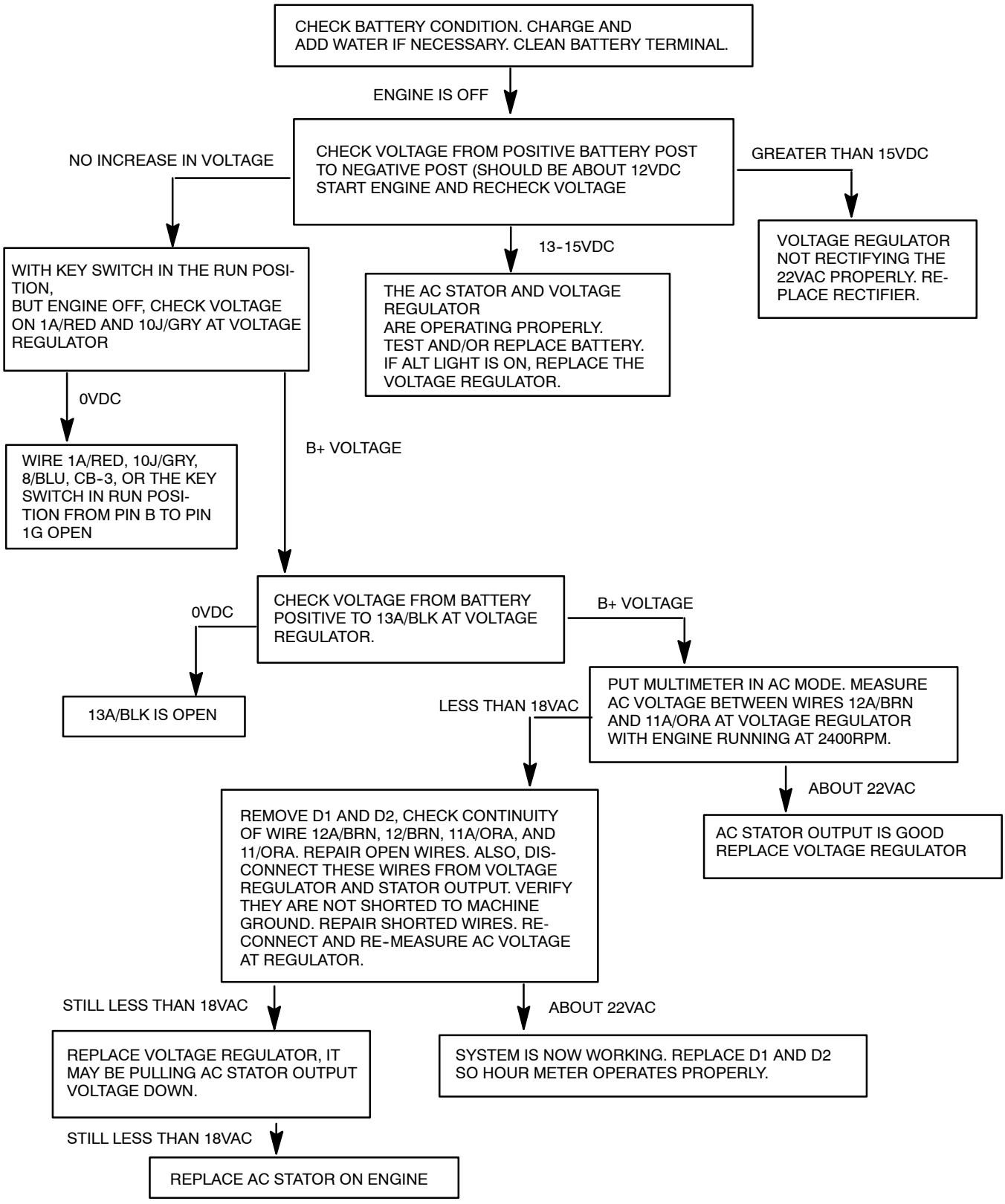
TROUBLESHOOTING

The troubleshooting charts that follow are organized so they lead you through the circuits. They include flow charts and instructions for you as to where to insert your test instruments.

BATTERY NOT CHARGING (ALTERNATOR LIGHT IS ON)

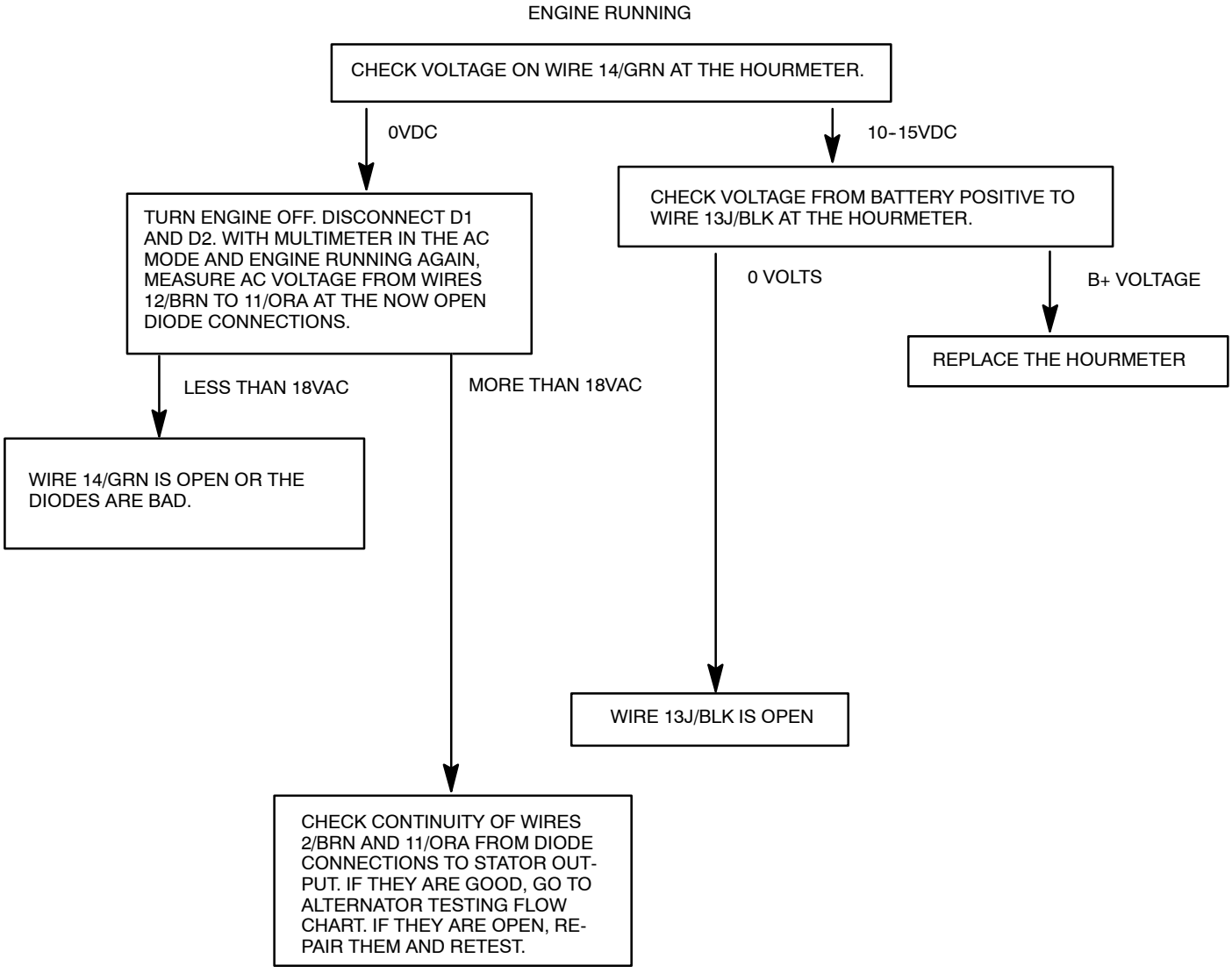
NORMAL OPERATION:

1. Engine stator puts out 22 VAC at 2400 rpm.
2. The voltage regulator rectifies 22 VAC down to 13-15 VDC.
3. The 13-15 VDC output from the voltage regulator charges the battery.



HOUR METER IS NOT OPERATING WITH ENGINE RUNNING

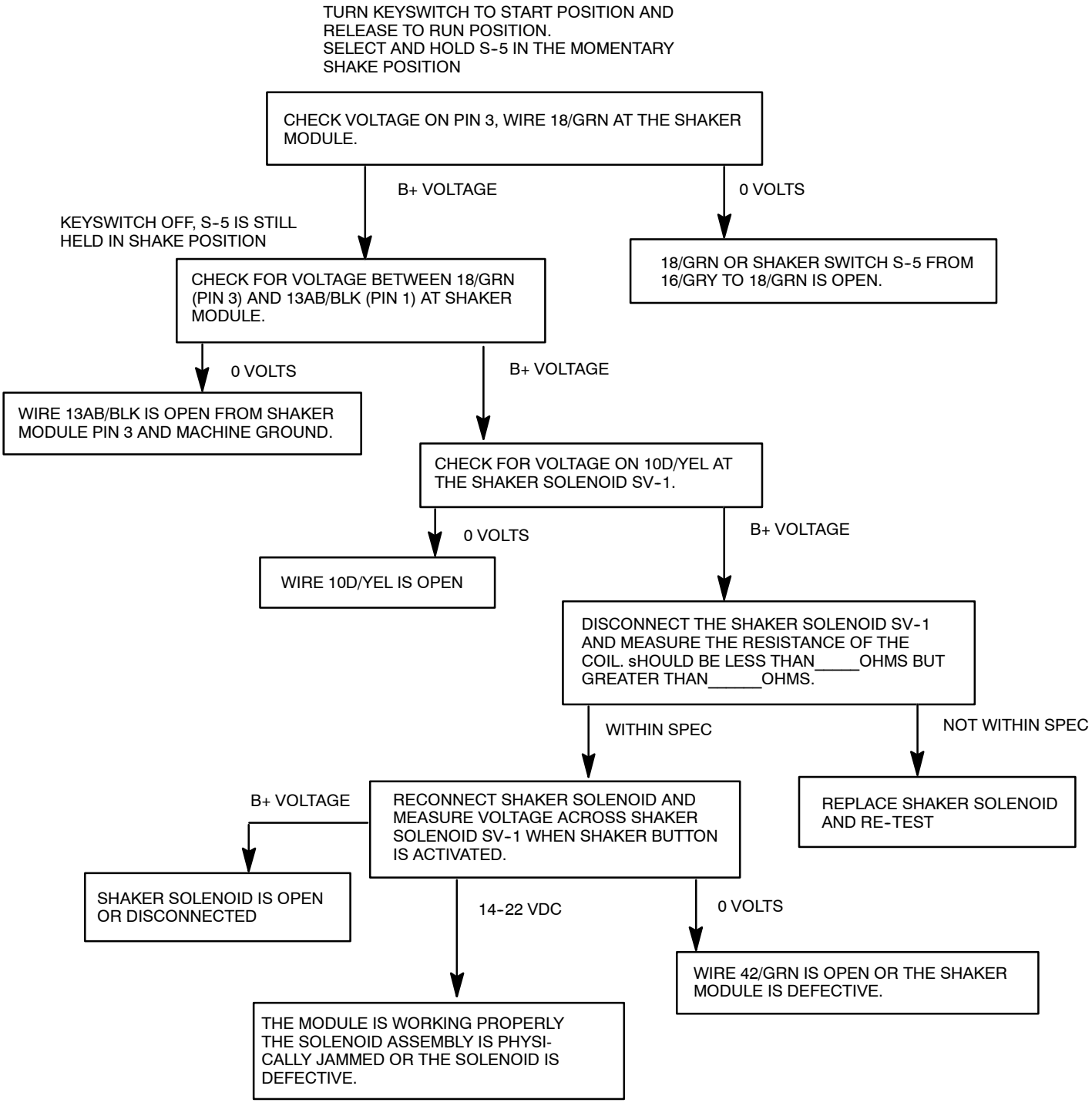
NORMAL OPERATION:
1. Engine stator puts out 22 VAC at 2400 rpm.
2. Diodes D1 and D2 rectify 22 VAC down to 13-15 VDC.
3. The 10-15 VDC output from D1 and D2 powers up the hour meter.



SHAKE SYSTEM NOT OPERATING

NORMAL OPERATION:

1. With the keyswitch off, the operator selects shake by activating and holding switch S-5 on the front panel.
2. B+ voltage is supplied to pin 3 of the shaker module, turning on the shaker module..
3. Pin 2 of the shaker module is pulsed to ground (pin 1).
4. The shaker solenoid is turned on and off at a high frequency, moving the filter bar back and forth.

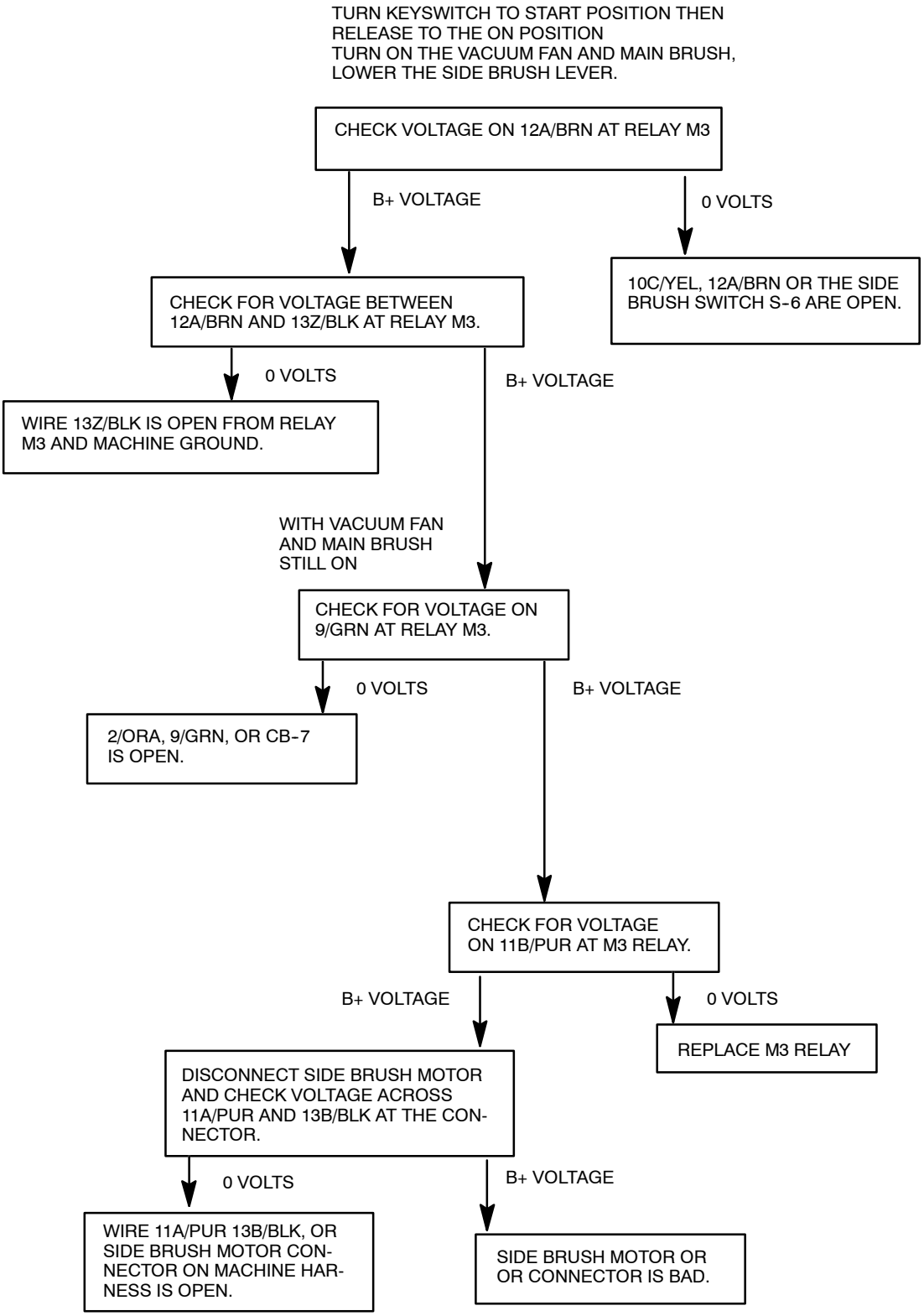


NOTE: IF THE SHAKER SYSTEM WORKS FOR A SHORT DURATION, THEN STOPS OR SLOWS, THE SHAKER COIL IS DRAWING EXCESSIVE CURRENT. REPLACE THE SHAKER COIL.

SIDE BRUSH IS NOT OPERATING

NORMAL OPERATION:

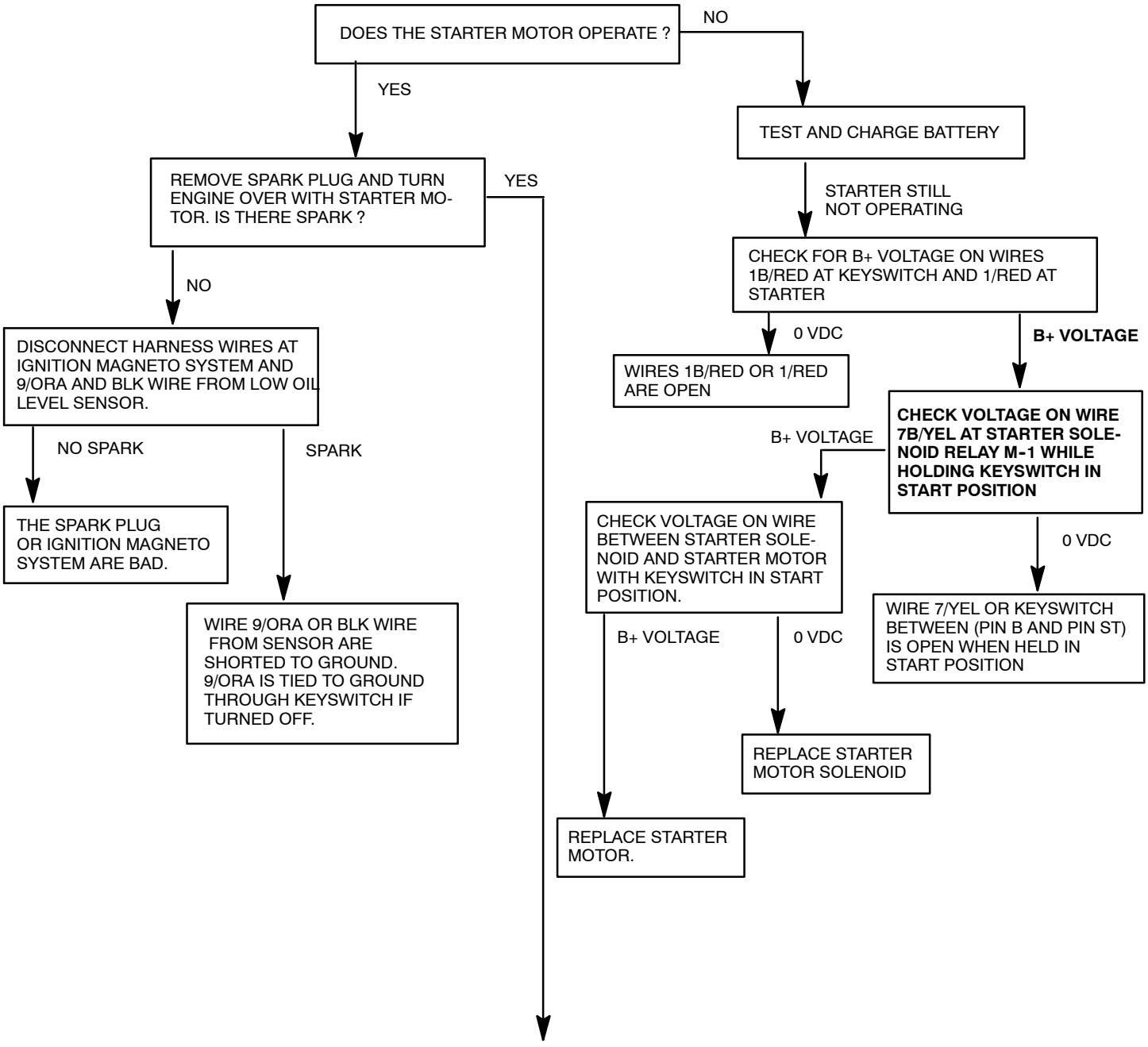
1. **With vacuum fan and brush on, lowering the side brush lever will activate limit switch S-6, and turn on relay M3.**
2. **Relay M3 supplies power to the side brush motors.**



ENGINE WILL NOT START

NORMAL OPERATION:

1. **Key switch is cycled to the start position.**
2. **B+ voltage is supplied to the starter motor relay M1 and the start module with associated solenoid.**
3. **The starter motor turns the engine, start module activates the start solenoid to achieve full throttle, and magneto ignition system creates spark at the spark plug.**
4. **The key switch is returned to the run position, and the starter motor is shut off once the engine starts.**



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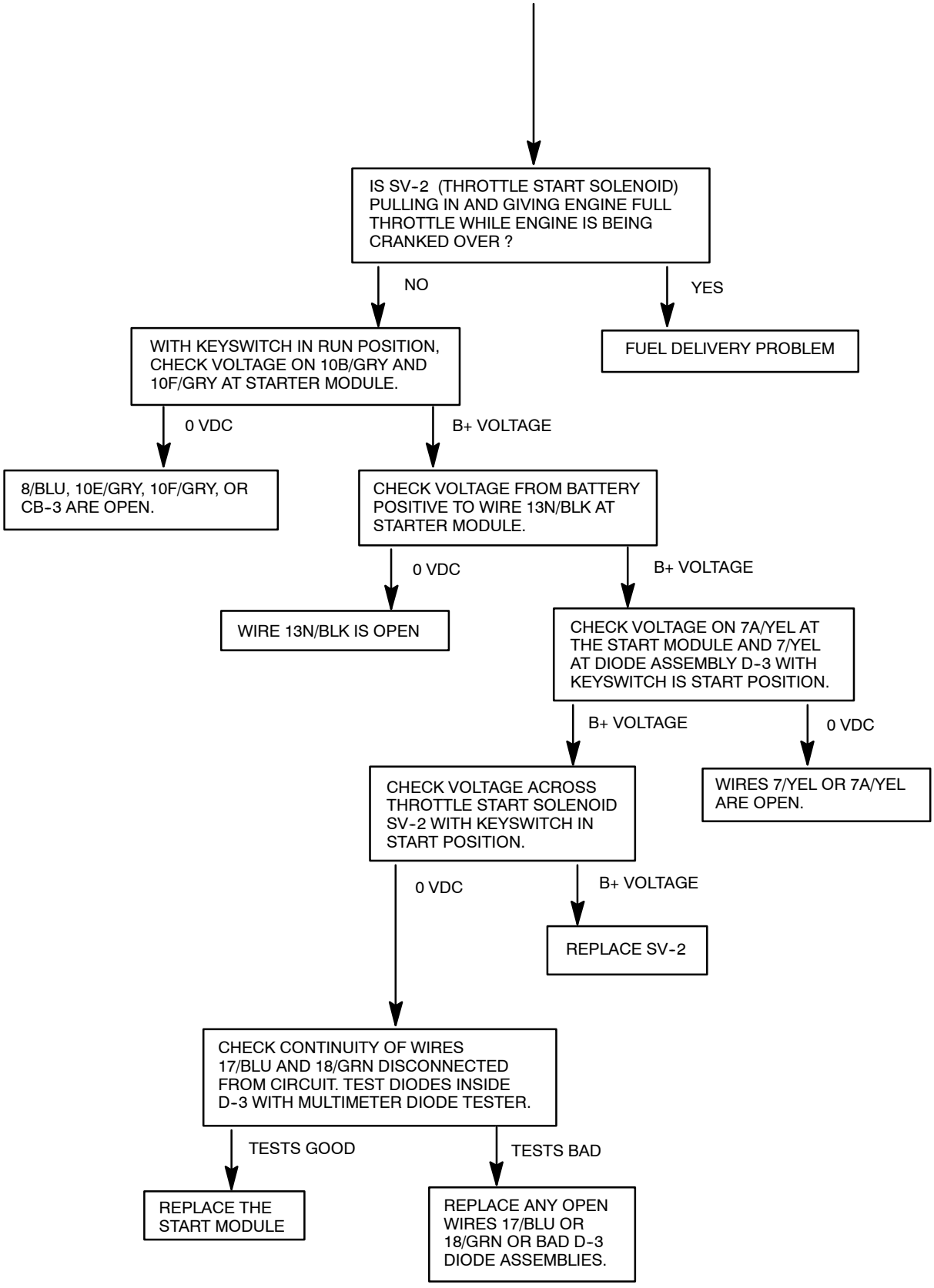


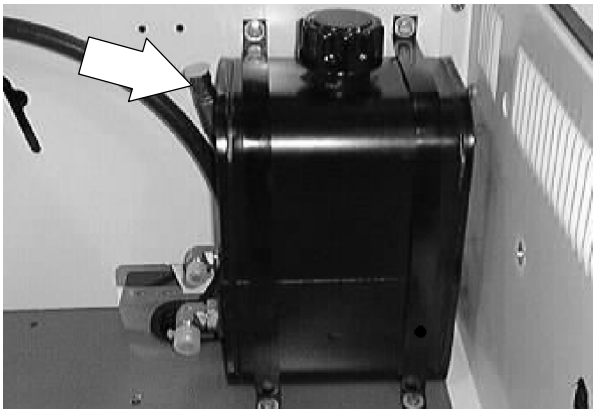
CONTENTS

INTRODUCTION

The hydraulic system on the model 6100G/LP consists of the hydraulic pump, directional control valve, and drive motor.

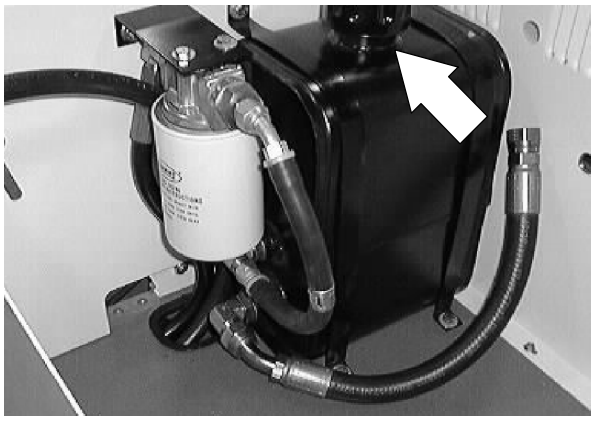
HYDRAULIC FLUID RESERVOIR

The reservoir is located on the right side of the machine next to the engine.



A filler cap is mounted on top of the reservoir. It has a built in breather and fluid level dipstick. Replace the cap after every 800 hours of operation.

Check the hydraulic fluid level at *operating temperature* daily. The dipstick is marked with full and add markings to indicate the level of hydraulic fluid in the reservoir. Cold fluid level is mid-point of add and full lines.

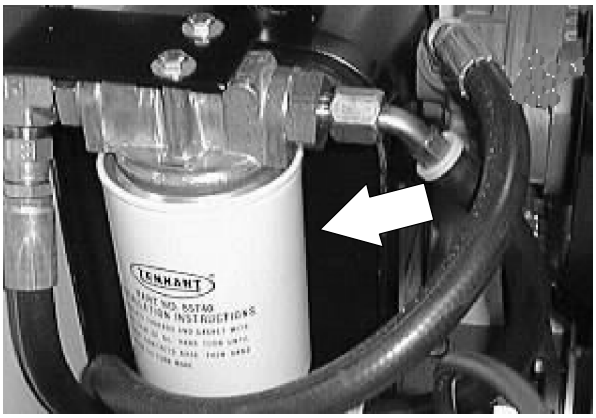


Lubricate the filler cap gasket with a film of hydraulic fluid before putting the cap back on the reservoir.

ATTENTION! Do not overfill the hydraulic fluid reservoir or operate the machine with a low level of hydraulic fluid in the reservoir. Damage to the machine hydraulic system may result.

Drain and refill the hydraulic fluid reservoir with new hydraulic fluid every 800 hours of operation.

NOTE: When the hydraulic filter bypass light (optional) comes on, replace the filter, and change the hydraulic fluid as soon as possible.



The hydraulic fluid filter is located in front of the hydraulic reservoir near the rear of the engine compartment. Replace the filter element every 800 hours of operation.

HYDRAULIC FLUID

The quality and condition of the hydraulic fluid plays a very important role in how well the machine operates. TENNANT's hydraulic fluid is specially selected to meet the needs of TENNANT machines.

TENNANT's hydraulic fluid provides a longer life for the hydraulic components.

TENNANT part no.	Ambient Temperature
65870	below 7° C (45° F)

If a locally-available hydraulic fluid is used, make sure the specifications match TENNANT hydraulic fluid specifications. Using substitute fluids can cause premature failure of hydraulic components.

ATTENTION! Hydraulic components depend on system hydraulic fluid for internal lubrication. Malfunctions, accelerated wear, and damage will result if dirt or other contaminants enter the hydraulic system.

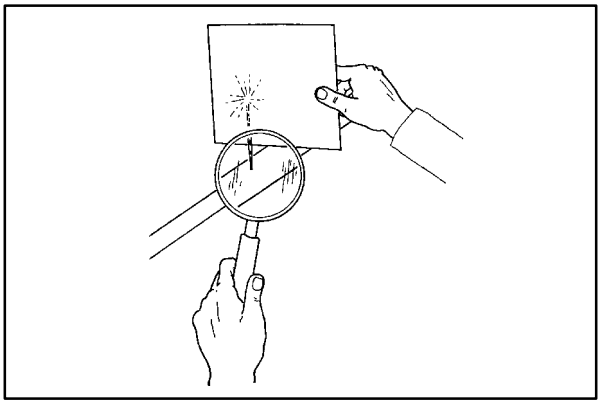
HYDRAULIC HOSES

Check the hydraulic hoses every 200 hours of operation for wear or damage.

Fluid escaping at high pressure from a very small hole can be almost invisible, and can cause serious injuries.

See a doctor at once if injury results from escaping hydraulic fluid. Serious infection or reaction can develop if proper medical treatment is not given immediately.

FOR SAFETY: When Servicing Machine, Use Cardboard To Locate Leaking Hydraulic Fluid Under Pressure.



If you discover a fluid leak, contact your mechanic/supervisor.

HYDRAULIC FLUID FILTER

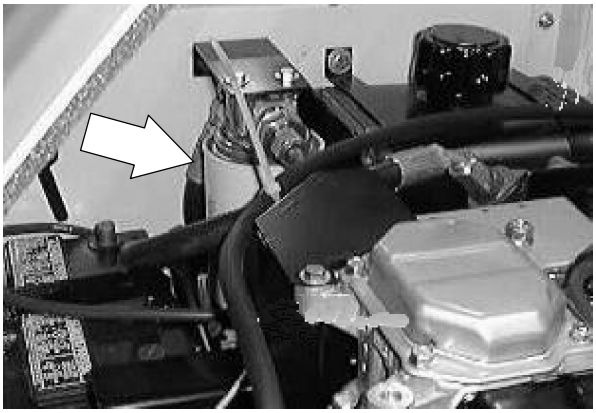
The hydraulic fluid filter is located at the front of the hydraulic tank. The filter is used to keep the fluid free from contaminates. The filter should be changed every 800 hours.

TO REPLACE HYDRAULIC FLUID FILTER

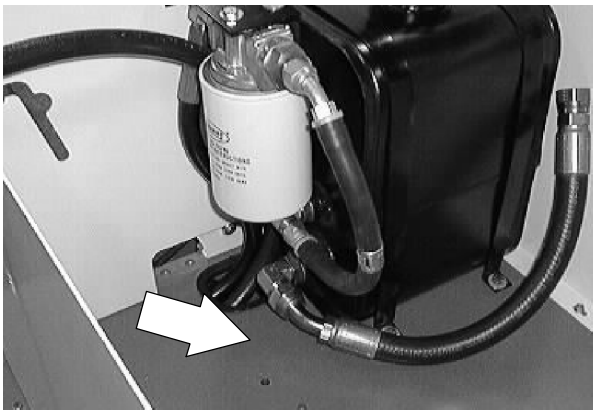
FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake, turn off machine, and remove key.

1. Open the seat support and engage the prop rod.

2. Locate the hydraulic fluid filter in front of the hydraulic tank.



3. Place a small drip pan or rag under the filter.



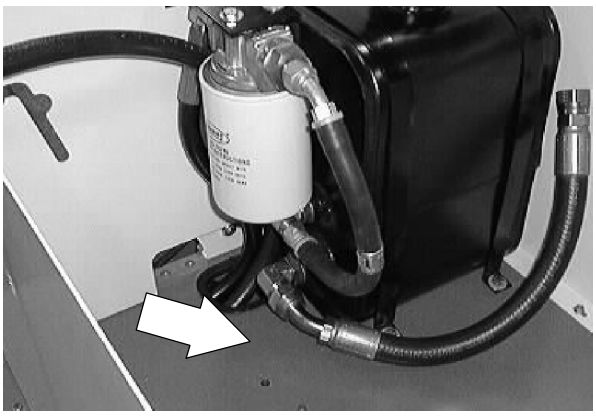
4. Un-screw the filter from the filter head. Properly discard the old filter.

5. Place a small amount of hydraulic oil on the rubber O-ring on the new filter.

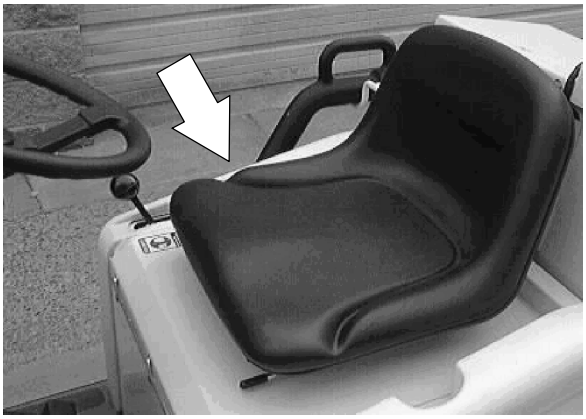
6. Screw the new filter onto the filter head. Tighten until snug then 1/4 turn.

7. Remove the drain pan or rag.

8. Start the machine and check the new hydraulic fluid filter for any leaks.

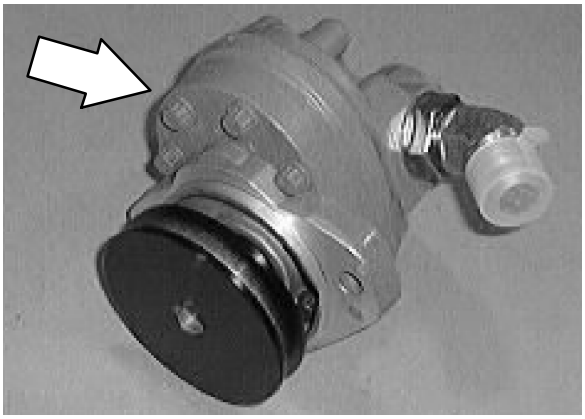


9. Disengage the prop rod and close the seat support.



HYDRAULIC PUMP

The hydraulic pump is driven off the engine and provides hydraulic flow to the control valve and drive motor.



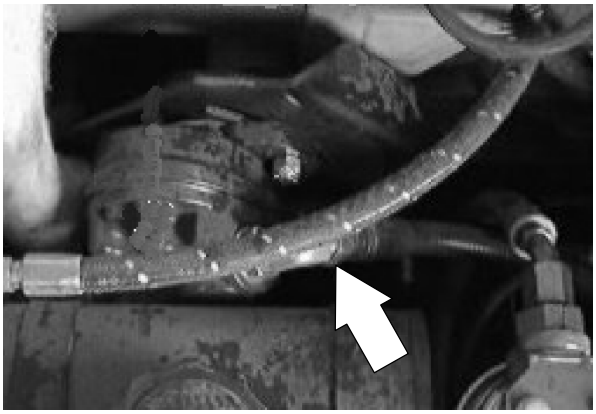
TO REPLACE HYDRAULIC PUMP

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake, Turn Off Machine And Remove Key.

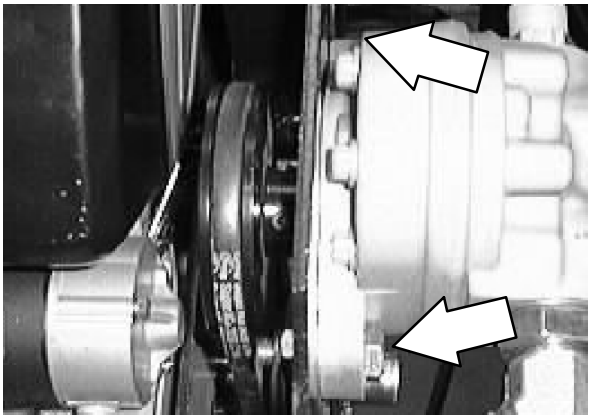
1. Tilt the seat assembly forward and engage the prop rod. Disconnect the battery cables from the battery.

2. Mark, disconnect, and plug the two hoses leading to the hydraulic pump.

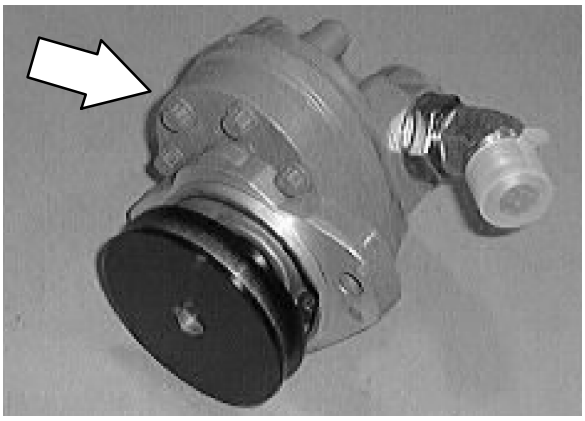
NOTE: Observe hydraulic cleanliness requirements when opening hydraulic lines.



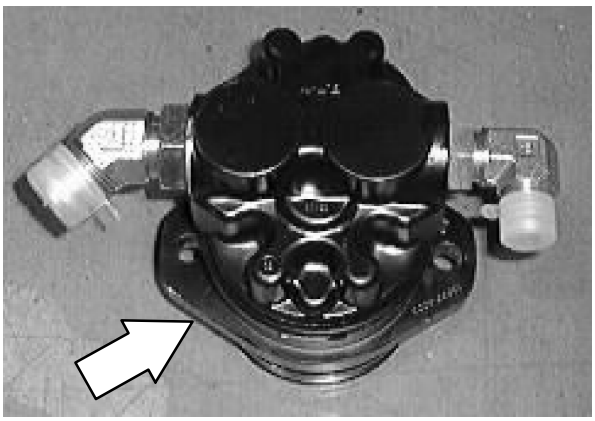
3. Loosen the bolts holding the hydraulic pump to the mount plate. Push the pump to loosen the V-belt. Remove the V-belt from the pump sheave.



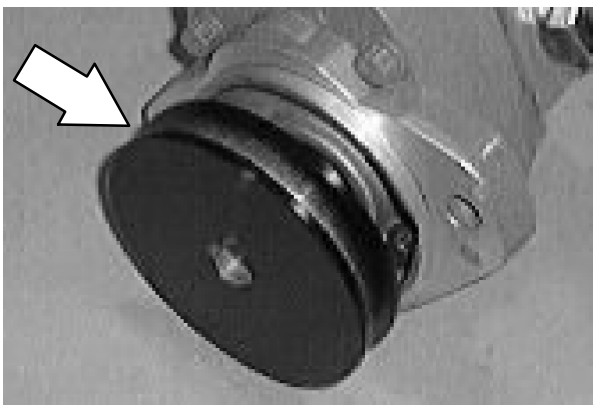
4. Remove the bolts and hydraulic pump from the machine.



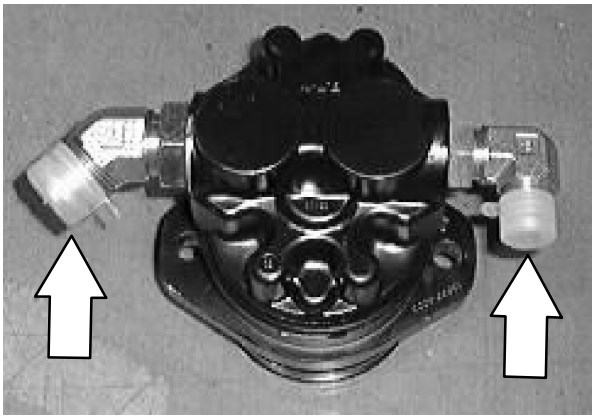
5. Loosen the two set screws holding the V-belt sheave to the pump shaft. Remove the sheave from the old hydraulic pump.



6. Install the V-belt sheave onto the shaft of the new hydraulic pump in the same orientation that it was removed. *Leave the set screws loose for now.*

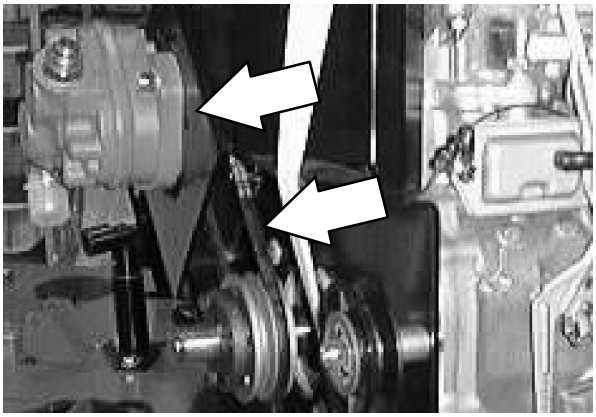


7. Remove the two hydraulic fittings from the old hydraulic pump and install into the new pump in the same orientation.

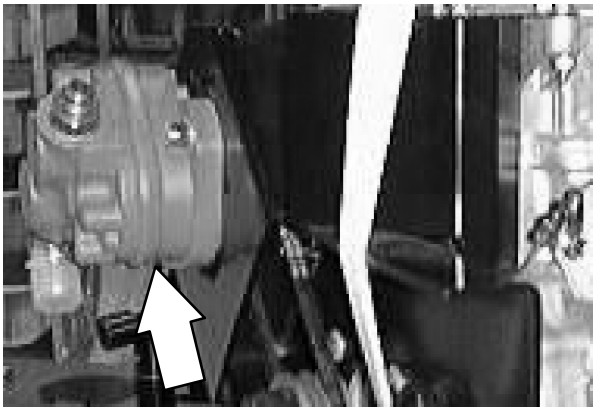


8. Install the new hydraulic pump assembly onto the mount plate on the side of the engine. Reinstall the hardware. Leave loose for now.

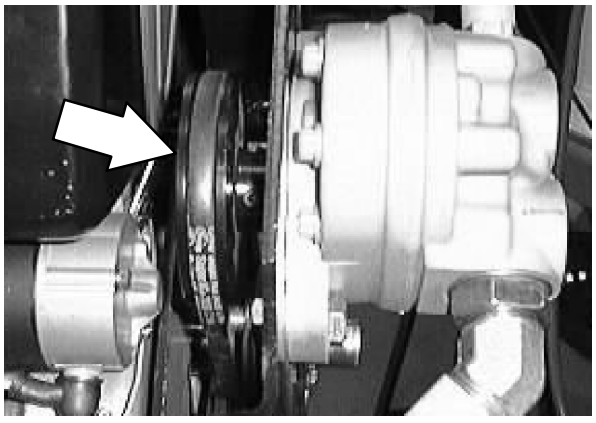
9. Position the V-belt onto the pump sheave.



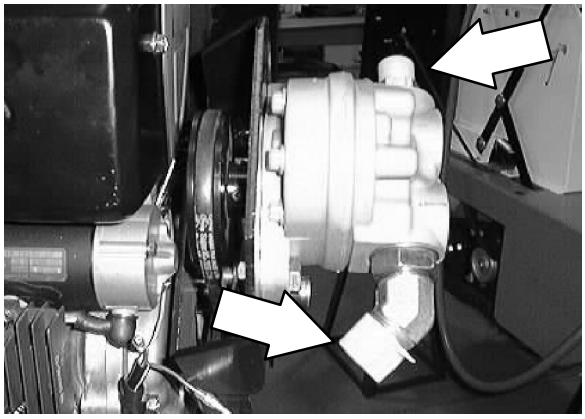
10. Pull the hydraulic pump back to tension the V-belt. Tighten the pump mounting hardware.



11. Use a straight edge to align the hydraulic pump sheave with the sheave on the engine. Tighten the two set screws.

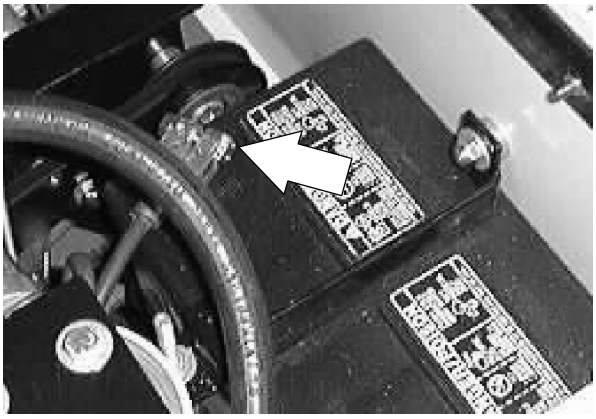


12. Reconnect the hydraulic hoses to the pump. See schematic in this section.



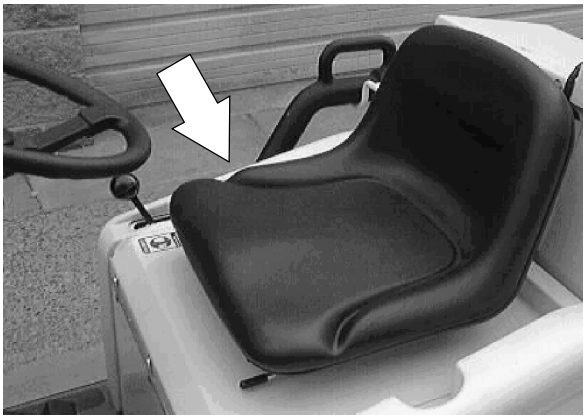
NOTE: Observe hydraulic cleanliness requirements when opening hydraulic lines.

13. Reconnect the battery cables.



14. Start the machine and check the new pump for proper operation and for leaks.

15. Disengage the prop rod and lower the seat support.

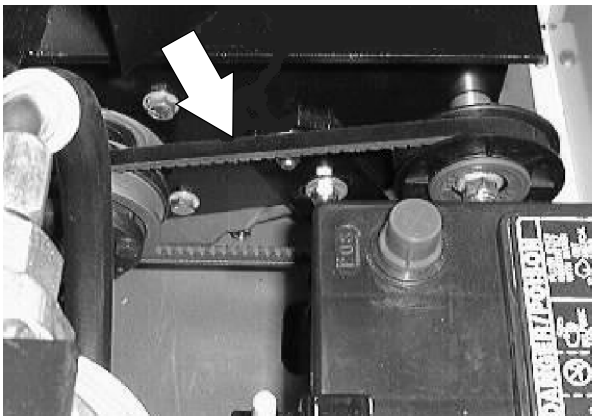


TO REPLACE HYDRAULIC PUMP V-BELT

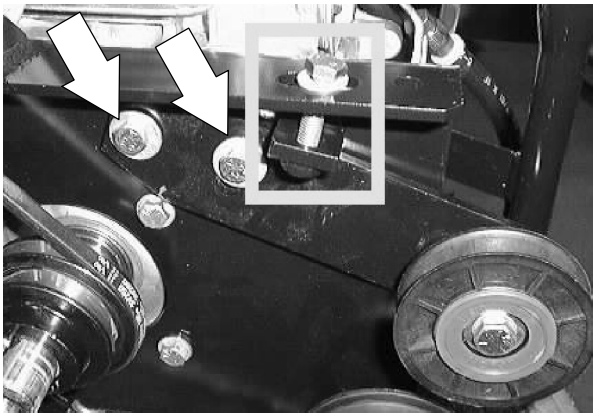
FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake, Turn Off Machine And Remove Key.

1. Tilt the seat assembly forward and engage the prop rod. Disconnect the battery cables from the battery.

2. Locate the main brush jackshaft belt tension idler pulley mount plate beside the machine battery.

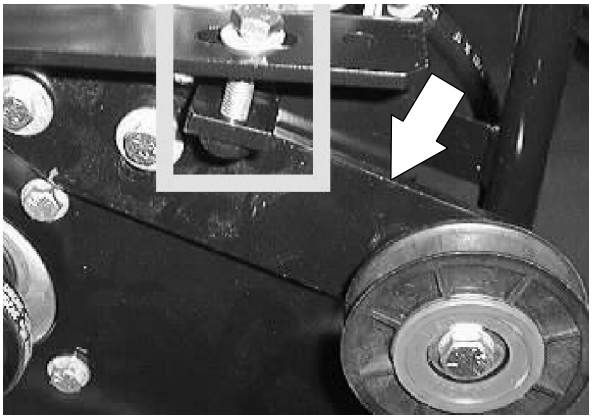


3. Loosen the nuts holding the idler mount plate to the main engine pulley plate.

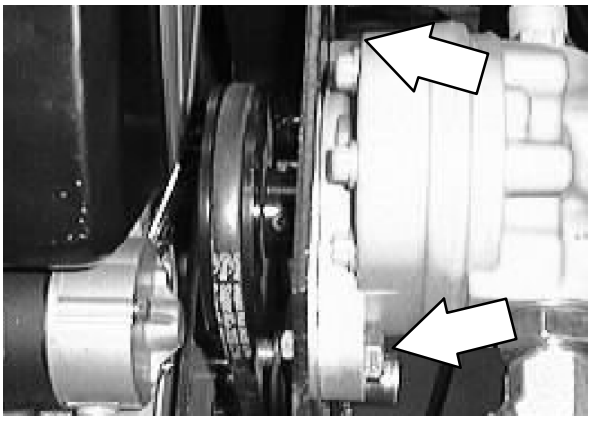


4. Push the idler pulley mount plate down to loosen the tension on the main brush center V-belt.

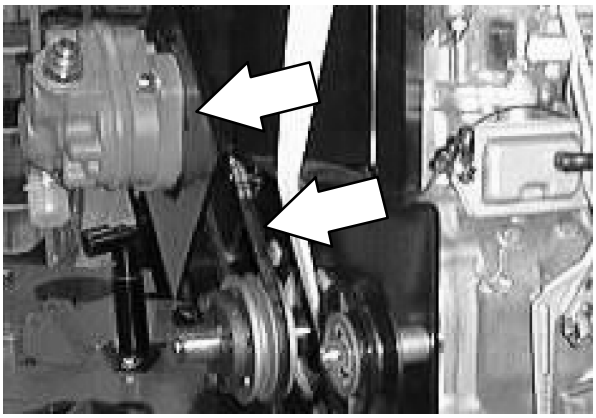
5. Remove the main brush jackshaft V-belt from the engine sheave.



6. Loosen the bolts holding the hydraulic pump to the mount plate. Push the pump to loosen the V-belt. Remove the V-belt from the pump sheave and engine sheave. Remove the V-belt from the machine.

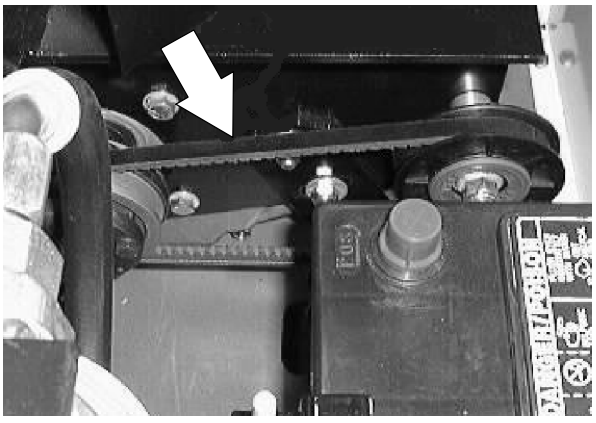


7. Install the new hydraulic pump V-belt onto the engine sheave and hydraulic pump sheave. Pull the pump up until the new V-belt is tight. Tighten the two nuts to 18 – 24 Nm (15 – 20 ft lb)

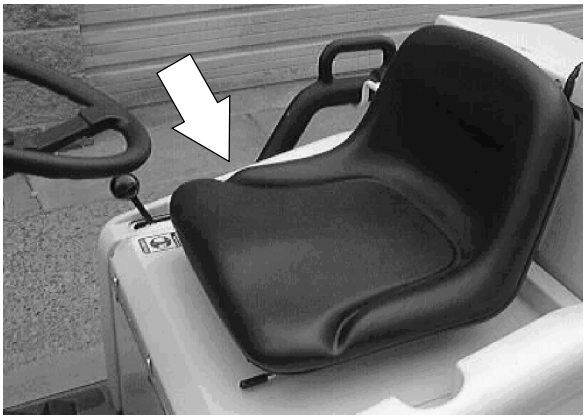


8. Install the existing main brush jackshaft V-belt onto the engine sheave. Pull the tension idler pulley mount plate up until the V-belt is tight. Tighten the two nuts to 18 – 24 Nm (15 – 20 ft lb).

9. Operate the machine and check the hydraulic pump for proper operation.

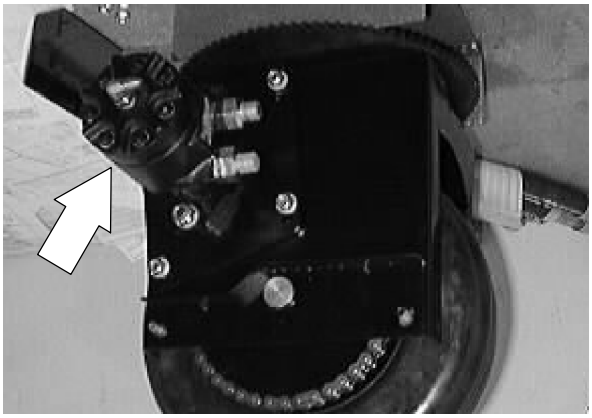


10. Disengage the seat rod and close the seat assembly.



HYDRAULIC DRIVE MOTOR

The front drive wheel motor propels the machine forward and reverse. The propel pump provides hydraulic flow to the drive motor through the foot operated control valve..

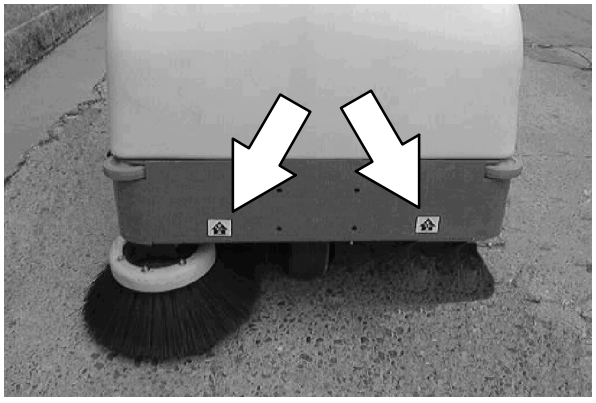


TO REPLACE DRIVE MOTOR

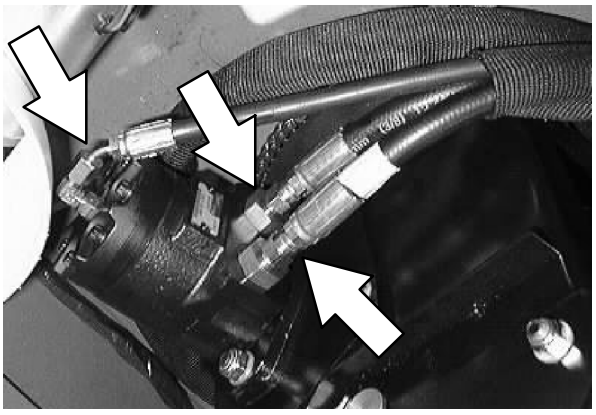
FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake, Turn Off Machine And Remove Key.

1. Tilt the seat assembly forward and engage the prop rod. Disconnect the battery cables from the battery.

2. Raise the front of the machine and install jackstands under the machine frame.

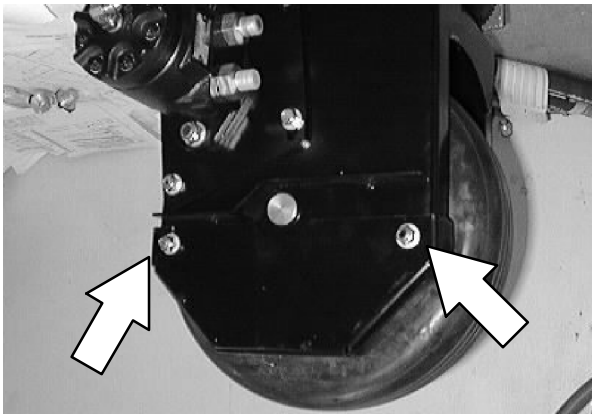


3. Mark, disconnect, and plug the three hoses leading to the drive motor.

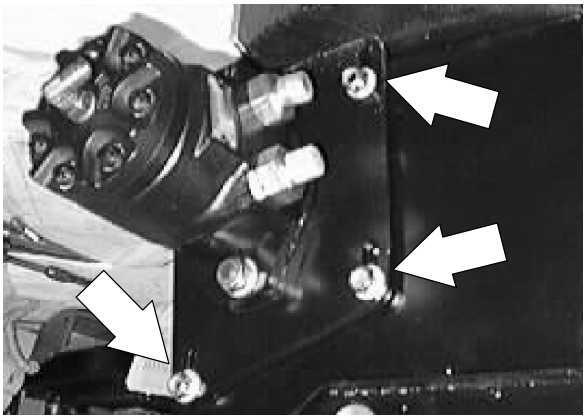


NOTE: Observe hydraulic cleanliness requirements when opening hydraulic lines.

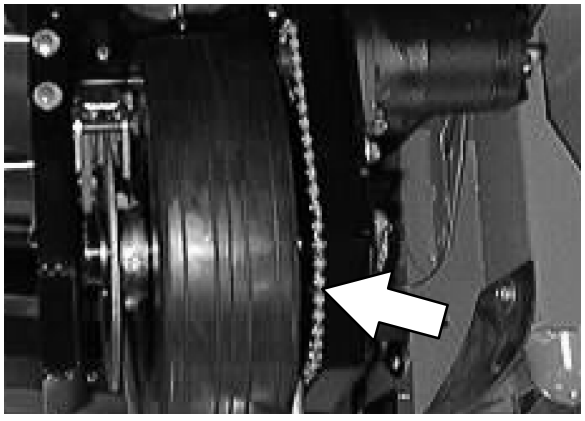
4. Remove the two nuts holding the chain guard to the wheel support. Remove the chain guard.



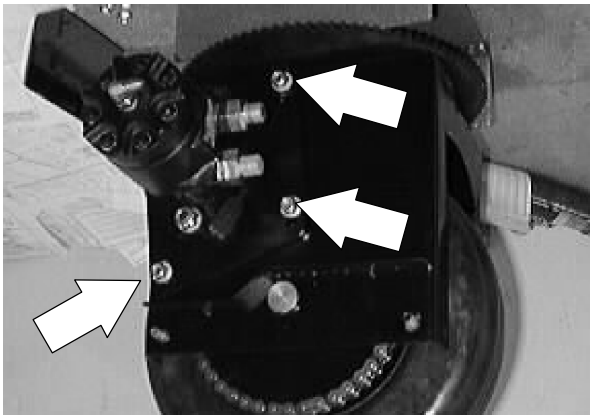
5. Loosen the three nuts holding the hydraulic motor to the wheel support. Let the hydraulic motor drop down so the drive chain has some slack.



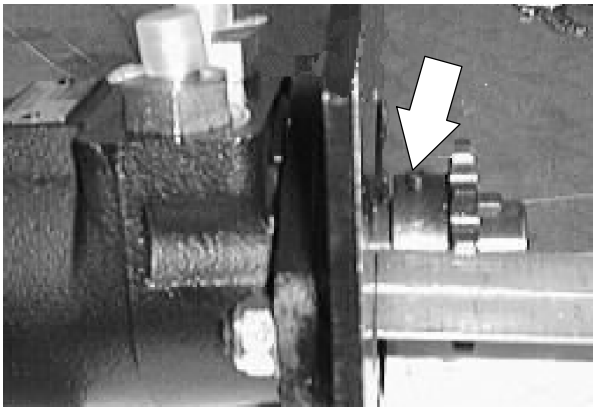
6. Turn the front tire until the master link is visible at the bottom of the drive sprocket. Remove the master link from the drive chain. **Make sure to retain the four small O-rings from behind the master link clip.**



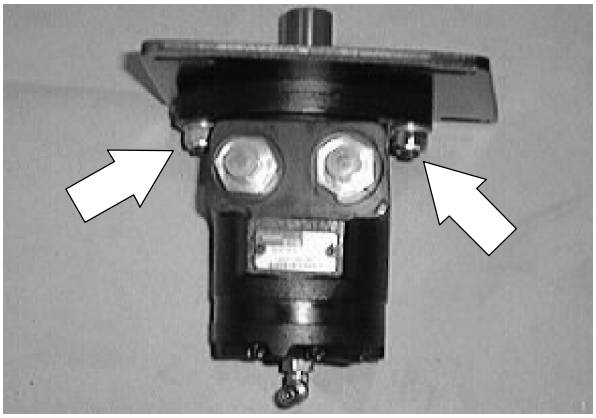
7. Remove the three nuts holding the drive motor, sprocket, and mount plate to the drive assembly. Remove the motor assembly from the machine.



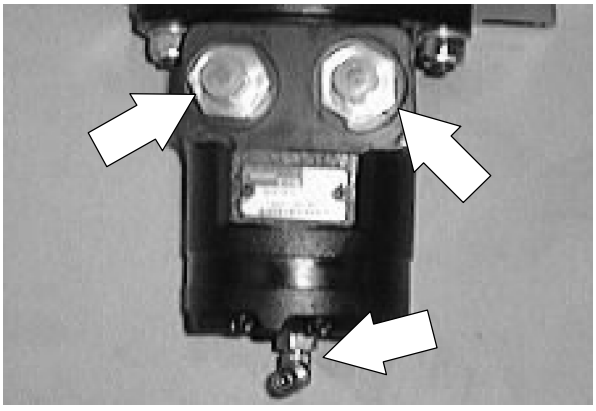
8. Loosen the sprocket set screws. Remove the sprocket and key from the drive motor shaft.



9. Remove the two screws, washers, and nuts holding the old drive motor to the mount plate. Remove the plate from the motor. *Note the orientation of the motor to the mount plate.*

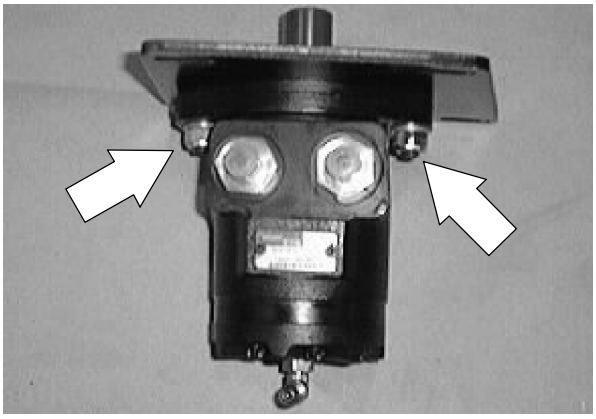


10. Remove the three hydraulic fittings from the old motor and install into the new hydraulic motor in the same orientation.

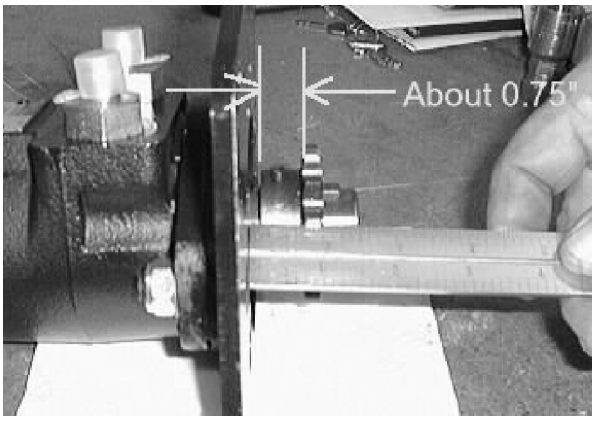


NOTE: Observe hydraulic cleanliness requirements when opening hydraulic lines.

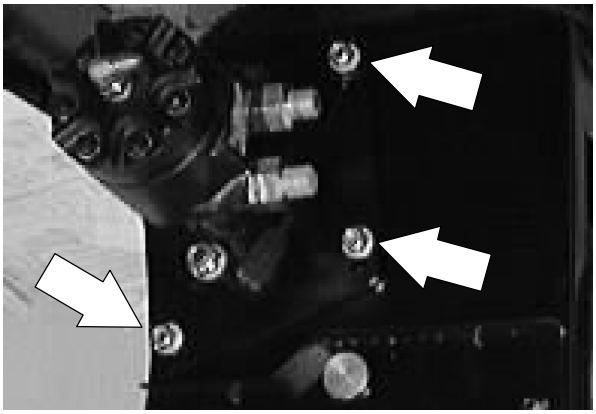
11. Position the new motor and fittings onto the existing motor mount plate. *Note the orientation of the motor to the mount plate.* Install the two flat screws, sleeves, washers, and nuts. Tighten to 37 – 48 Nm (26 – 34 ft lb).



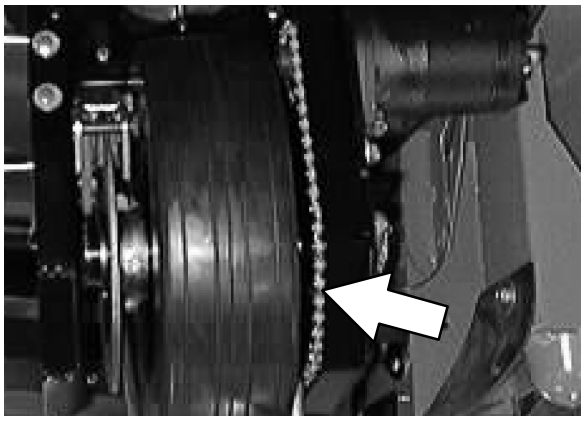
12. Position the key and sprocket onto the output shaft of the new motor. Set the face of the sprocket teeth about 3/4 inch from the face of the motor mount plate. Hand tighten the set screw tight.



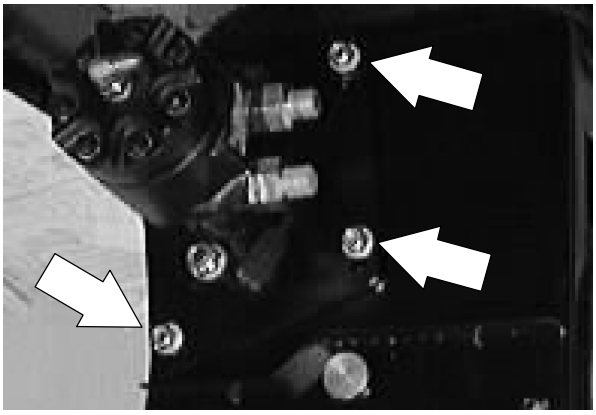
13. Position the new motor and mount plate assembly onto the drive assembly. Reinstall the three nuts and washers. *Leave loose for now.*



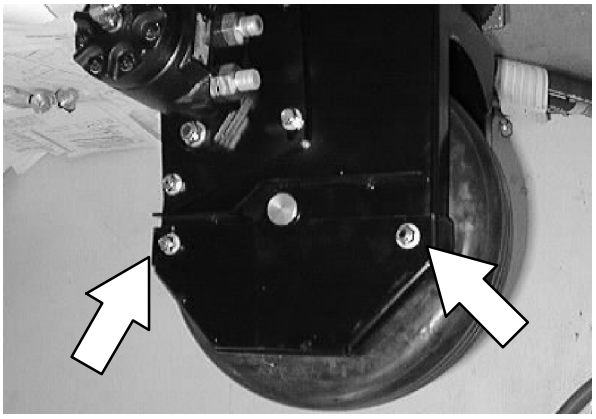
14. Spread the drive chain and install around the large sprocket on the front wheel assembly. Reinstall the master link. **Make sure the four small O-rings are in place behind the master link clip.**



15. Push the hydraulic motor up until the drive chain is tight *(+/- 1/8 inch at mid-point)*. Tighten nuts to 18 – 24 Nm (15 – 20 ft lb).

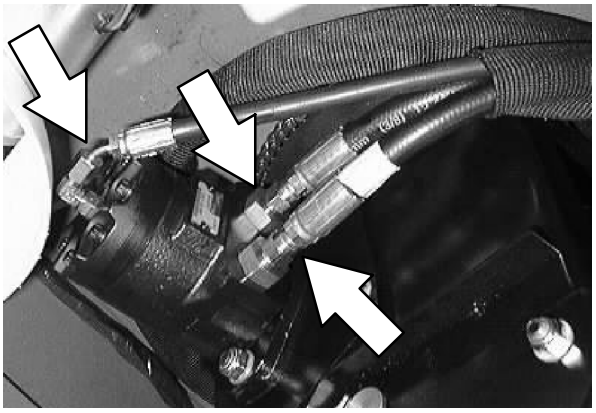


16. Reinstall the drive chain guard and tighten the two nuts to 18 – 24 Nm (15 – 20 ft lb).

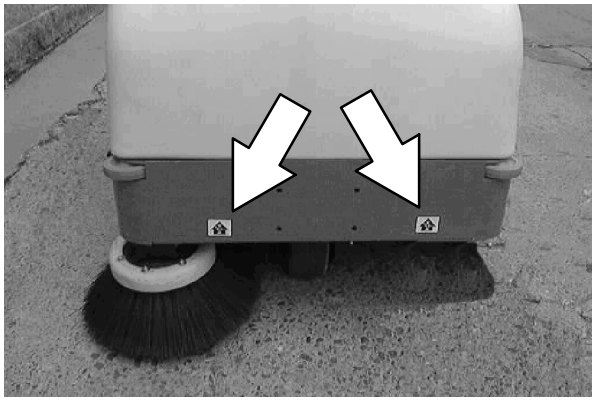


17. Connect the hydraulic hoses to the new drive motor. See schematic in this section.

NOTE: Observe hydraulic cleanliness requirements when reconnecting hydraulic lines.

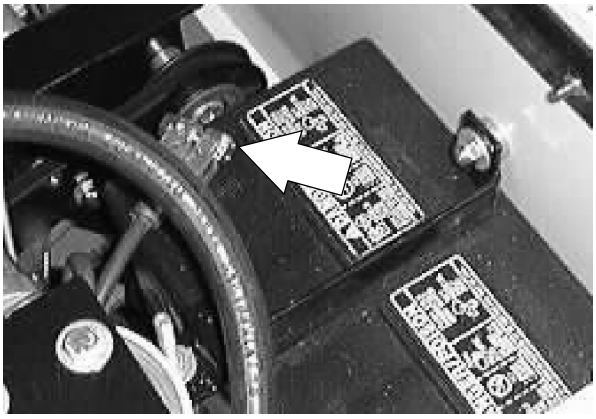


18. Remove the jack stands and lower the machine to the floor.

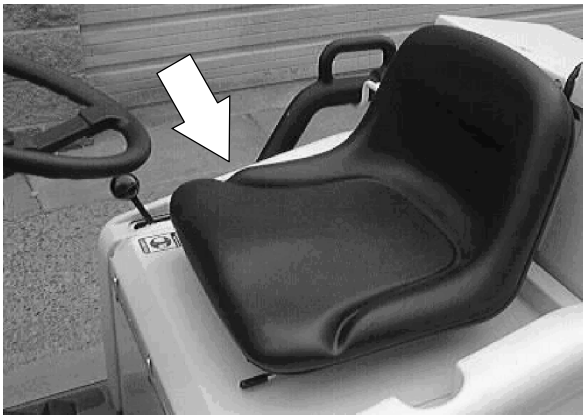


19. Reconnect the battery cables.

20. Start the machine and check the new drive motor for proper operation and for leaks.

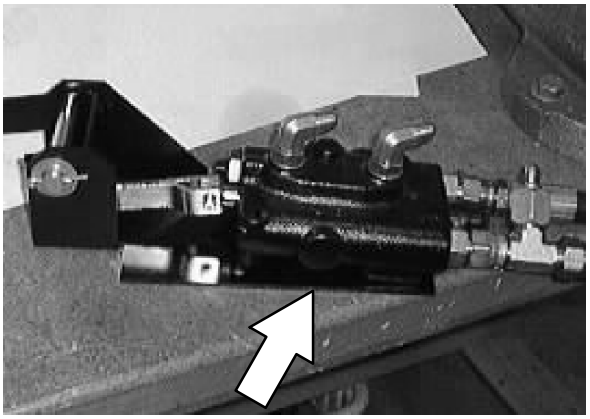


21. Disengage the prop rod and lower the seat support.



DIRECTIONAL CONTROL VALVE

The directional control valve is located on the under side of the frame in the area of the foot control pedal. The directional control valve is used to control the forward and reverse movement of the machine.

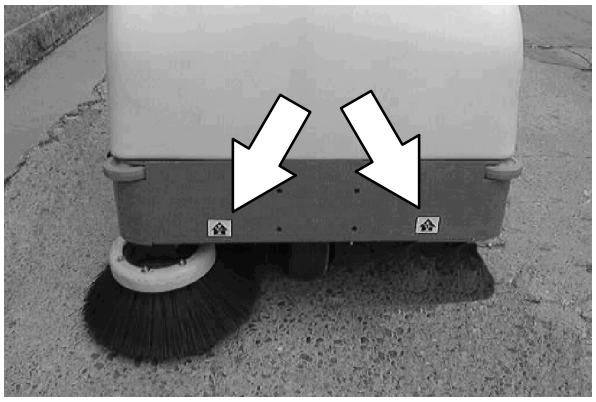


TO REPLACE DIRECTIONAL CONTROL VALVE

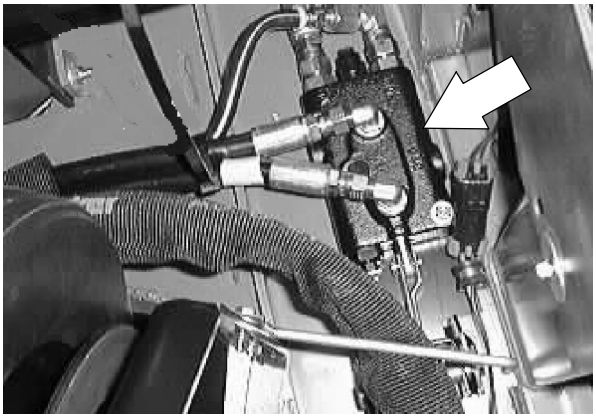
FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set Parking Brake, Turn Off Machine And Remove Key.

1. Tilt the seat assembly forward and engage the prop rod. Disconnect the battery cables from the battery.

2. Raise the front of the machine and install jackstands under the machine frame.

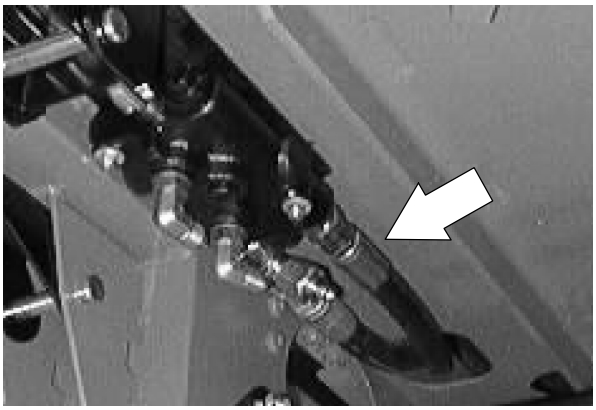


3. Go under the machine in the front, right corner and locate the valve under the directional pedal.

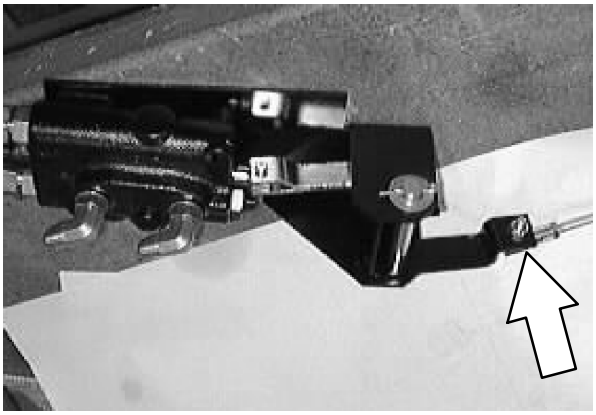


4. Mark, disconnect, and plug the five hoses leading to the control valve.

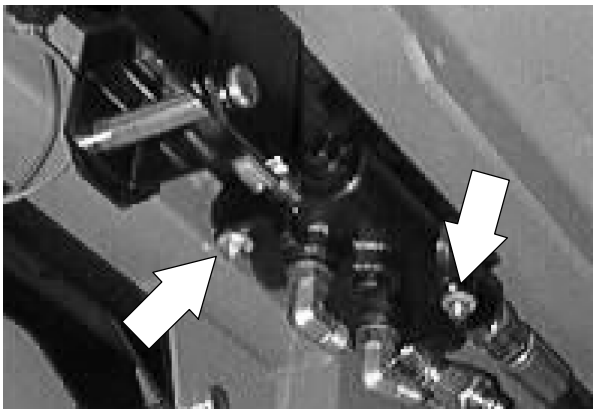
NOTE: Observe hydraulic cleanliness requirements when opening hydraulic lines.



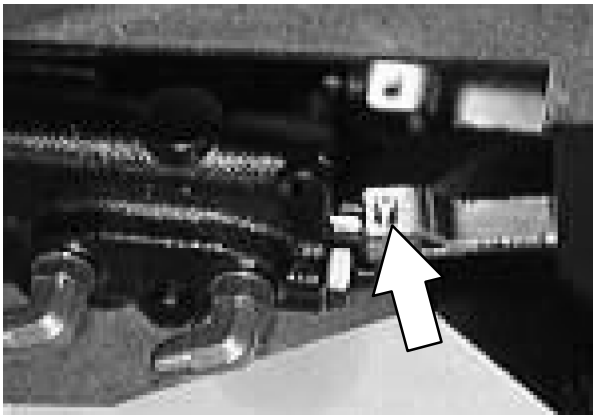
5. Disconnect the lower ball joint from the directional pedal down at the control valve linkage.



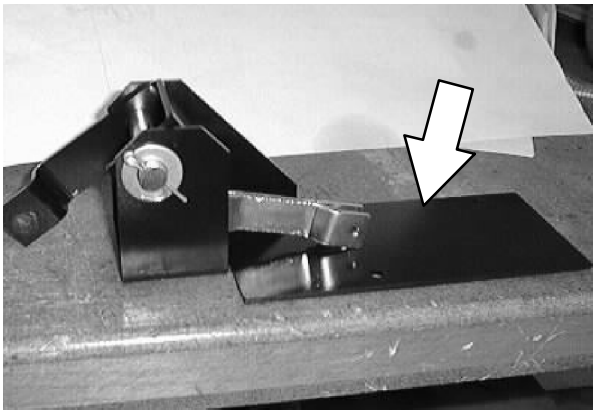
6. Remove the two screws holding the control valve and mount plate assembly to the bottom of the machine frame. Remove the assembly from the machine.



7. Remove the cotter pin and clevis pin holding the pivot linkage to the top of the control valve.

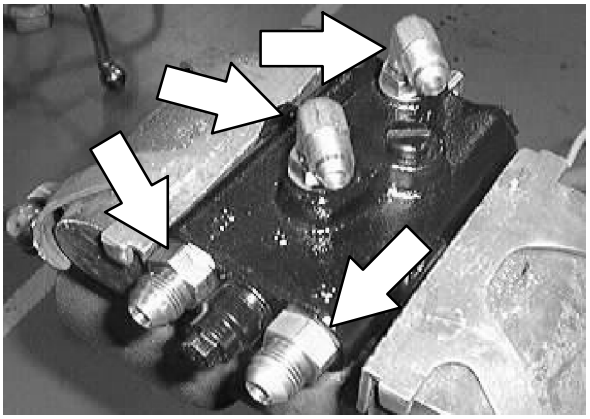


8. Remove the valve from the mount plate.



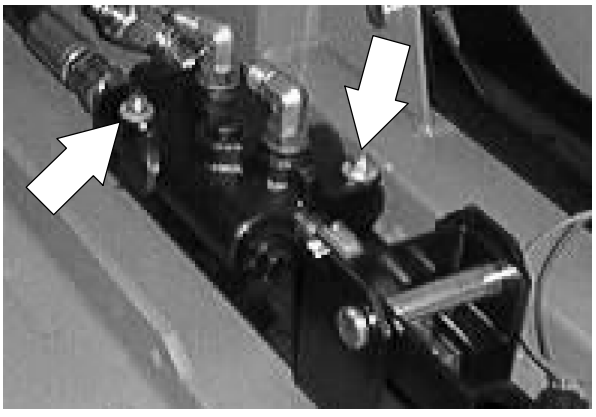
9. Remove the four hydraulic fittings from the old control valve and install into the new valve in the same orientation.

NOTE: Observe hydraulic cleanliness requirements when opening hydraulic lines.

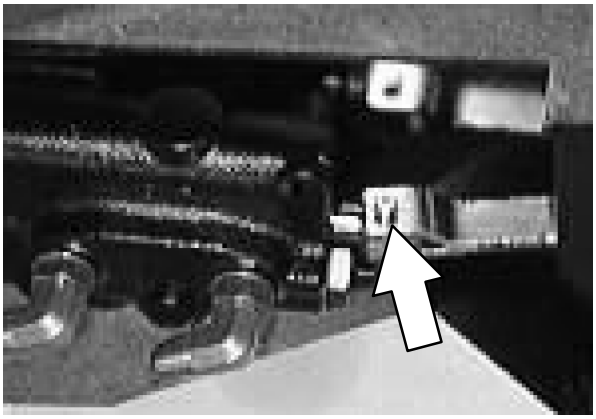


10. Position the new valve onto the mount plate and reinstall the hardware. Tighten to 11 – 14 Nm (7 – 10 ft lb).

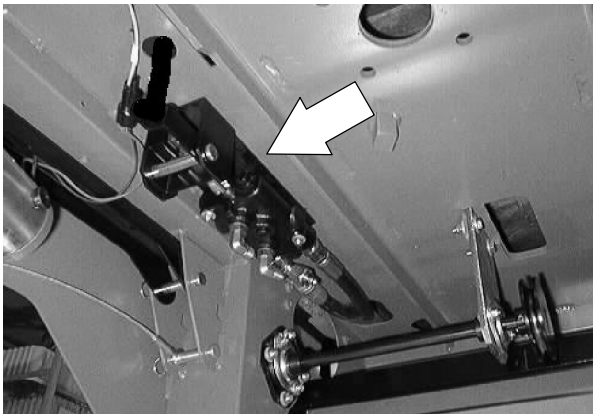
NOTE: Position hex nuts on the valve side.



11. Align the mount hole in the pivot linkage with the hole in the top of the valve plunger. Reinstall the cotter and clevis pin.

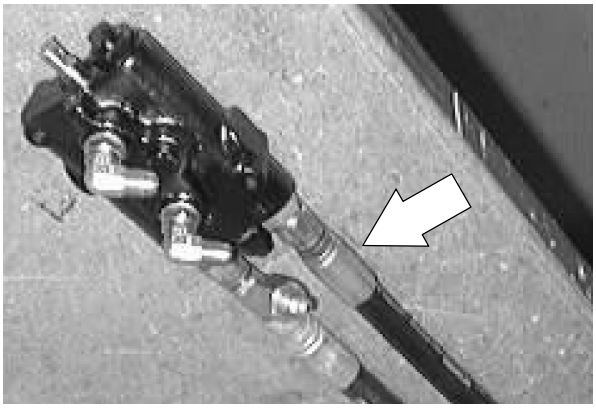


12. Position the new valve and mount plate assembly into the machine with the pivot linkage facing the front of the machine. Reinstall the mounting hardware and tighten to 11 – 14 Nm (7 – 10 ft lb).

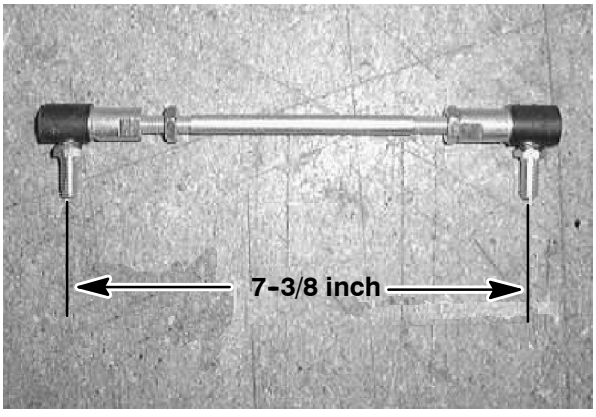


13. Reconnect the hydraulic hoses to the new valve. See schematic in this section.

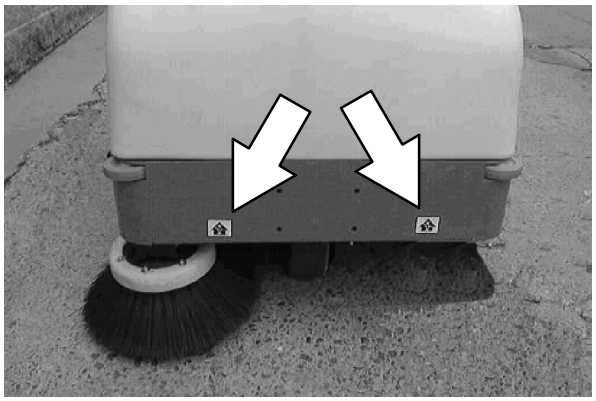
NOTE: Observe hydraulic cleanliness requirements when opening hydraulic lines.



14. Reconnect the ball joint and rod from the directional pedal to the pivot linkage. Check the rod for the correct dimension. The distance between the center line of the two ball joints should be 7–3/8 in. See TO ADJUST DIRECTIONAL PEDAL LINKAGE instructions in the CHASSIS section.

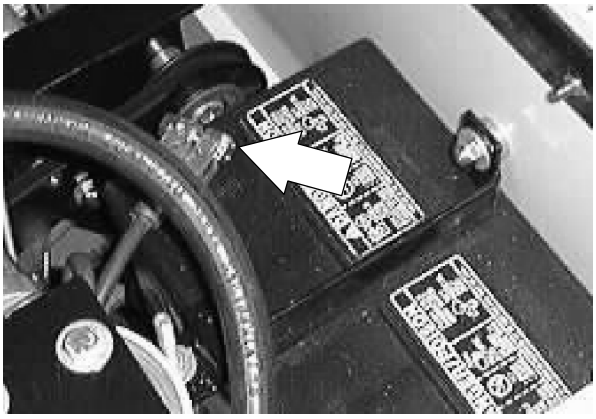


15. Remove the jack stands and lower the machine to the floor.

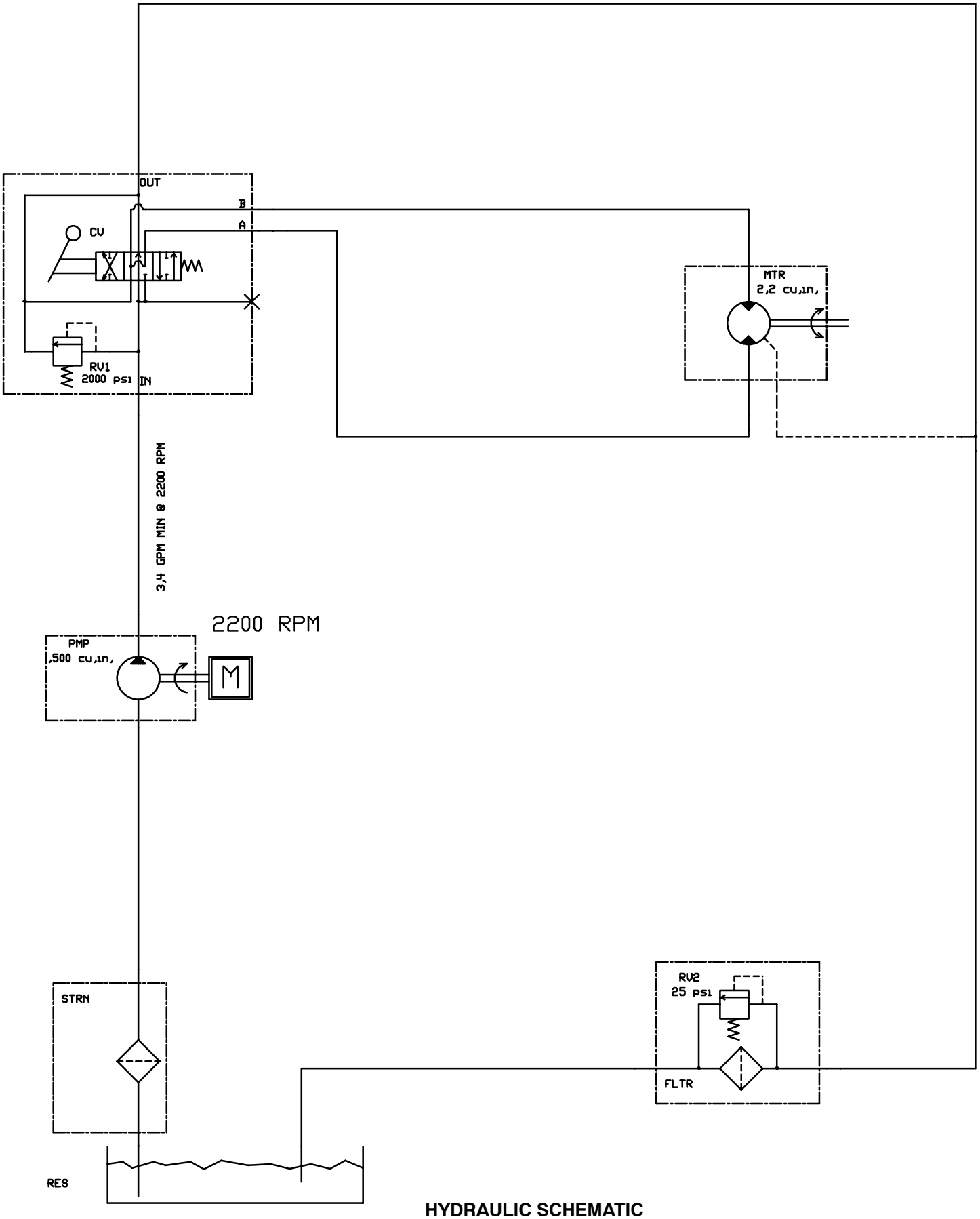


16. Reconnect the battery cables.

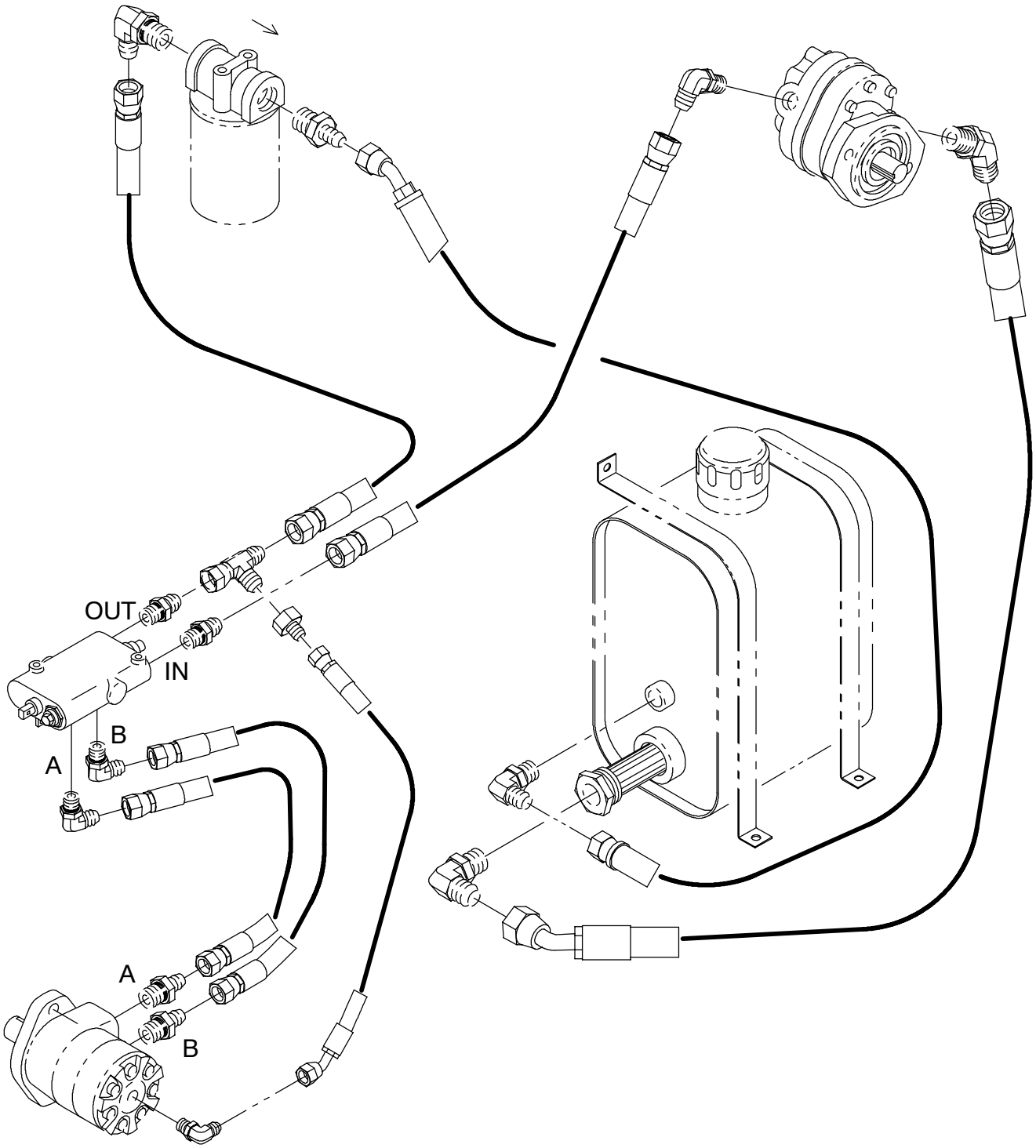
17. Start the machine and check the new directional valve for proper operation and for leaks.



18. Disengage the prop rod and lower the seat support.



HYDRAULIC SCHEMATIC

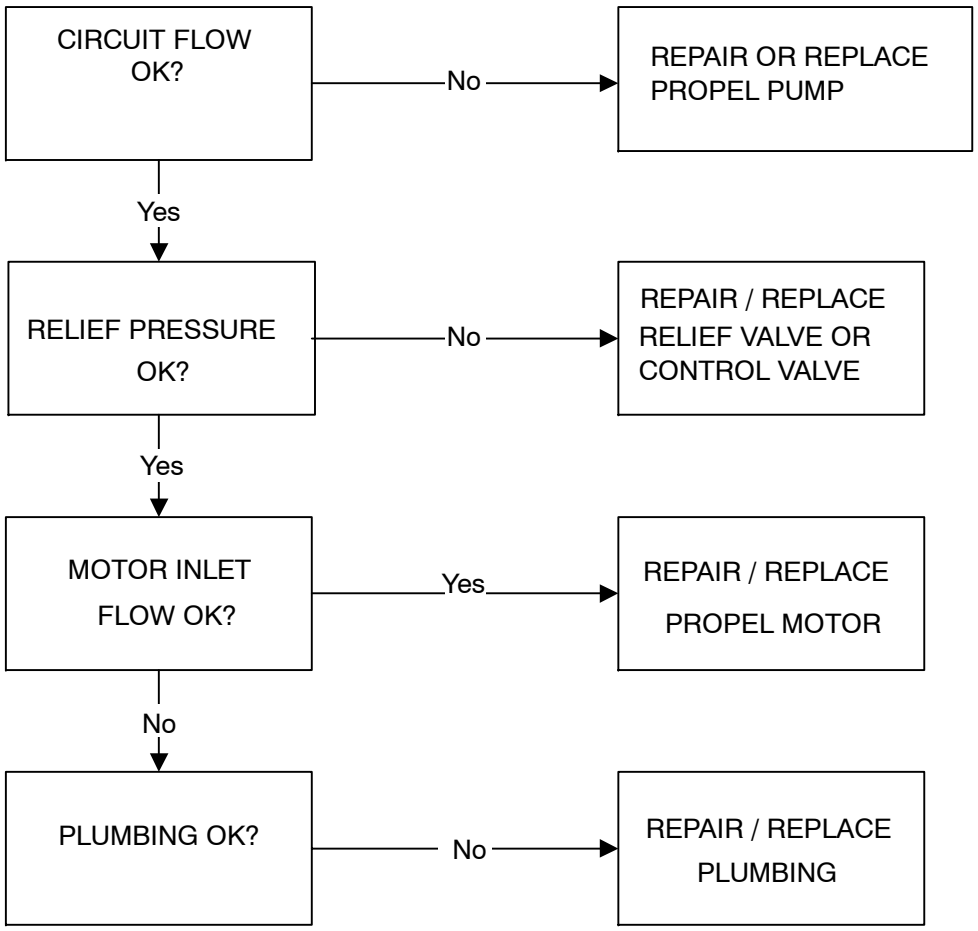


HYDRAULIC HOSE DIAGRAM

TROUBLESHOOTING

The troubleshooting chart that follows is organized to lead you through the hydraulic propel circuit.

PROPEL MOTOR WILL NOT PROPEL

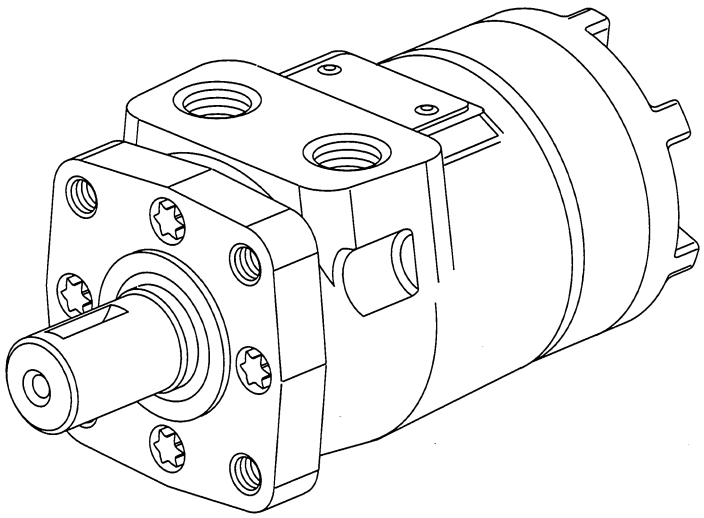


Char-Lynn®
Hydraulic Motor

No. 7-145
January, 1995

EATON

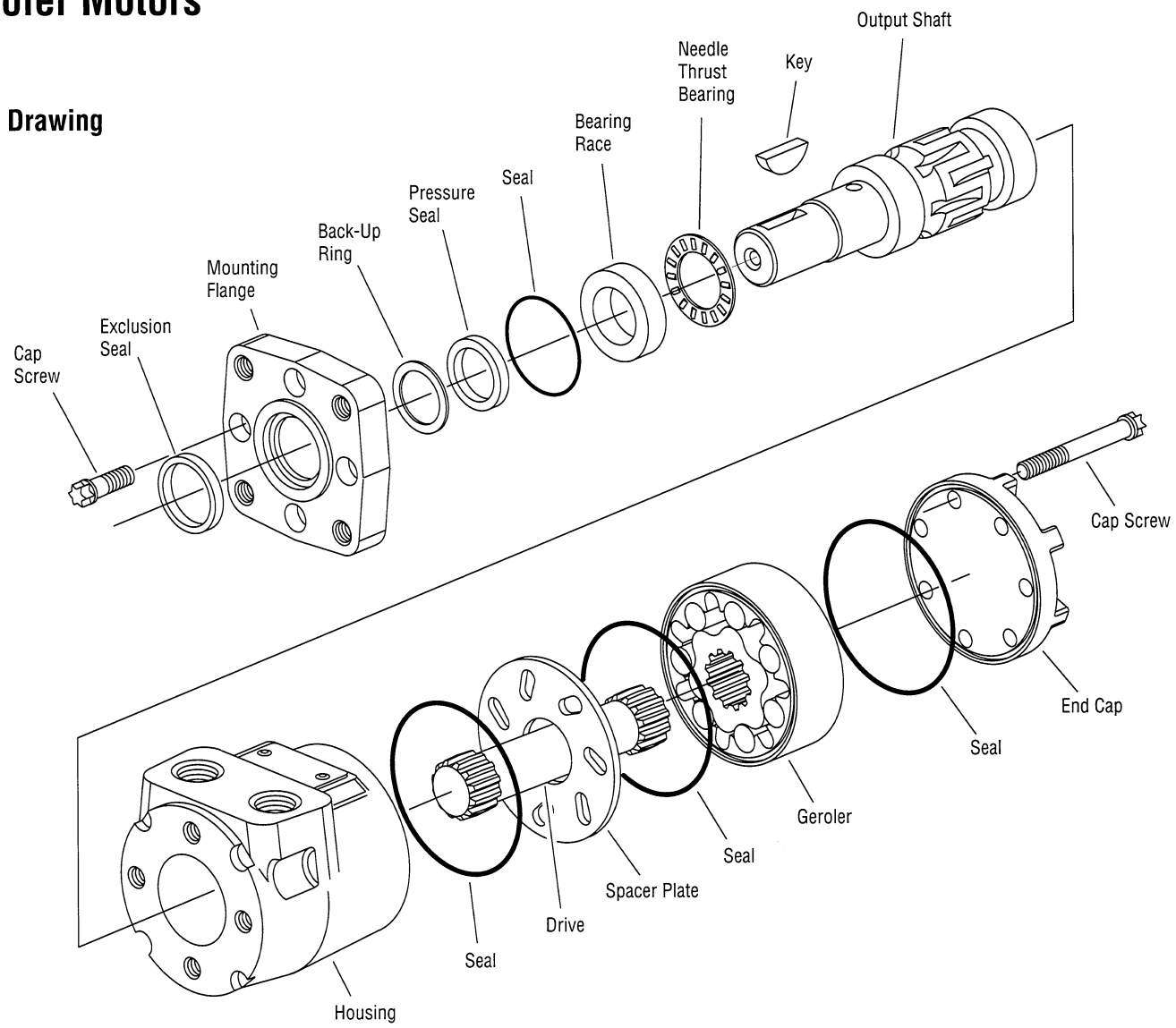
Repair Information



T Series
General Purpose Geroler® Motor 001

T Series
Geroler Motors

Parts Drawing



Required Tools

- Torque wrench (34 Nm [300 lb-in] capacity)
- 300 - 400 mm [12 - 16 in.] breaker bar
- 5/16 in. – 6 point (E10 Drive) socket no. 64489-000* (Heavy Duty 56 Nm [500 lb-in] capacity)
- Small blade screwdriver
- 3/16 in. hex key
- Shaft seal installation tool P/N 600523*
- Shaft sleeve or bullet
  P/N 600304* for 1 inch dia. shaft
  P/N 600466* for 7/8 inch dia. shaft

*Tools available, through Eaton order entry department.

T Series
Geroler Motors

Disassembly

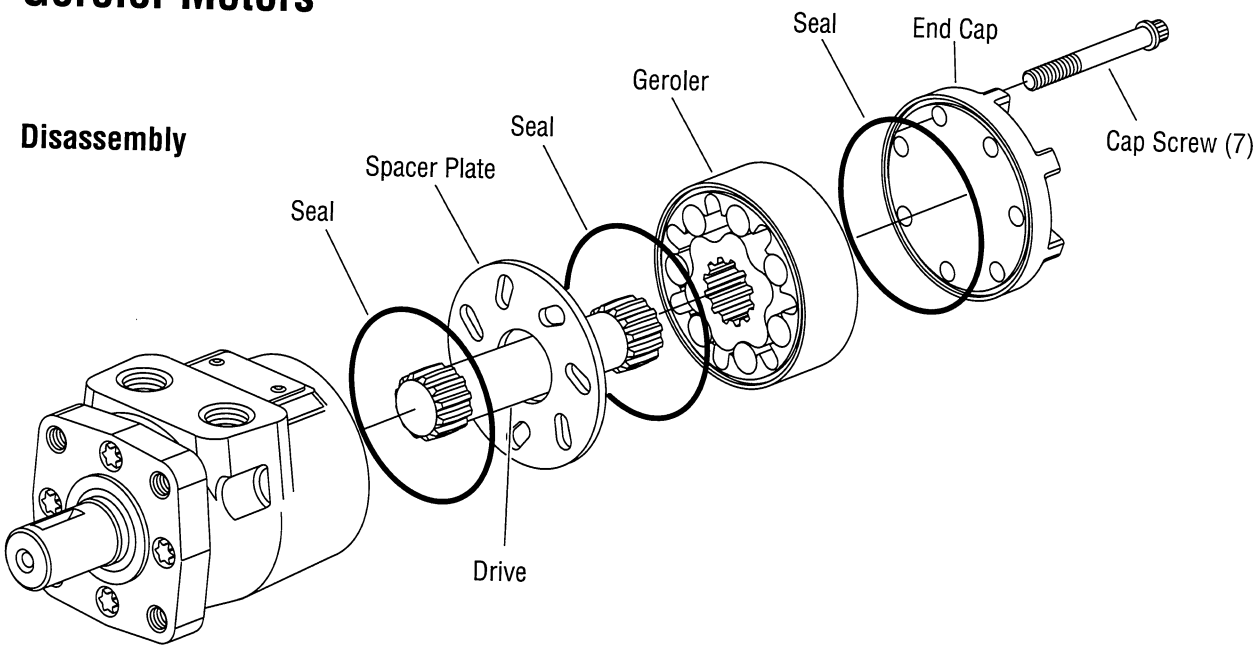


Figure 1

Cleanliness is extremely important when repairing hydraulic motors. Work in a clean area. Before disconnecting the hydraulic lines, clean the port area of the motor. Before disassembly, drain the oil from the motor. Then plug the ports and thoroughly clean the exterior of the motor. Check the output shaft, remove any burrs, nicks, or sharp edges.

1 Clamp the motor in a vise so the shaft is vertical and the end cap is on top. Clamp on the mounting flange, use just enough clamping force to hold the motor securely. Protect the mounting flange with soft vise jaws.

2 Remove the 7 cap screws from the end cap and disassemble the motor as shown in figure 1. Do not disassemble the Geroler.

3 Un-clamp the motor and remove the output shaft, thrust needle bearing, and thrust bearing race, see figure 2.

4 Clamp the motor in a vise so the mounting flange is on top. Clamp across the port area. **Do Not clamp on the motor housing.** Use just enough clamping force to hold the motor securely.

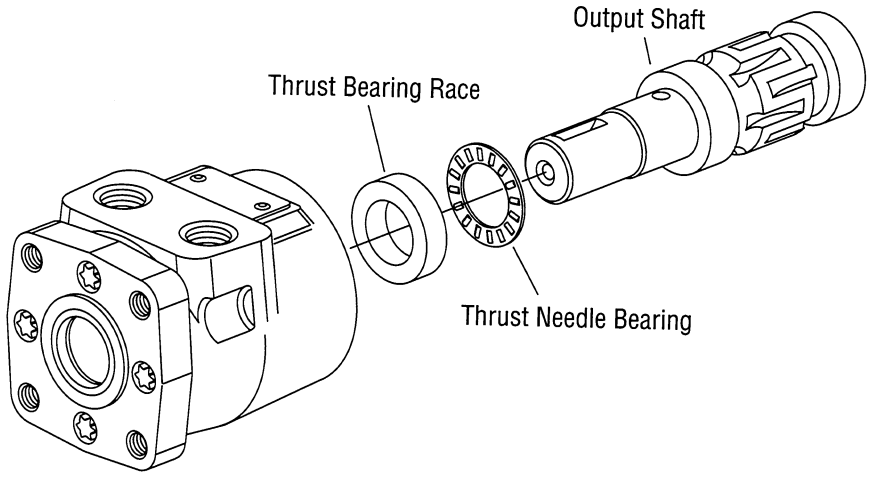


Figure 2

T Series
Geroler Motors

Disassembly

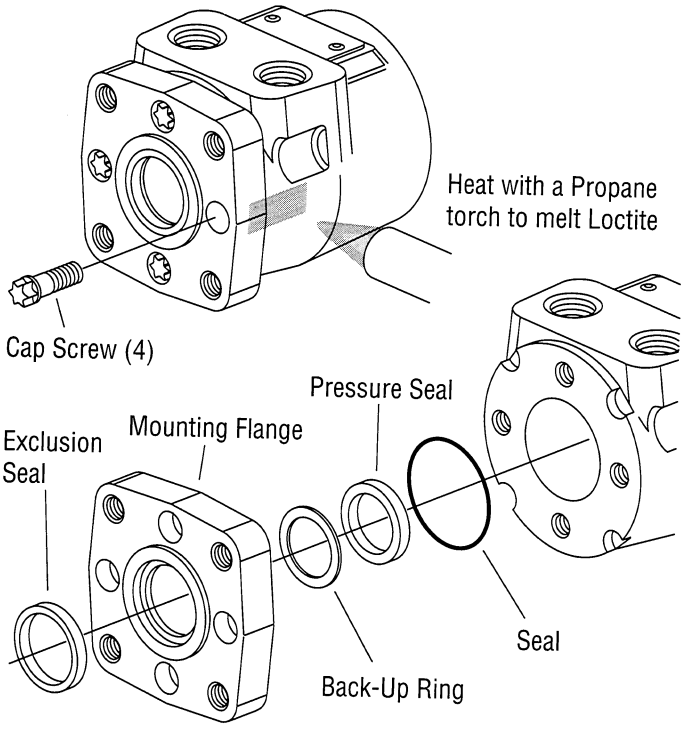


Figure 3

5 Remove the 4 cap screws that hold the mounting flange to the motor housing.

Caution: These screws were Loctited during assembly. **Do Not exceed 56 Nm [500 lb-in] of removal torque.**

If the Loctite is holding the screws too tightly, heat the motor housing, with a propane torch, while turning the screw. Apply heat to where the screw threads into the motor housing, see figure 3. Apply just enough heat to remove the screw, do not overheat the motor housing or mounting flange.

6 Remove the mounting flange from the motor housing. The exclusion seal, pressure seal, and back-up ring will come off with the mounting flange.

7 Carefully remove the exclusion seal, pressure seal, and back-up ring from the mounting flange. A seal removal tool may be fabricated by bending and rounding the end of a small blade screwdriver, see figure 4.

Important: Do not damage the mounting flange where the shaft passes through it.

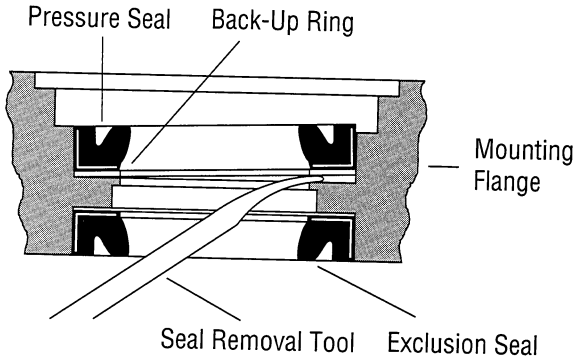


Figure 4

Reassembly

Check all mating surfaces. Replace any parts with scratches or burrs that could cause leakage. Wash all metal parts in clean solvent. Blow them dry with pressurized air. Do not wipe parts dry with paper towels or cloth. Lint in a hydraulic system will cause damage. Check the key way and chamfered area of the output shaft; remove any nicks, burrs, or sharp edges that could damage the shaft seals during reassembly.

Note: Always use new seals when reassembling hydraulic motors. Refer to parts list 6-146 for seal kit part numbers, replacement parts, and ordering information.

Important: During reassembly lubricate the new seals with a petroleum jelly like Vaseline. Also lubricate machined surfaces and bearings with clean hydraulic fluid.

8 Remove all of the old Loctite from the mounting flange cap screws and their threaded holes. The threads must be clean and dry for the new Loctite to hold properly.

9 Lubricate and install the output shaft, needle thrust bearing, and bearing race into the housing.

Important: Do not permit oil to get into the four threaded holes.

10 Lubricate the exclusion seal and press it into its seat in the mounting flange. Figure 5 shows the correct seal orientation.

T Series Geroler Motors

Reassembly

11 Lubricate and install the back-up ring and pressure seal. Use seal installation tool no. 600523 to press the pressure seal into place, see figure 5.

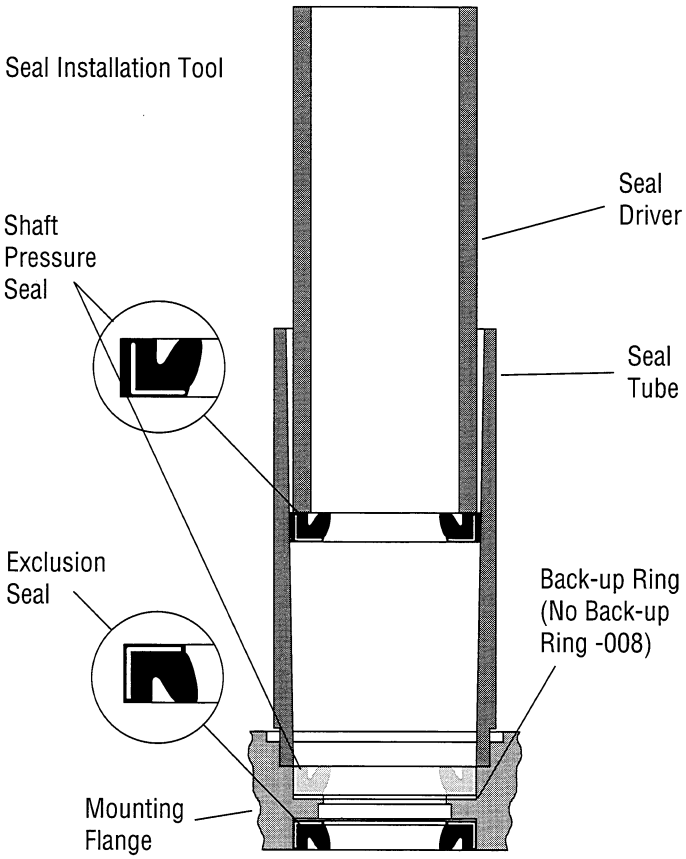


Figure 5

Important: Be sure the exclusion seal and pressure seal are undamaged and properly seated.

12 Apply 3 or 4 drops of Loctite 277 to the threads of the four holes in the motor housing where the mounting flange will be attached. Apply the Loctite so that it coats the threads. Remove all excess Loctite.

13 Install a protective sleeve or bullet over the output shaft. Lubricate the inner edges of the exclusion and pressure seals. Lubricate and install the 49 mm [1 15/16 in.] diameter o-ring seal on the mounting flange. Then slide the mounting flange down over the shaft.

14 Remove the protective sleeve and install the four cap screws. Tighten the cap screws, in a criss-cross pattern, to 28 Nm [250 lb-in]. Be sure the output shaft does not fall out of the housing.

Important: The Loctite must cure completely before the motor is put into service. Loctite curing time is 6 hours. Use of Loctite Primer reduces curing time to 15 minutes. Follow the instructions on the Loctite package.

15 Clamp the motor in the vise so the output shaft is vertical and down. Clamp on the mounting flange.

16 Pour clean hydraulic fluid into the motor to provide start-up lubrication.

17 Lubricate and install one of the three largest diameter seals in the groove in the motor housing.

18 Install the drive.

Note: If the splined ends of the drive are different lengths, install the longer end into the shaft.

Motor Timing

19 Align shaft timing dot with any bolt hole. Bolt hole will be used for timing reference.

20 Install spacer plate, and note the position of the threaded hole in housing aligned with the timing dot on shaft.

Important: Be sure the slots in the spacer plate provide passage for hydraulic fluid as well as the cap screws. If the spacer plate is flipped the motor will not operate.

21 Lightly stretch, lubricate and install the second of three large diameter seals in the groove in the Geroler.

22 Install the Geroler.

Standard Timing Align any star point with the threaded hole noted for the location of the timing dot, see figure 6.

Reverse Timing Align any star valley with the threaded hole noted for the location of the timing dot, see figure 6.

23 Rotate the geroler to align the screw holes and install drive spacer if applicable.

24 Lubricate and install the last one of the three large diameter seals in the groove in the end cap.

25 Install the end cap and seven cap screws.

26 Tighten the cap screws, in a criss-cross pattern, to 34 Nm [300 lb-in].

T Series
Geroler Motors

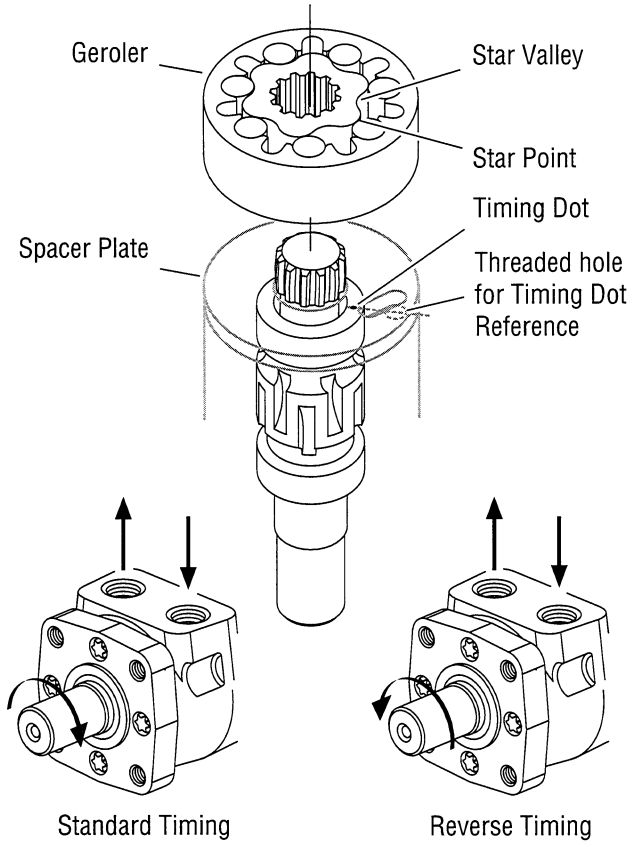
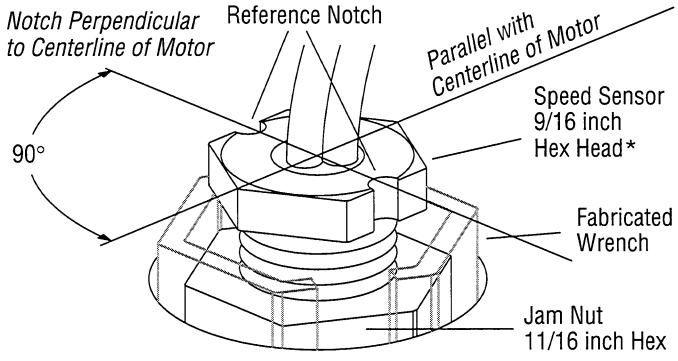


Figure 6

Speed Sensor Installation



*Turn Speed Sensor in to bottom (making sure jam nut is backed off sufficiently), back off 1/4 turn (CCW) and if reference notch(s) is not positioned as shown above continue turning (CCW) to align reference notch 90° off of centerline of motor or perpendicular to motor shaft. Hold speed sensor in this position and tighten jam nut to 8,5 — 14 Nm [75 — 125 lb-in].

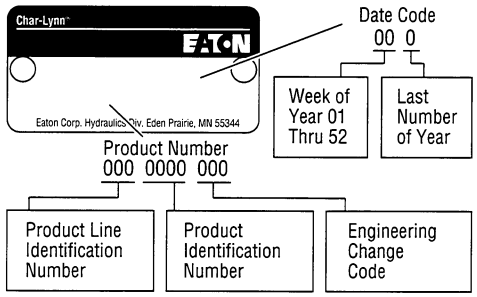
How to Order Replacement Parts

Each Order Must Include the Following:

1. Product Number
2. Date Code
3. Part Name
4. Part Number
5. Quantity of Parts

For More Detailed Information Contact Eaton Corp. Hydraulics Division 15151 Highway 5 Eden Prairie, MN 55344.

- Specifications and performance Data, Catalog No. 11-885
- Replacement Part Numbers and Kit Information — Parts Information No. 6-146



Product Numbers—T Series -001

Add three digit prefix **—158**-to four digit number from chart for complete product number—Example 158-1068.

Mounting	Shaft	Ports		Displ. cm³/r [in³/r] Product Number **158-xxxx** 36 [2.2]	49 [3.0]	66 [4.0]	80 [4.9]	102 [6.2]	131 [8.0]	157 [9.6]	195 [11.9]	244 [14.9]	306 [18.7]	370 [22.6]
2 Bolt Flange	1 in. Straight w/Woodruff Key	7/8-14 O-ring	**158-**	—	—	-1537	-1034	-1035	-1538	-1036	-1037	-1038	-1039	-1040
		1/2 NPTF	**158-**	—	—	-1540	-1026	-1027	-1541	-1028	-1029	-1030	-1031	-1032
		Manifold	**158-**	—	—	-1543	-1042	-1043	-1544	-1044	-1045	-1046	-1047	-1048
	1 in. SAE 6B Splined	7/8-14 O-ring	**158-**	—	—	-1552	-1082	-1083	-1553	-1084	-1085	-1086	-1087	-1088
		1/2 NPTF	**158-**	—	—	-1555	-1074	-1075	-1556	-1076	-1077	-1078	-1079	-1080
		Manifold	**158-**	—	—	-1558	-1090	-1091	-1559	-1092	-1093	-1094	-1095	-1096
4 Bolt Flange	1 in. Straight w/Woodruff Key	7/8-14 O-ring	**158-**	—	—	-1570	-1010	-1011	-1571	-1012	-1013	-1014	-1015	-1016
		1/2 NPTF	**158-**	—	—	-1573	-1002	-1003	-1574	-1004	-1005	-1006	-1007	-1008
		Manifold	**158-**	—	—	-1576	-1018	-1019	-1577	-1020	-1021	-1022	-1023	-1024
	1 in. SAE 6B Splined	7/8-14 O-ring	**158-**	—	—	-1579	-1058	-1059	-1580	-1060	-1061	-1062	-1063	-1064
		1/2 NPTF	**158-**	—	—	-1582	-1050	-1051	-1583	-1052	-1053	-1054	-1055	-1056
		Manifold	**158-**	—	—	-1585	-1066	-1067	-1586	-1068	-1069	-1070	-1071	-1072

158-1068

Eaton Corporation
Hydraulics Division
15151 Hwy. 5
Eden Prairie, MN 55344
Telephone 612/937-9800
Fax 612/937-7130

Eaton Ltd.
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Glenrothes, Fife
Scotland, KY7 4NW
Telephone 44/592-771-771
Fax 44/592-773-184

Form No. 7-145

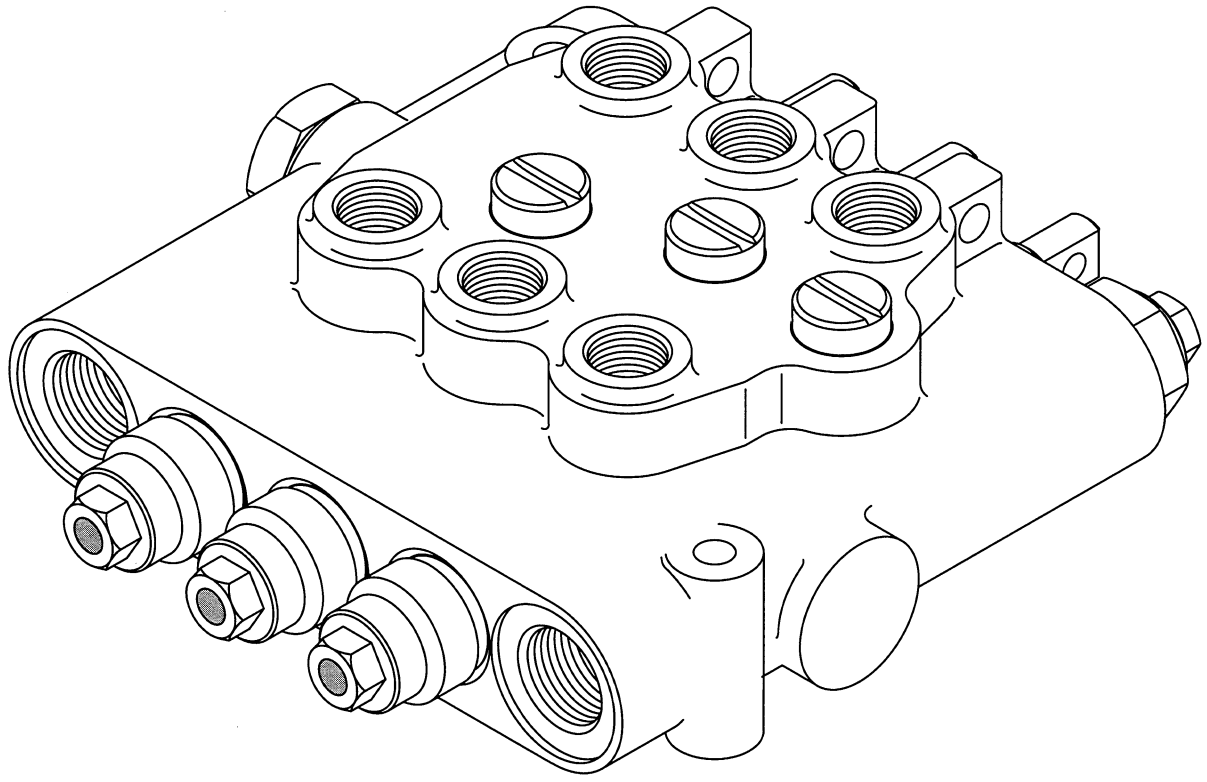
NO. 7-503

Revised June 1991

Eaton
Hydraulics
Division

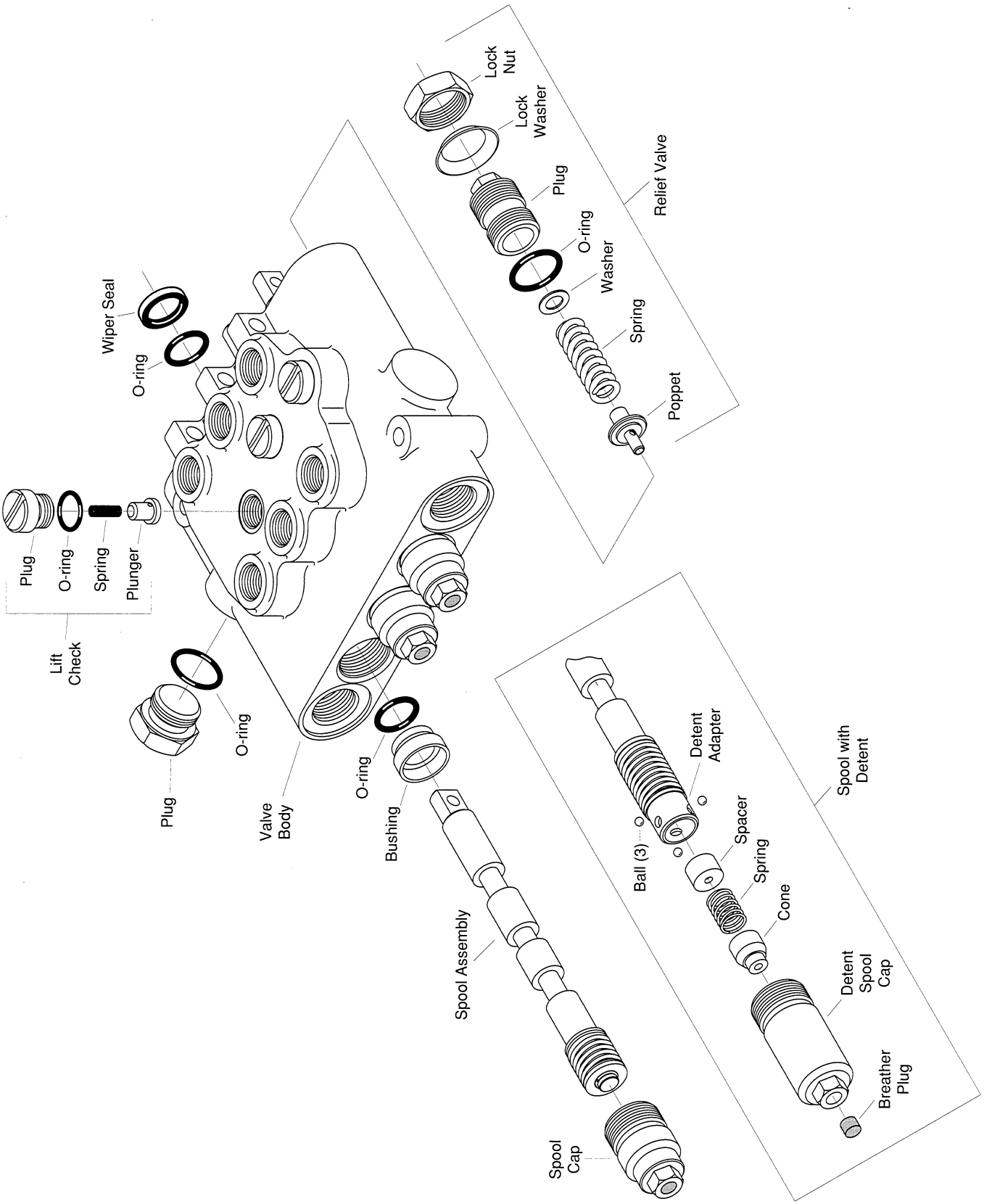
Repair Information

Model 30920 - 30930 Directional Control Valve



EATON

Parts Drawing



Disassembly

Refer to the Parts Drawing as you preform the repairs.

1. Plug all ports and clean the outside of the valve thoroughly.

2. Mark the spools and their specific bores. The spools are matched to the bores and must not be switched.

3. Remove the spool caps and slide the spool assemblies from their bores.

If spools are detented, take care not to lose the balls, spacer, detent spring, or cone.

4. Remove the o-rings and bushings from the spools.

5. Remove the wiper seals and o-rings from the valve body.

6. Disassemble the spool assemblies only if the retaining ring, spacer, spool spring, or washer need to be replaced see figure 1.

Note: Do not disassemble spool assemblies with detents.

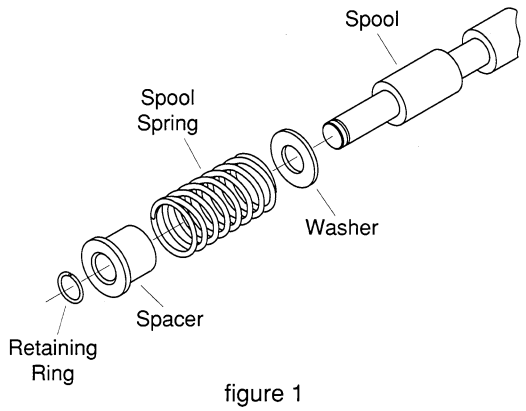


figure 1

7. Remove the lift check plugs, springs, and lift check plungers.

8. Remove the plug from the BYD port. This may be a solid plug, pressure beyond plug, or closed center plug.

9. Remove the relief valve lock nut, lock washer, plug, and o-ring .

10. Remove the washer, relief valve spring, and poppet.

11. Remove all o-rings and back-up rings from the plugs.

Inspection

1. Inspect the spools for wear. If wear is excessive, the valve becomes non-serviceable.

2. Inspect all of the springs and replace as necessary. Replace spool springs as shown in figure 1.

Note: The spool springs on detented spools are not serviceable.

3. Inspect the relief valve parts for wear and replace as necessary.

4. Inspect the lift check plungers and their seats in the valve body.

Reassembly

1. Wash all metal parts in clean solvent and blow them dry with compressed air. Do not wipe parts dry with paper towels or cloth. Lint in a hydraulic system will cause damage.

Note: Replace all o-rings, back-up rings and wiper seals as new.

2. Install new o-rings and wiper seals in the valve body.

3. Slide the bushings and new o-rings over the spools.

4. Liberally lubricate the spools with clean hydraulic fluid and install them in their proper bores.

5. Install the spool caps and tighten them to 20 - 25 lb-ft [27 - 34 Nm].

6. If spools are detented, install the spool caps as follows:

Remove the brass breather plug from the spool cap using a 3/16 inch drift punch.

Insert the punch through the hole in the spool cap.

Put the spacer, detent spring, cone, and balls into the detent adapter.

Hold the parts in place with the drift punch, while threading the spool cap into the valve body.

Tighten the cap to 20 - 25 lb-ft [27 - 34 Nm].

Install the breather plug.

7. Install the lift check plungers, springs, and lift check plugs. Use new o-rings and tighten the plugs to 20 - 25 lb-ft [27 - 34 Nm].

8. Install a new o-ring on the relief valve plug .

9. Insert the washer and relief valve spring into the plug .

10. Place the poppet on the spring and carefully install the relief valve into the valve body.

11. Install the lock washer and nut .

12. Adjust the relief valve setting and tighten the lock nut to 21 - 24 lb-ft [28 - 33 Nm].

Eaton Corporation **Hydraulics Division,** 15151 Highway 5, Eden Prairie, MN 55344 Telephone (612) 937-9800

Eaton G.m.b.H. **Hydraulics Division** ✉ 100 410 • D-5620 Velbert 1 West Germany ☎ 49-2051-2070

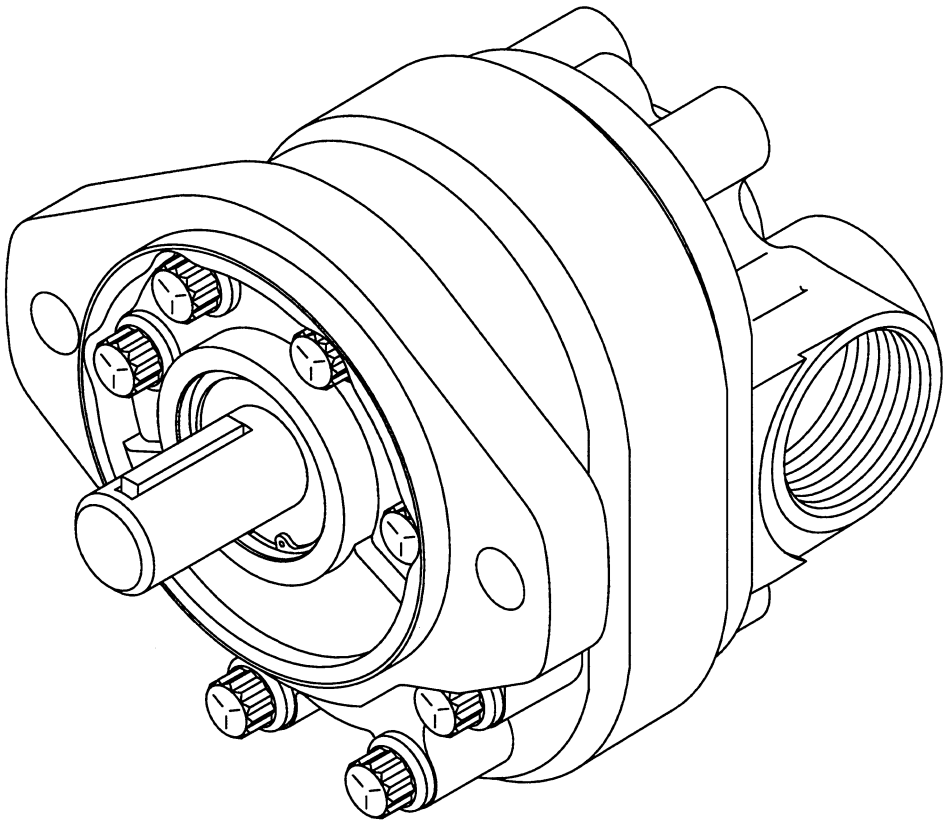
Printed in U.S.A.

FORM NO. 7- 503
Issued June 1989

Eaton®
Gear Pumps

No. 7-624
October,1995

Repair Information



Series 26
Model 26000 Single Gear Pumps

Introduction

Table of Contents

Introduction

This manual provides service information for the Eaton model 26000 single gear pumps. Step by step instructions for the complete disassembly, inspection, and reassembly of the pumps are included.

The following recommendations should be followed to insure successful repairs.

- Remove the pump from the application.
- Cleanliness is extremely important.
- Clean the port areas thoroughly before disconnecting the hydraulic lines.
- Plug the pump ports and cover the open hydraulic lines immediately after they're disconnected.
- Drain the oil and clean the exterior of the pump before making repairs.
- Wash all metal parts in clean solvent.
- Use compressed air to dry the parts. Do not wipe them dry with paper towels or cloth.
- The compressed air should be filtered and moisture free.
- Always use new seals when reassembling hydraulic pumps.
- For replacement parts and ordering information refer to parts list 6-634.
- Lubricate the new rubber seals with a petroleum jelly (vaseline) before installation.
- Torque all bolts over gasket joints, then repeat the torquing sequence to makeup for gasket compression.
- Verifying the accuracy of pump repairs on an authorized test stand is essential.

Identification and Tools Required

Product Number: 26 0 01 - R Z A

Series
26 = Gear Pump
(SAE "A" Mount)

Features
0 = Standard Single Pump
1 = Standard Single W/ Relief
2 = Flow Divider Backplate
3 = Flow Divider W/ Load Sense
4 = Tandem Backplate
5 = Multiple Pumps

Displacement cm^3/r [in^3/r]

01 = 6.6 [.40]	**08** = 22.5 [1.37]
02 = 8.2 [.50]	**09** = 24.3 [1.48]
03 = 9.5 [.58]	**10** = 25.2 [1.54]
04 = 10.8 [.66]	**11** = 27.7 [1.69]
05 = 13.8 [.84]	**12** = 29.0 [1.77]
06 = 16.7 [1.02]	**13** = 30.6 [1.87]
07 = 19.7 [1.20]	

Input Rotation
R = Right-hand (clockwise)
L = Left-hand (Counterclockwise)

Catalog / Non-Catalog
Z = Cataloged Pump
A-Y = Non-Cataloged Pump

Shafts , Porting Size and Location

Side Ports
A = 3/4 in. 11 Tooth, 1 5/16-12 UN-2B Suction, 7/8-14 UNF-2B Pressure
C = 3/4 in. Str. Keyed, 1 5/16-12 UN-2B Suction, 7/8-14 UNF-2B Pressure
E = 3/4 in. 9 Tooth, 1 5/16-12 UN-2B Suction, 7/8-14 UNF-2B Pressure
G = 5/8 in. Str. Keyed, 1 1/16-12 UN-2B Suction, 7/8-14 UNF-2B Pressure
J = 5/8 in. 9 Tooth, 1 1/16-12 UN-2B Suction, 7/8-14 UNF-2B Pressure
L = 5/8 in. Str. Keyed, 1 5/16-12 UN-2B Suction, 7/8-14 UNF-2B Pressure
N = 3/4 in. 11 Tooth, 1 1/16-12 UN-2B Suction, 7/8-14 UNF-2B Pressure
R = 3/4 in. Str. Keyed, 1 1/16-12 UN-2B Suction, 7/8-14 UNF-2B Pressure

Rear Ports
B = 3/4 in. 11 Tooth, 1 5/16-12 UN-2B Suction, 7/8-14 UNF-2B Pressure
D = 3/4 in. Str. Keyed, 1 5/16-12 UN-2B Suction, 7/8-14 UNF-2B Pressure
F = 3/4 in. 9 Tooth, 1 5/16-12 UN-2B Suction, 7/8-14 UNF-2B Pressure
H = 5/8 in. Str. Keyed, 1 1/16-12 UN-2B Suction, 7/8-14 UNF-2B Pressure
K = 5/8 in. 9 Tooth, 1 1/16-12 UN-2B Suction, 7/8-14 UNF-2B Pressure
M = 5/8 in. Str. Keyed, 1 5/16-12 UN-2B Suction, 7/8-14 UNF-2B Pressure
P = 3/4 in. 11 Tooth, 1 1/16-12 UN-2B Suction, 7/8-14 UNF-2B Pressure
S = 3/4 in. Str. Keyed, 1 1/16-12 UN-2B Suction, 7/8-14 UNF-2B Pressure

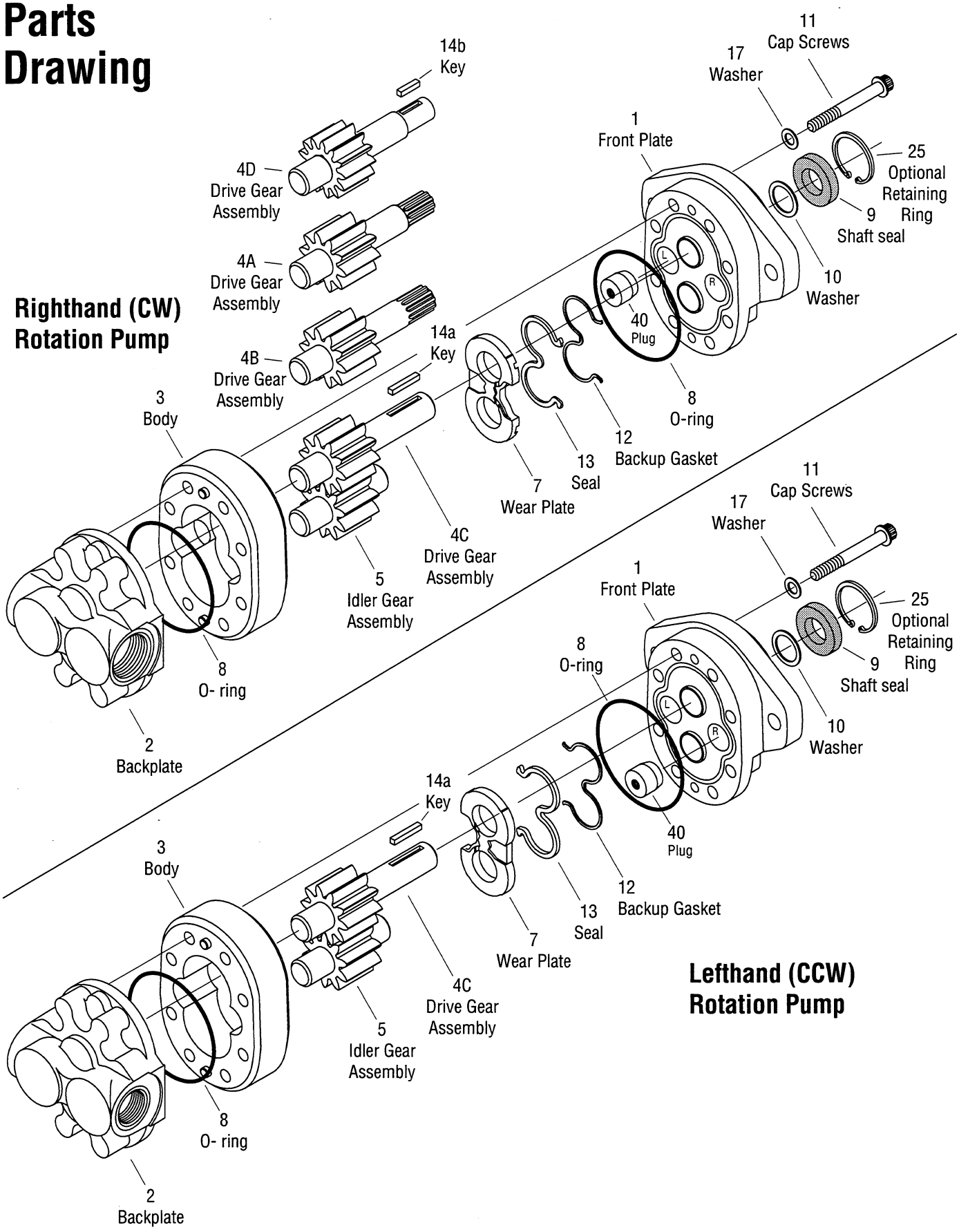
Serial Number Code: B 95 01 31 JB

JB — Testers Initials
31 — Day of Month (two digits)
01 — Month (two digits)
95 — Last two digits of year built. (95 for 1995 etc.)
B — Revision level of parts list.

Required Tools

- 3/8 in. socket and ratchet wrench
- Internal Retaining Ring Pliers (straight .090 tip)
- O-ring Pick
- Thread 3/8 dia. UNC bolt/screw
- Torque Wrench (135.6 N·m [100 lbf·ft] capacity)
- Hammer (soft face)
- Light Petroleum Jelly
- Seal Driver
- Arbor Press

Parts Drawing



Disassembly

Repair Information - Model 26000

Work in a clean area; cleanliness is extremely important when repairing hydraulic pumps. Before disconnecting the lines, clean port area of pump. Disconnect hydraulic lines, removing pump assembly from vehicle and plugging ports. Thoroughly clean the outside of pump. After cleaning, remove port plugs and drain oil.

Disassembly

1 Remove *key* from drive shaft if keyed drive gear assembly is used.

2 Put a *location mark* across front plate, body and backplate to assure proper reassembly.

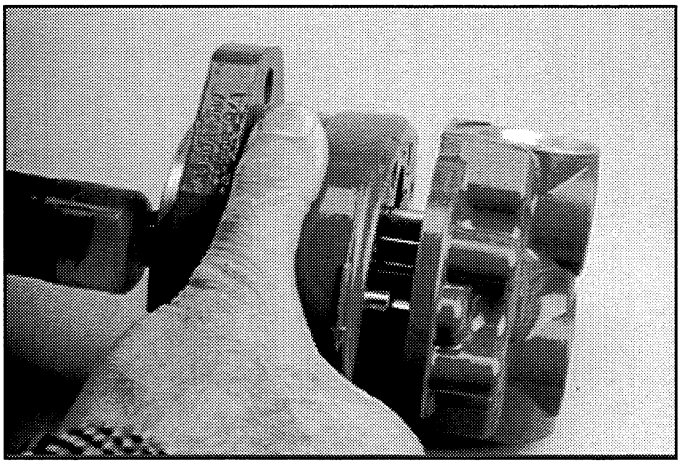
3 Clamp pump in vise, shaft end up.

4 Remove *cap screws* (eight each) and washer (four each).

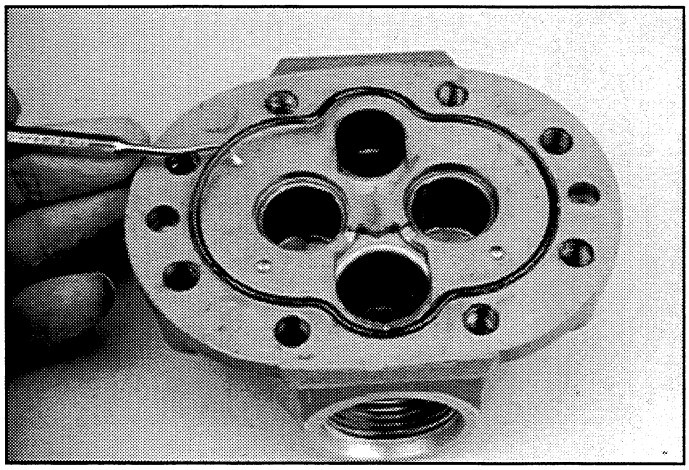
5 Remove pump from vise, hold pump in hands and tap shaft with plastic hammer or rawhide mallet to separate front plate from backplate. Body will remain with either front plate or backplate.

Parts List

Item No.	Description	Qty.
1	Front plate Assembly	1
2	Backplate	1
3	Body Assembly	1
4	Drive Gear Assembly	1
5	Idler Gear Assembly	1
~ 7	Wear Plate	1
~ 8	O-ring	2
~ 9	Shaft Seal	1
~ 10	Washer	1
11	Cap Screw	8
~ 12	Backup Gasket	1
~ 13	Seal	1
14	Key for Straight Shaft	1
~ 17	Washer	4
25	Retaining Ring (optional)	1
40	Plug	1
~ Seal Kit	26000-901 for Single Pumps	



6 Remove *o-ring* seal from backplate.

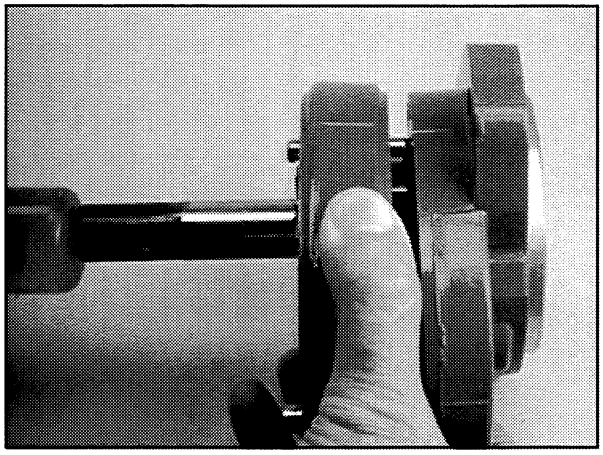


7 To disassemble the *relief valve backplate, flow divider backplate, and tandem flow divider backplate* see page 11 & 12.

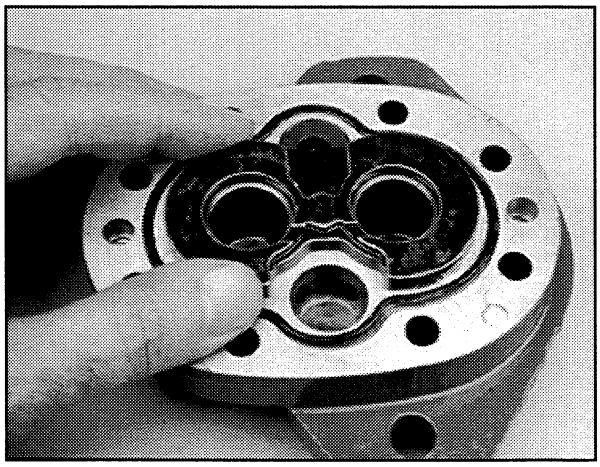
Disassembly

8 Remove *idler gear assembly* from body.

9 To separate *body* from the plate it remained with, place *drive gear assembly* in gear pocket and tap protruding end with plastic hammer or rawhide mallet. Remove drive gear assembly.



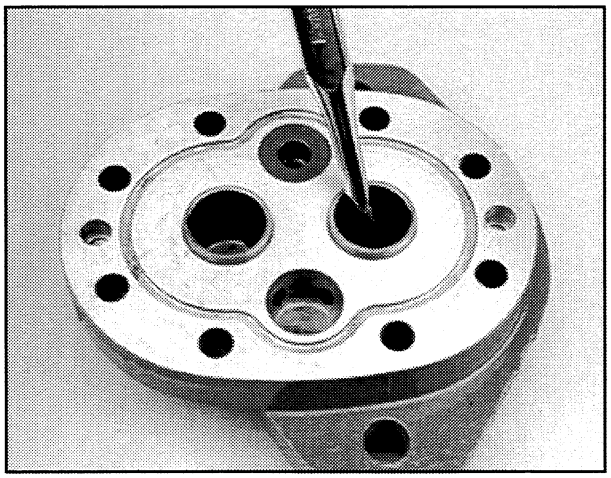
10 Remove wear plate and o-ring seal, noting position of open side of wear plate.



11 Remove *back-up gasket and seal* from wear plate by extracting with a o-ring tool.

12 Remove snap ring (if applicable) from the front of the front plate shaft seal area.

13 Remove *shaft seal* and *washer* from front plate with a blunt punch from the back side.



14 Removing the *plug* in front plate is not necessary, unless you intend to change rotation. See Reversibility - Changing Input Rotation of Pump.

Reversibility

Changing Input Rotation of Pump

1 Place pump in a protected jaw vise with shaft end up. Remove the eight cap screws.

2 Remove front plate, noting orientation of drive shaft through bearing in reference to the backplate.

3 Notice the location of the open side of wear plate and remove wear plate.

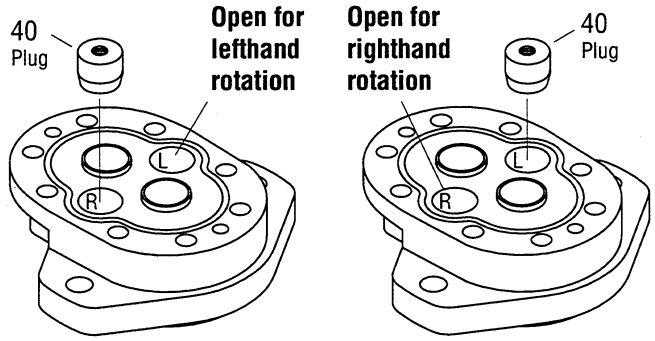
4 Switch *drive gear and idler gear* within gear pockets. Do not flip idler gear end for end.

Note: Gear housing body and backplate do not need altering.

5 Re-install wear plate into gear pockets over the gears with seal and backup gasket up. (Same orientation as removed)

6 Front plate disassembly and assembly:

- Thread 3/8 UNC threaded bolt into *plug* cavity. Start with fingers, then place bolt head in vise and turn front plate to engage threads 2-3 turns.
- Holding bolt in vise, tap front plate with rubber hammer to disengage *plug*.
- Remove *plug* from bolt.
- Install plug in the other casting cavity and tap flush with rubber hammer. Note L or R at bottom of cavity.



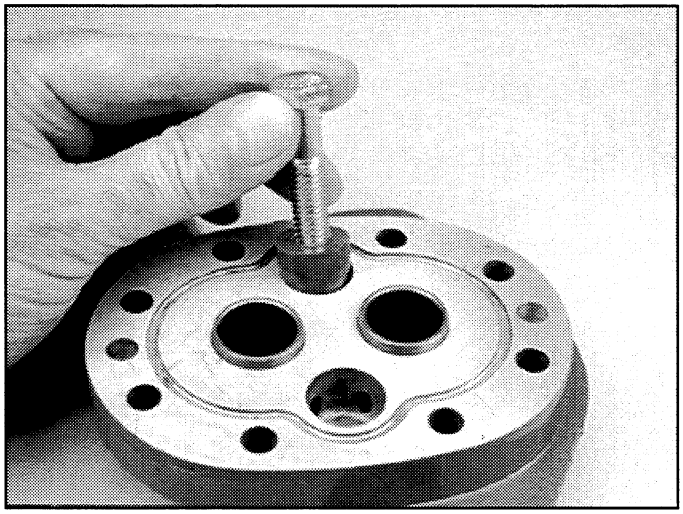
- Ensure that bearing drain holes are free of debris.
- Note proper placement of o-ring in groove of front plate.

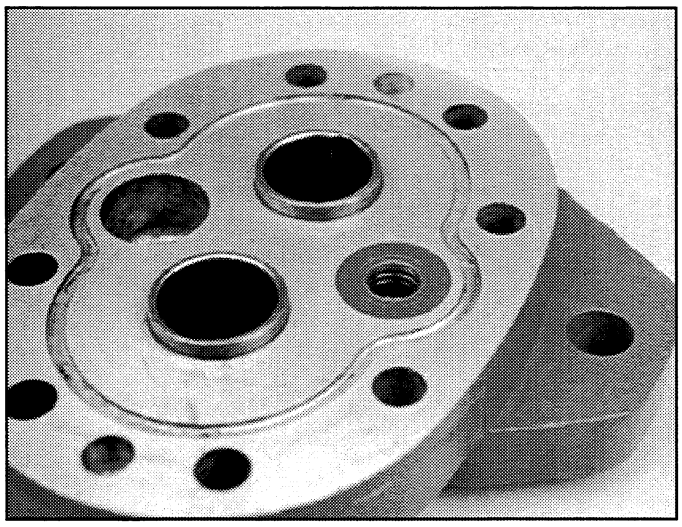
7 Hold o-ring in groove of front plate with petroleum jelly. Reassemble front plate over drive shaft end, being careful not to damage shaft seal.

8 Torque 8 cap screws 34 to 38 N•m [25 to 28 lbf•ft].

9 Lubricate gears and mating surfaces with hydraulic oil through ports.

10 Rotate shaft (manually) to ensure proper assembly of components.





Inspection

Inspect Parts for Wear

General

1 Clean and dry all parts.

2 Remove all nicks and burrs from all parts with emery cloth.

Gear Assembly Inspection

1 Check spline drive shaft for twisted or broken teeth or check keyed drive shaft for broken or chipped keyway.

2 Inspect both the drive gear and idler gear shafts at bushing points and seal area for rough surfaces and excessive wear.

3 Replace gear assembly if shaft measures less than 19 mm [.748 in] in bushing area. (One gear assembly may be replaced separately; shafts and gears are available as assemblies only.)

4 Inspect gear for scoring and excessive wear.

5 Replace gear assembly if gear width is below the following dimensions. Refer to chart on this page.

6 Assure that snap rings are in grooves on either side of drive and idler gears.

7 If edge of gear teeth are sharp, break edge with emery cloth.

Front plate and Backplate Inspection

1 Oil groove in bushings in front plate should be in line with dowel pin holes and 180° apart. The oil grooves in the backplate bushings should be at approximately 37° to the pressure side.

2 Replace the backplate or front plate if I.D. of bushings exceed 19,2 mm [.755 in] (Bushings are not available as separate items).

3 Bushings in front plate should be at 3,20 mm [.126 in] above surface of front plate.

4 Check for scoring on face of backplate. Replace if wear exceeds ,038 mm [.0015 in.].

Body Inspection

1 Check body inside gear pockets for excessive scoring or wear.

2 Replace body if I.D. of gear pockets exceeds 43,7 mm [1.719 in].

Model Number	26001	26002	26003	26004	26005	26006	26007	26008	26009	26010	26011	26012	26013
Pump Disp. cm^3/r [in^3/r]	6,6 [.40]	8,2 [.50]	9,5 [.58]	10,8 [.66]	13,8 [.84]	16,7 [1.02]	19,7 [1.20]	22,5 [1.37]	24,3 [1.48]	25,2 [1.54]	27,7 [1.69]	29,0 [1.77]	30,6 [1.87]
Gear Width mm [in]	7,85 [.309]	9,75 [.384]	11,20 [.441]	12,95 [.510]	16,15 [.636]	19,35 [.762]	22,56 [.888]	25,76 [1.014]	28,12 [1.107]	28,96 [1.140]	32,16 [1.266]	33,78 [1.330]	35,36 [1.392]

Reassembly

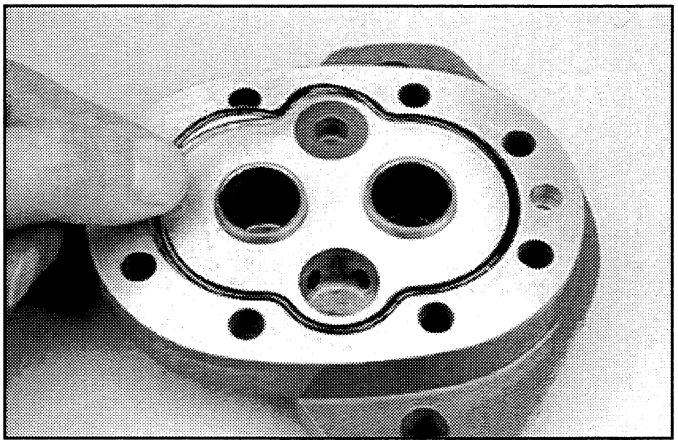
General Information

It is important that the relationship of the backplate, body, wear plate and front plate is correct. You will note two half moon cavities in the body. Note: The smaller half moon port cavity must be on the pressure side of the pump. The side of wear plate with midsection cut out must be on suction side of pump. Suction side of backplate is always side with larger port boss.

Reassembly

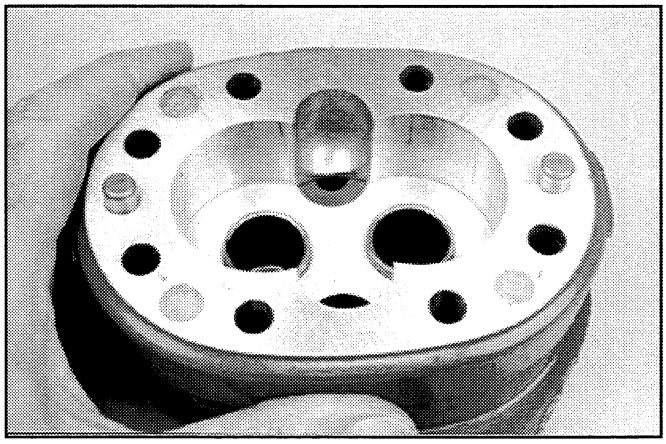
1 During the reassembly replace the *wear plate, seal, back-up gasket, shaft seal and o-rings* as new parts.

2 Install *o-ring* in groove of front plate.

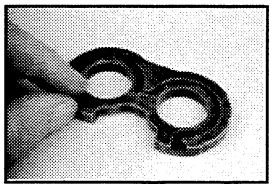


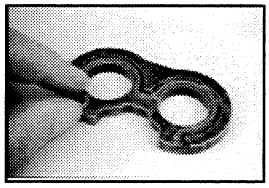
3 Apply a thin coat of petroleum jelly or hydraulic oil to both milled gear pockets of body. Slip body onto front plate with half moon port cavities in body facing away from front plate.

Note: The small half moon port cavity must be on the pressure side (the plugged side of the front plate) of pump.

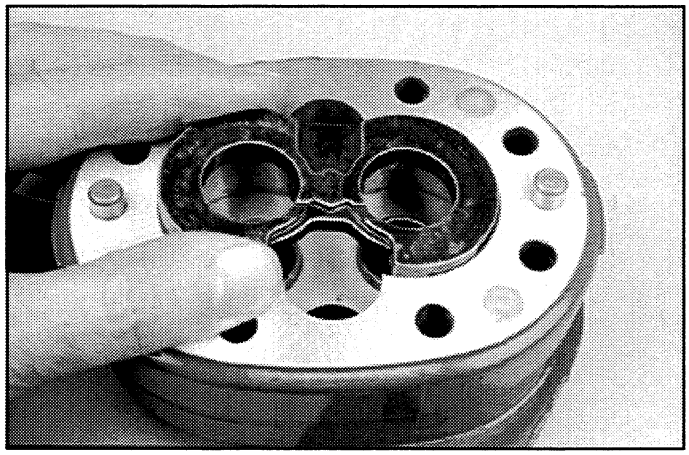


4 Install new *seal* and new *backup gasket* into wear plate. Note in the middle of the backup gasket a flat section or support. This area must face away from the wear plate inside the seal.

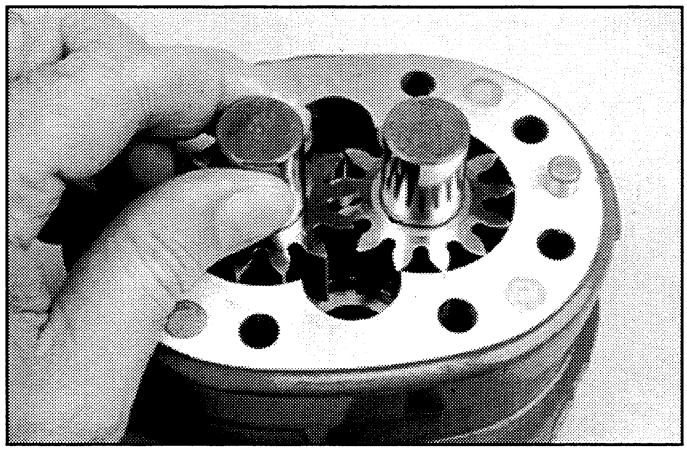




5 Place new *wear plate, seal,* and *backup gasket* into gear pocket with seal and backup gasket next to front plate. The side of the wear plate with the mid section cut-away must be on the suction side of pump.

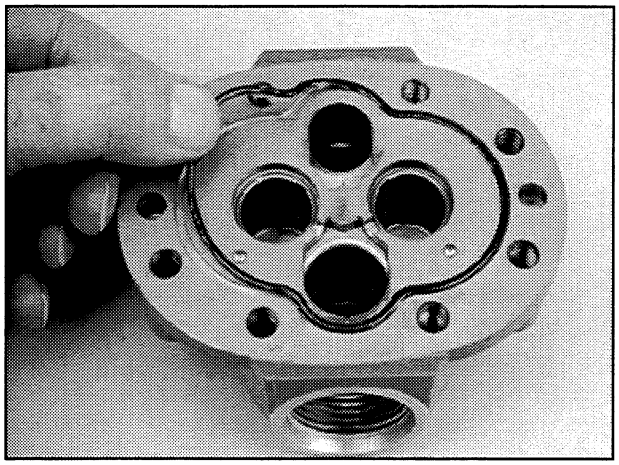


6 Dip *gear assemblies* into oil and slip into front plate bushings and gears into pockets of body.



Reassembly

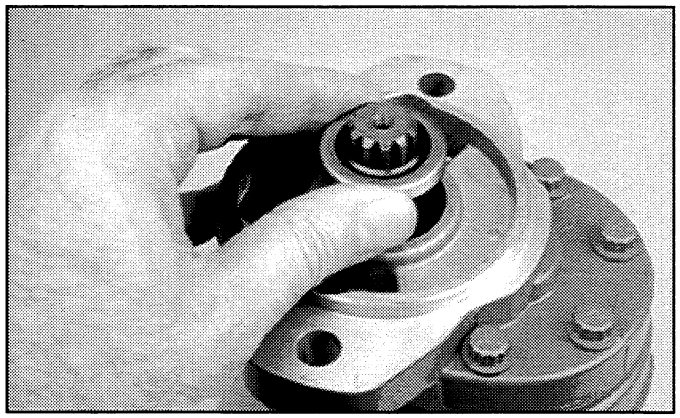
7 Install new *o-ring* in groove of backplate.



8 Make sure port orientation is correct and then slide *backplate* over gear shafts until dowel pins are engaged.

9 Secure with *cap screws* and new *washers*. Tighten cap screws evenly in a crisscross pattern 34 to 38 N•m [25 to 28 lbf•ft] torque.

10 Place washer over drive shaft into housing. Liberally oil shaft seal and install over drive shaft, carefully so that rubber sealing lips are not cut.



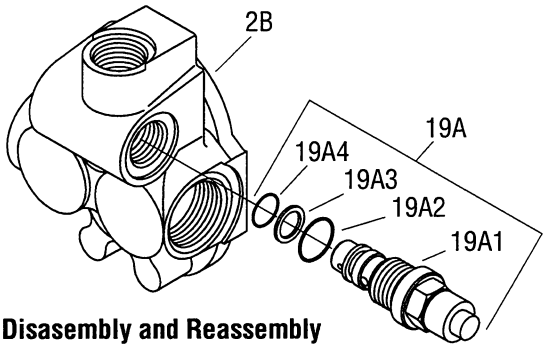
11 Place 1-5/16 in. O.D. sleeve over shaft and press in shaft seal until flush with front surface of front plate.

13 Install key on keyed shaft.

Note: Refer to Start-up Procedure and Trouble Shooting Procedure.

Specific Backplate Parts List

Relief Valve Backplate



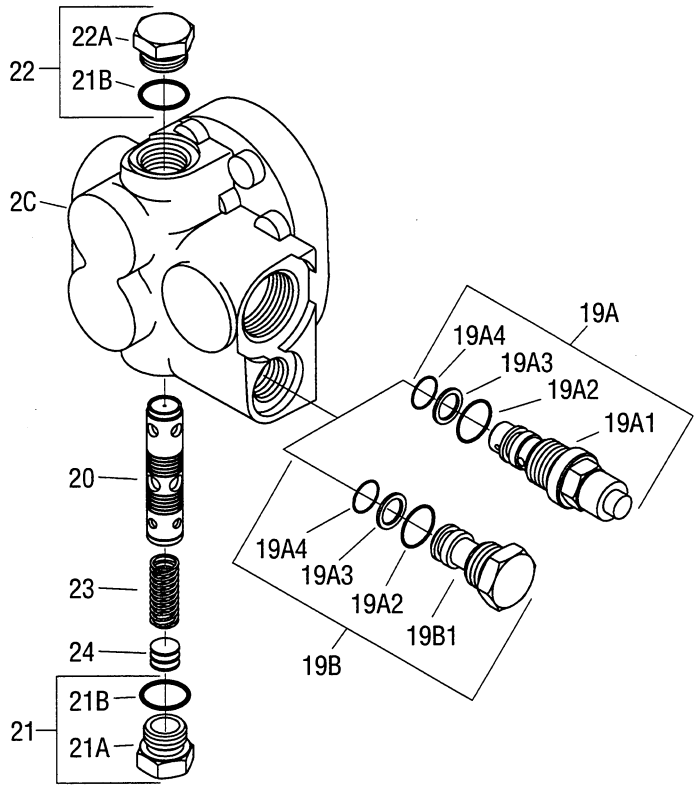
Item No.	Description	Qty.
2	Relief Valve Backplate	1
18	O-ring	3
19A	Relief Valve Assembly	1
19A1	Relief Valve	1
~ 19A2	O-ring	1
~ 19A3	Backup Ring	1
~ 19A4	O-ring	1
19B	Plug Assembly	1
19B1	Plug	1

Disasembly and Reassembly

1 After removing *relief valve*, remove and replace o-rings and backup ring with new parts.

2 Install *relief valve* and torque 41 to 46 N•m [30 to 34 lbf•ft]

Flow Divider Backplate



Item No.	Description	Qty.
2C	Flow Divider Backplate	1
19A	Relief Valve Assembly	1
19A1	Relief Valve	1
~ 19A2	O-ring	1
~ 19A3	Backup Ring	1
~ 19A4	O-ring	1
19B	Plug Assembly	1
19B1	Plug	1
20	Flow Divider Spool	1
21	Plug/O-ring Assembly	1
21A	Plug	1
~ 21B	O-ring	2
22	Plug/O-ring Assembly	1
22A	Plug	1
23	Spring	1
24	Shim (.0239 inch thick)	A/R
A/R	– As Required	

Disasembly and Reassembly

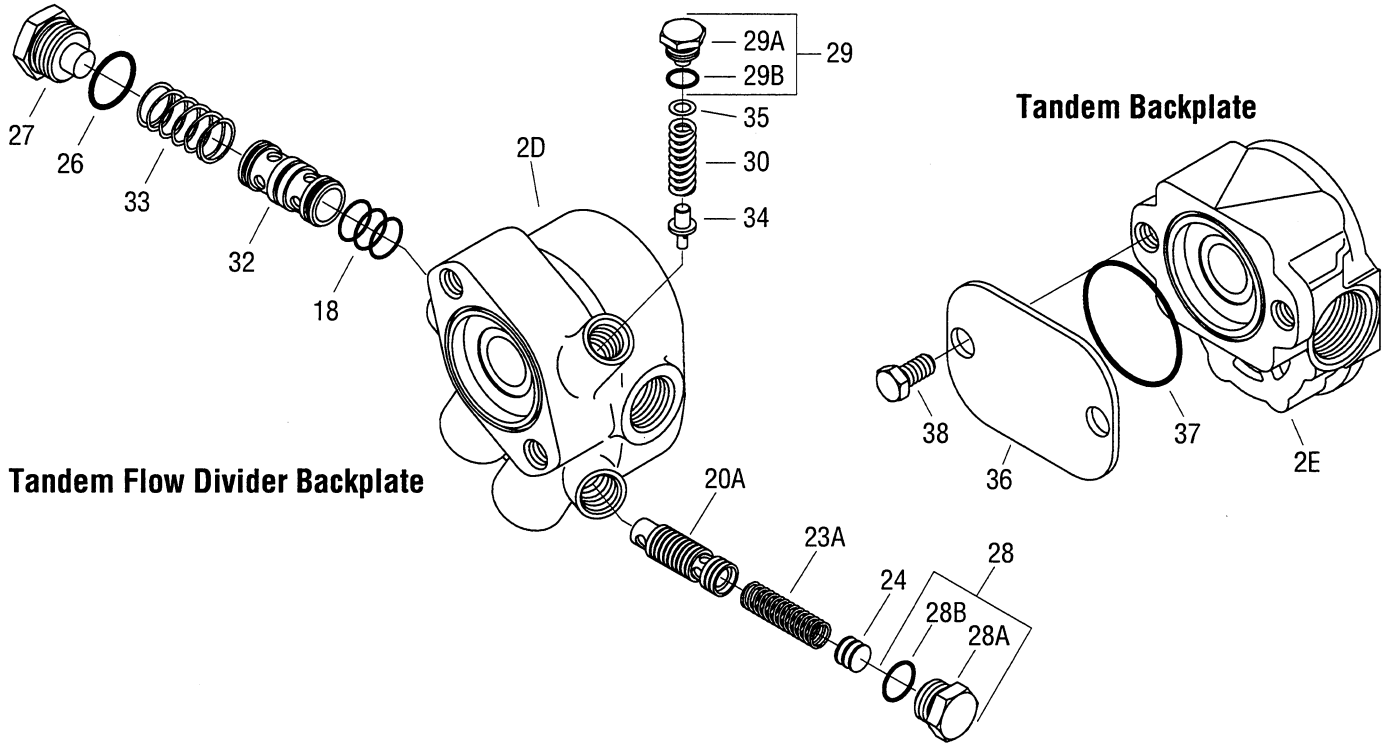
1 After removing *relief valve or plug*, remove and replace o-ring and backup ring with new parts.

2 Install *relief valve or plug* and torque 41 to 46 N•m [30 to 34 lbf•ft]

3 Remove flow divider *plugs, shims, spring, and spool* from backplate. (Notice orientation of spool with cavity in backplate)

4 Install new plug *seals* on plugs. Install *spool, spring, shims, and plug assemblies* into backplate. Torque plugs 29 to 33 N•m [21 to 24 lbf•ft]

Specific Backplate Parts List



Disasembly and Reassembly

1 Remove *relief valve plug, shim, spring, and poppet* from backplate. Do not remove internal relief valve seat. Seat is loctited to a predetermined depth. Remove o-ring from plug and replace with new o-ring.

2 Install *poppet, spring, shim, and relief valve plug* and torque 14 to 16 N•m [10 to 12 lbf•ft]

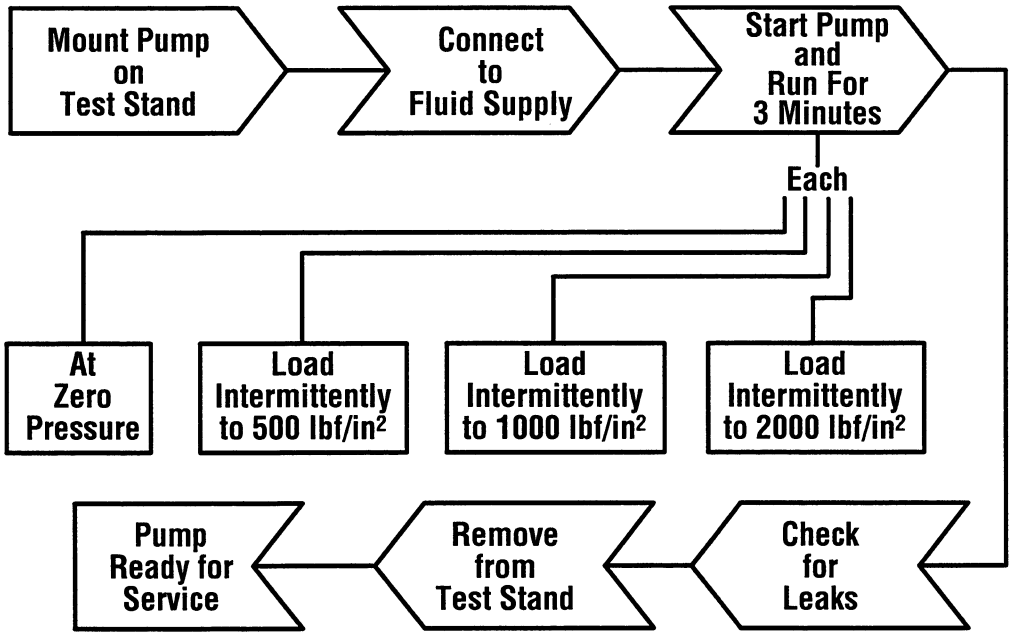
3 Remove flow divider *plugs, shims, springs, spool, and sleeve* from backplate. (Notice orientation of spool with cavity in backplate) Remove *o-rings* from sleeve and replace with new *o-rings.*

4 Install *sleeve, spool, springs, shims, and plug assemblies* into backplate. Torque plug #27 48 to 54 N•m [35 to 40 lbf•ft] and plug #28 29 to 33 N•m [21 to 24 lbf•ft]

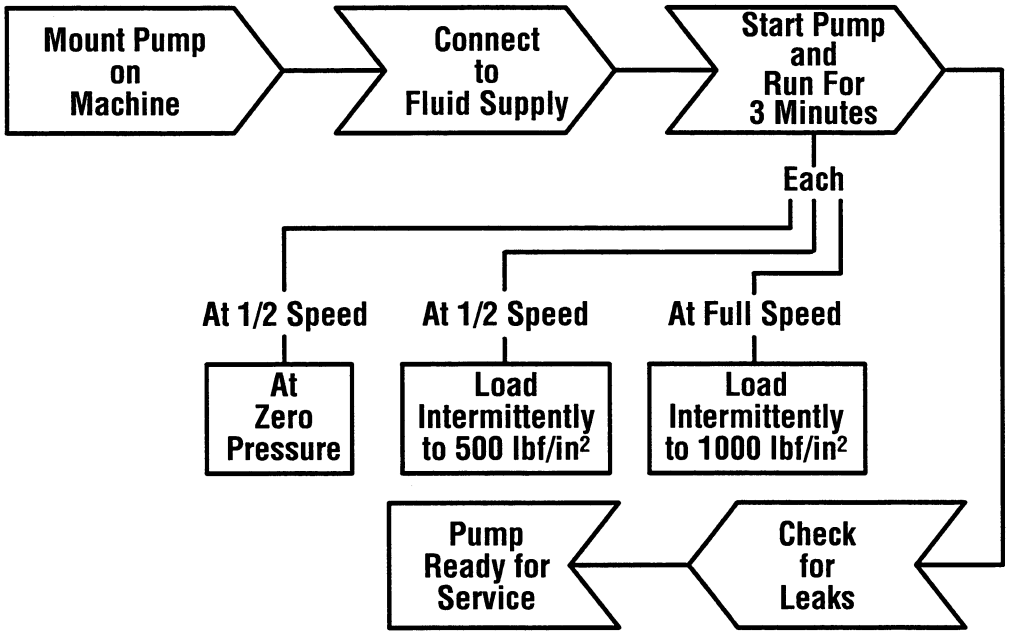
Item No.	Description	Qty.
2D	Tandem Flow Divider Backplate	1
2E	Tandem Backplate	1
18	O-ring	3
20A	Spool for Tandem Flow Divider Backplate	
23A	Spring for Tandem Flow Divider Backplate	1
24	Shim (.0239 inch thick)	A/R
~ 26	O-ring	1
27	Plug	1
28	Plug/O-ring Assembly	1
28A	Plug	1
~ 28B	O-ring	2
29	Plug/O-ring Assembly	1
29A	Plug	1
~ 29B	O-ring	1
30	Relief Valve Spring	1
32	Sleeve	1
33	Spring	1
34	Poppet	1
35	Shim Washer (.010 inch thick)	A/R
36	Tandem Cover Plate	1
37	O-ring	1
38	Cap Screw	2
A/R	– As Required	

Placing Series 26 Gear Pump Back into Operation

When test stand is *available*.



When test stand is *not available*.



Trouble Shooting

Problem	Possible Cause	Correction
Cavitation	a. Oil too heavy. b. Oil filter plugged. c. Suction line plugged or too small.	a. Change to proper viscosity b. Clean filter. c. Clean line and check size of line.
Oil heating	a. Oil supply low. b. Contaminated oil. c. Setting of relief valve too high or too low. d. Oil in system too light.	a. Fill reservoir. b. Drain reservoir and refill with clean oil. c. Set to correct pressure. d. Drain reservoir and refill with proper viscosity oil.
Shaft seal leakage	a. Worn shaft seal. b. Worn shaft in seal area. c. Debris in shaft seal suction side drain holes.	a. Replace shaft seal. b. Replace drive assembly. c. Disassemble pump and inspect.
Foaming oil	a. Low oil level b. Air leaking into suction line c. Wrong kind of oil.	a. Fill reservoir. b. Tighten fittings. c. Drain and fill reservoir with non-foaming oil.

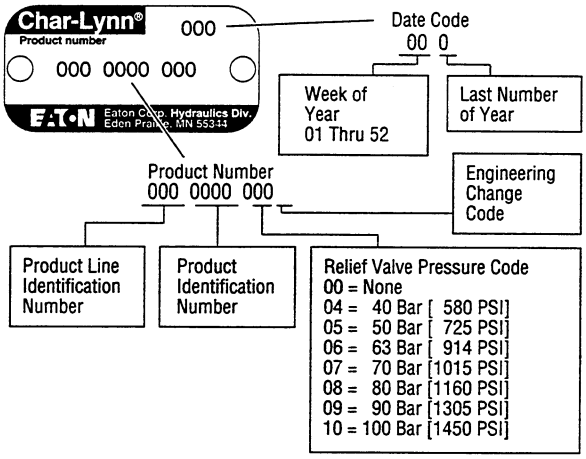
How to Order Replacement Parts

Each Order Must Include the Following:

1. Product Number
2. Date Code
3. Part Name
4. Part Number
5. Quantity of Parts

For More Detailed Information Contact Eaton Corp. Hydraulics Division 15151 Highway 5 Eden Prairie, MN 55344.

- Specifications and performance Data, Catalog No. 11-872
- Replacement Part Numbers and Kit Information — Parts Information No. 7-310.



Eaton Corporation
Hydraulics Division
15151 Hwy. 5
Eden Prairie, MN 55344
Telephone 612/937-9800
Fax 612/937-7130

Eaton Ltd.
Hydraulics Division
Glenrothes, Fife
Scotland, KY7 4NW
Telephone 44/592-771-771
Fax 44/592-773-184

Form No. 7-310

Notes

Order parts from 6-634 Parts Information booklet.
Each order must include the following information.

1. Product and/or Part Number
2. Serial Number Code
3. Part Name
4. Quantity

Eaton Corporation
Hydraulics Division
15151 Hwy. 5
Eden Prairie, MN 55344
Telephone 612/937-9800
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Eaton Ltd.
Hydraulics Division
Glenrothes, Fife
Scotland, KY7 4NW
Telephone 44/1-592-771-771
Fax 44/1-592-773-184

Form No. 7-624

CONTENTS

GAS ENGINE SERVICE MANUAL

ROBIN EH30, EH34
TENNANT Part Number 371585

INTRODUCTION

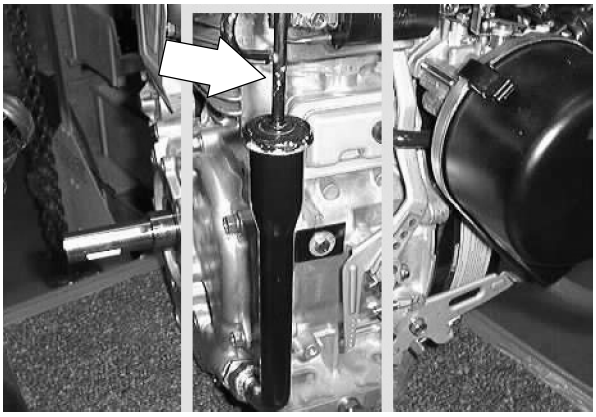
This section includes repair information on the engine and related systems, such as fuel, electrical, and drive belts. Also, engine removal and installation.

This section includes information on the gas and LP engines.

LUBRICATION

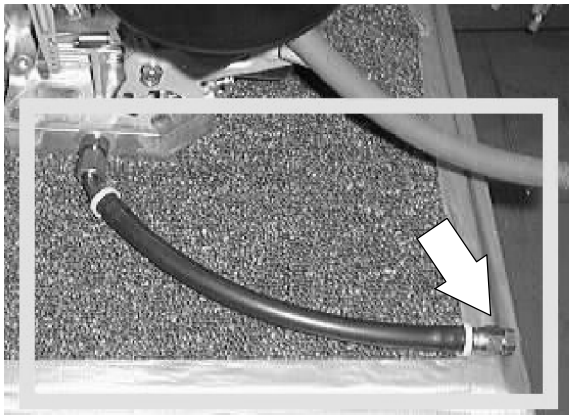
ENGINE OIL

Check the engine oil level daily. The engine oil dipstick can be accessed by lifting up the engine cover. Change the engine oil and oil filter after every 100 hours of machine operation. Use 10W30 SAE-CD/SE rated engine oil.



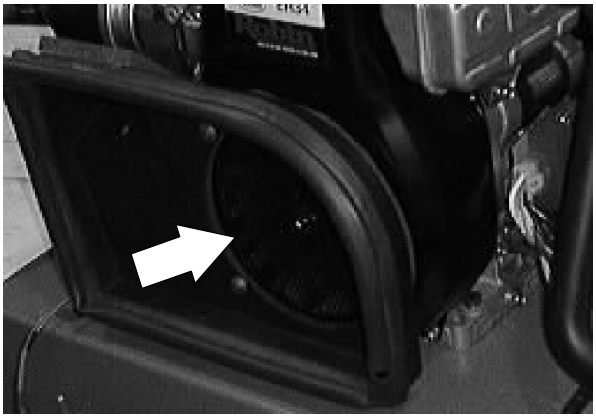
ENGINE OIL DRAIN

The engine oil drain hose is located at the front of the engine. Access the drain hose by opening the left hand brush door.



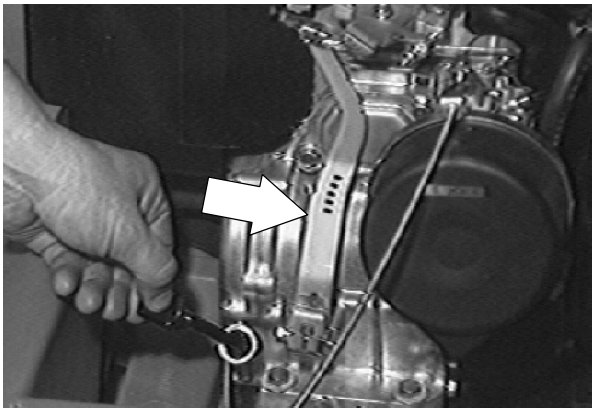
COOLING SYSTEM

The engine on the model 6100G/LP uses a forced air cooling system. Every 100 to 200 hours the blower housing on the engine should be removed so the area between the cooling fins can be clean of any dirt or debris.



GOVERNOR

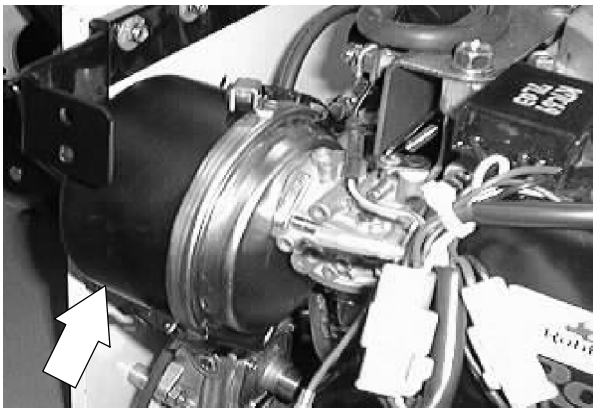
The governor on the model 6100G/LP is an internal mechanical style using a centrifugal flyweight system. It requires no regular maintenance or adjustment.



AIR INTAKE SYSTEM

AIR FILTER

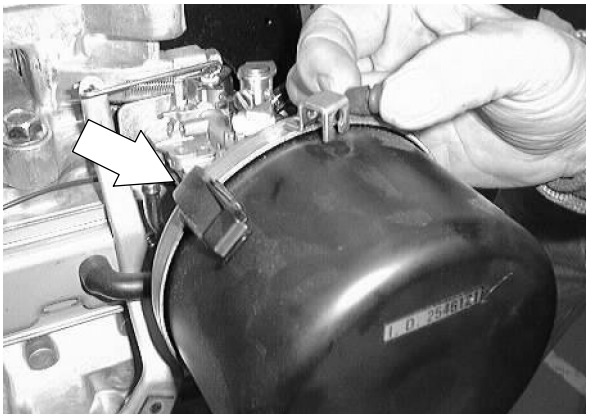
The engine air filter housing has a dust cap and a dry cartridge-type air filter element. Empty the dust cap daily. Check the dust cap every 100 hours of operation to make sure it is expelling dust. Replace the dust cap if the rubber is worn.



The air filter element must be replaced whenever it is damaged or has been cleaned three times.

Do not remove the air filter element from the housing unless it is restricting air flow.

To clean the filter element, remove it from the filter housing. Carefully clean the end cap and the interior of the housing with a damp cloth. Clean the housing sealing surfaces.



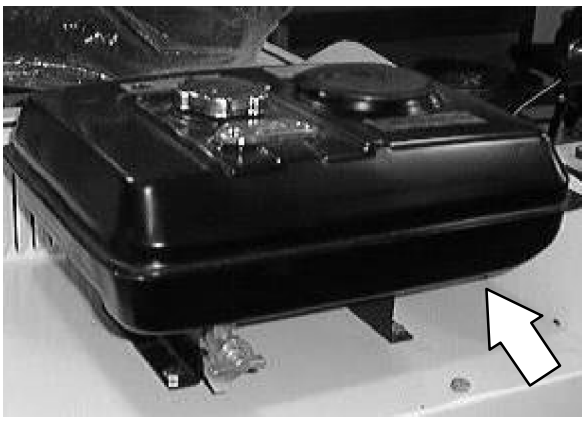
Using an air hose, direct clean, dry air, maximum 205 kPa (30 psi), up and down the pleats on the inside of the element. Do not rap, tap or pound dust out of the element.

FOR SAFETY: When Servicing Machine, Wear Eye And Ear Protection When Using Pressurized Air Or Water.

After cleaning the air filter element, inspect it for damage by placing a bright light inside. The slightest rupture requires replacement of the element. Inspect the seals on the ends of the element, they should be flexible and undamaged.

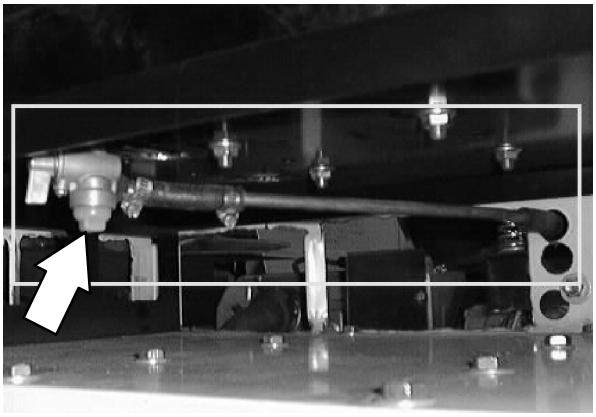
FUEL SYSTEM - GASOLINE

The gas fuel system on the model 6100G/LP is a gravity feed type. There is no fuel pump on this engine. The fuel tank holds 6.0 liters (1.59 gallons).



FUEL SEDIMENT BOWL

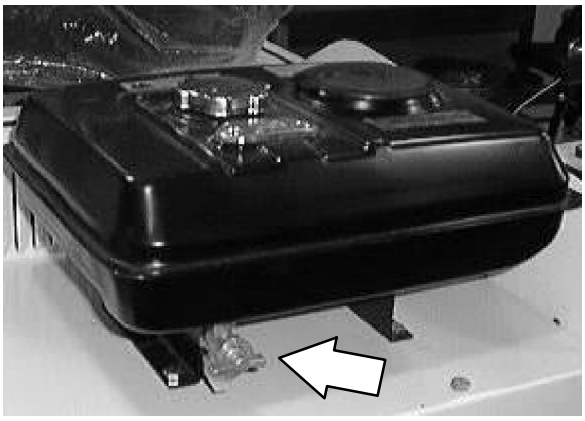
The engine on the model 6100G/LP does not have an in-line fuel filter. This engine is equipped with a sediment bolt at the fuel tank shut-off valve. Clean the sediment bowl every 100 to 200 hours.



TO CLEAN FUEL TANK SEDIMENT BOWL

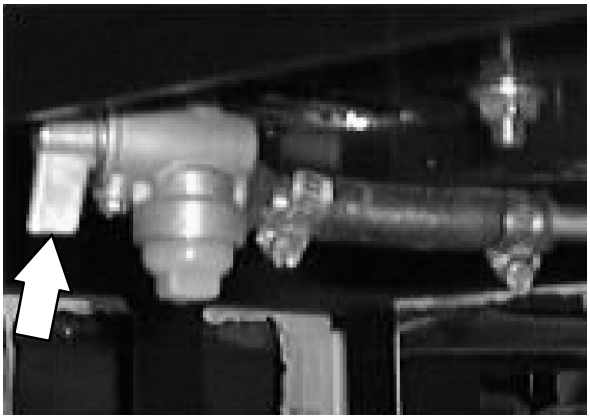
FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set parking brake.

1. Locate the fuel tank sediment bowl under the fuel tank at the back of the machine.



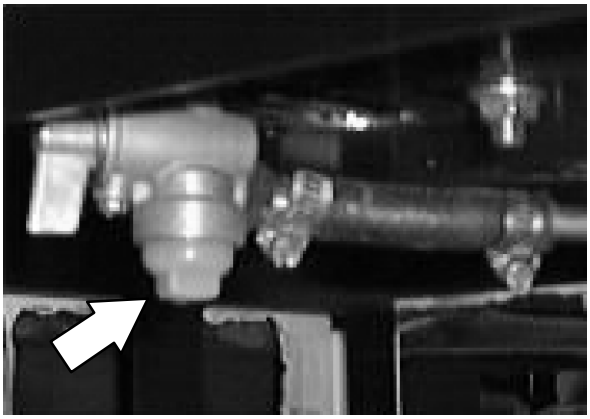
2. Turn the shut-off valve at the fuel tank to the closed position.

3. Start the engine and let it run until all of the gas is used in the fuel line and carburetor.

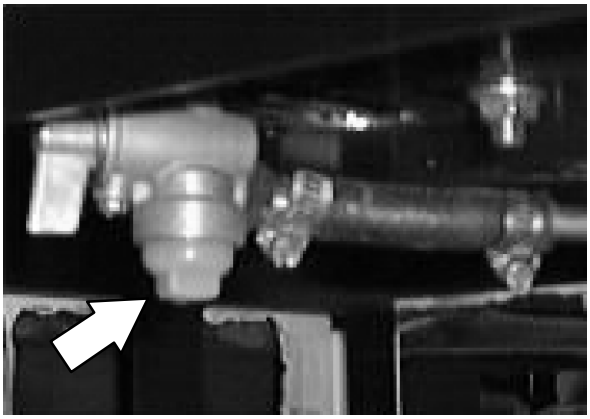


4. Remove the sediment bowl from the bottom of the fuel tank shut-off valve.

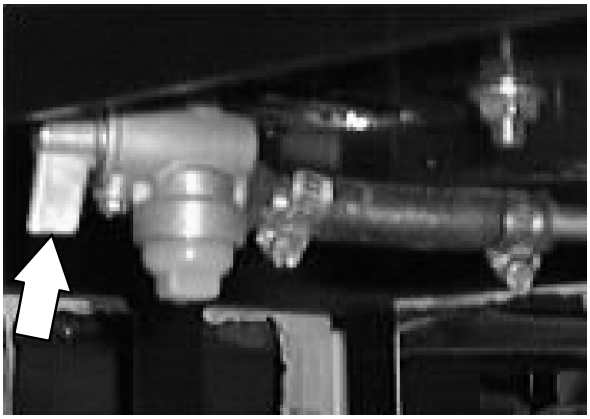
5. Clean any dirt or residue out of the sediment bowl.



6. Reinstall the sediment bowl on the fuel tank shut-off valve. Tighten firmly--but do not over tighten.



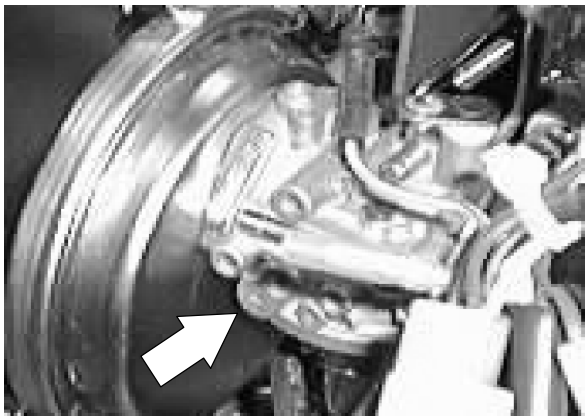
7. Turn the fuel tank shut-off valve to the open position.



8. Start the engine and check the sediment valve for any leaks.

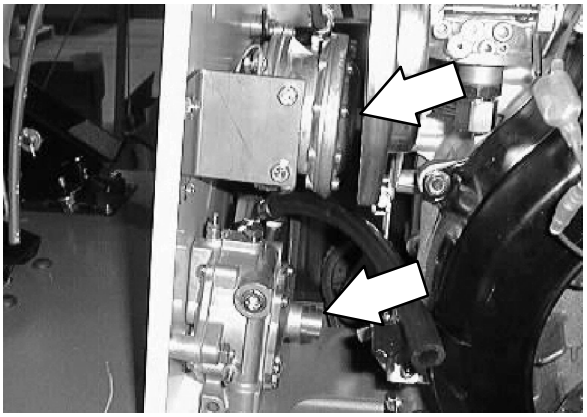
GAS CARBURETOR

The gas carburetor is a horizontal draft, float type. Use an automobile grade of gasoline for best performance. This carburetor should not need to be adjusted. Remove, disassemble, and clean the carburetor every 500 to 600 hours.



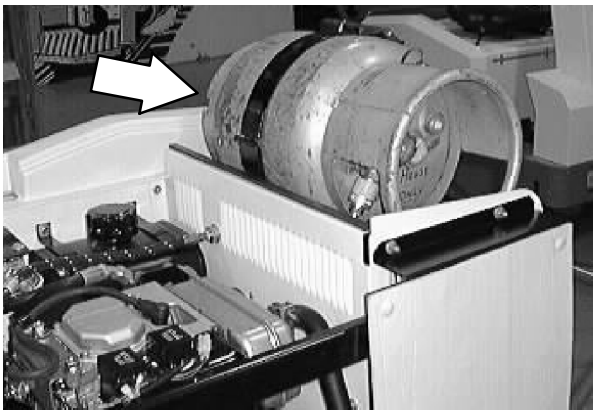
FUEL SYSTEM - LPG

The model 6100G/LP uses a liquid withdrawal type LP system. This system also includes an LP lock-off valve and a LP fuel vaporizer. The carburetor is similar to the one used on the gas machine except for a few internal modifications.



LP FUEL TANK

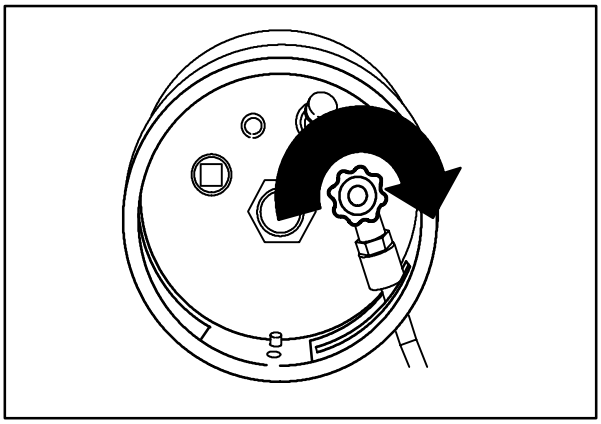
The standard LP tank is a 20lb Vapor withdrawal type.



TO CHANGE LPG FUEL TANK

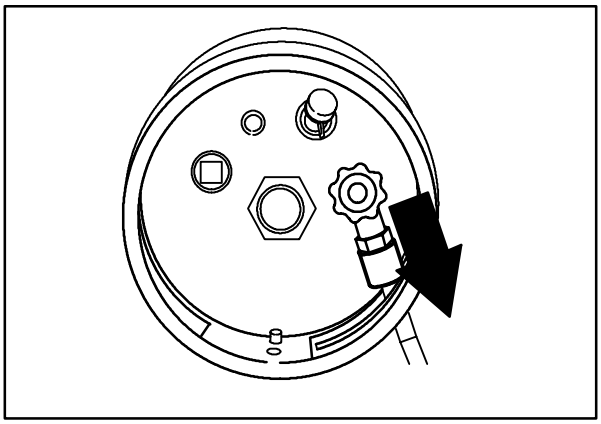
FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set parking brake.

1. Close the valve on the LP tank.

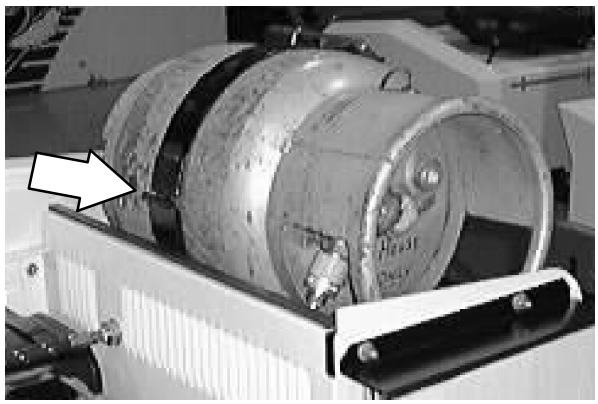


2. Run the engine until all of the LP gas has been used up in the fuel lines.

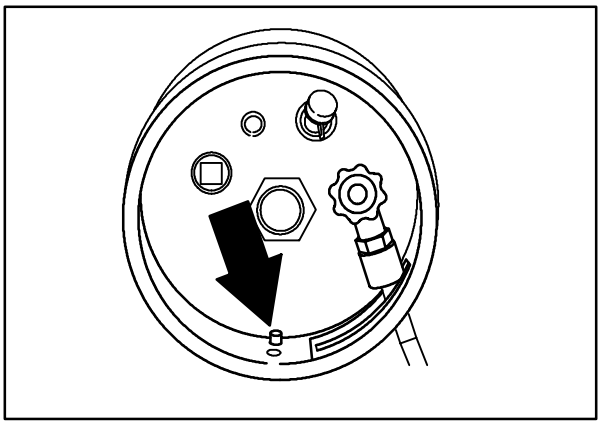
3. Disconnect the coupler at the tank outlet.



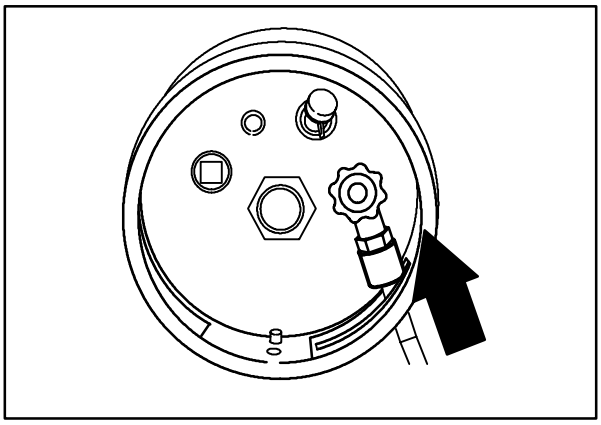
4. Lift up on the lock clamp on the tank strap.



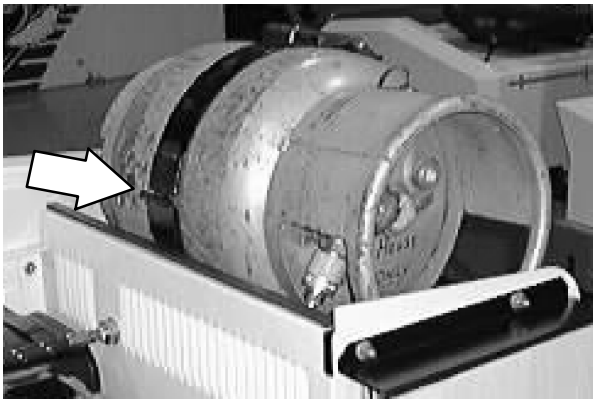
5. Open the tank strap. Remove the LP tank from the machine.



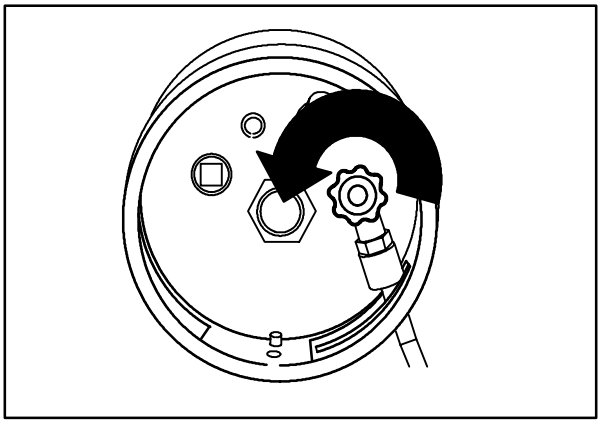
6. Install a full LP tank with the connection on the liquid withdrawal valve.



7. Position the tank strap over the tank and snap the lock clamp.



8. Re-connect the LP coupler on the tank valve. Turn on the valve.



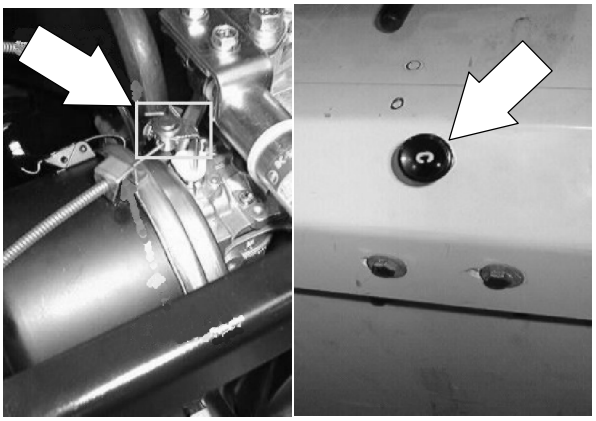
9. Start the engine and check the coupler for leaks.

ENGINE CHOKE KNOB

An engine choke knob is standard equipment on all gas powered machines.

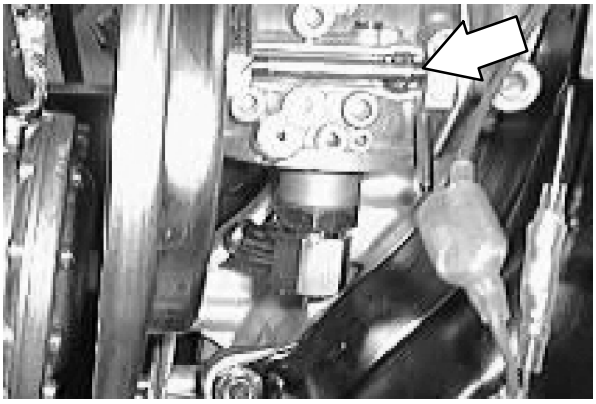
On: For cold starting, pull the engine choke knob out.

Off: Push the choke knob in.



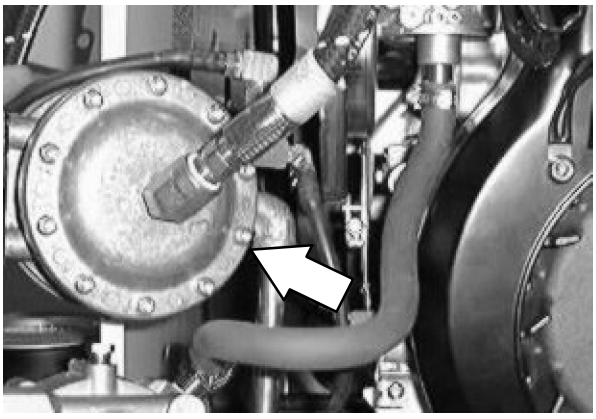
LP CARBURETOR

The carburetor is similar to the one used on the gas machine except for a few internal modifications. A choke mechanism is also employed on this carburetor. It is recommended that the choke be pulled about half way closed for optimum starting. There are no external adjustments on the LP carburetor.



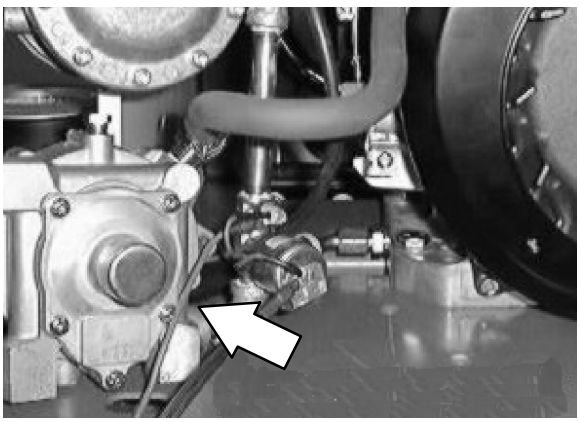
LP LOCK-OFF/FILTER

The LP lock-off/filter is mounted near the back of the engine. The fuel line from the LP tank runs to the inlet port on the lock-off/filter. The outlet port on the lock-off is connected to the inlet port on the LP regulator. The lock-off/filter functions include removing impurities from the LP gas and stopping the flow of LP gas when the engine is not running.



LP VAPORIZER

The LP regulator is mounted near the back of the engine. The inlet port on the regulator is connected to the outlet port of the lock-off/filter. The outlet port on the regulator is connected by hose to the LP carburetor. The LP regulator senses engine vacuum and controls the amount of LP fuel that flows to the carburetor. The LP regulator is non-adjustable.

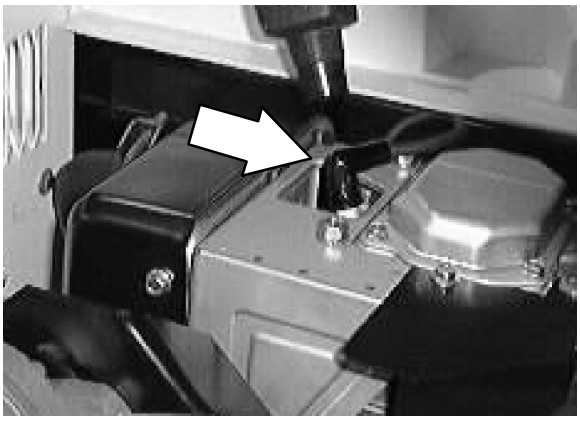


IGNITION SYSTEM

SPARK PLUG

Replace, or clean and set the gap of the spark plug after every 200 hours of use.

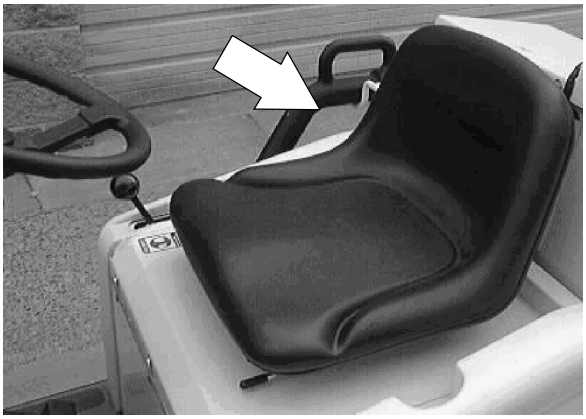
The proper spark plug gap is 0.75 mm (0.03 in).



TO REPLACE SPARK PLUG

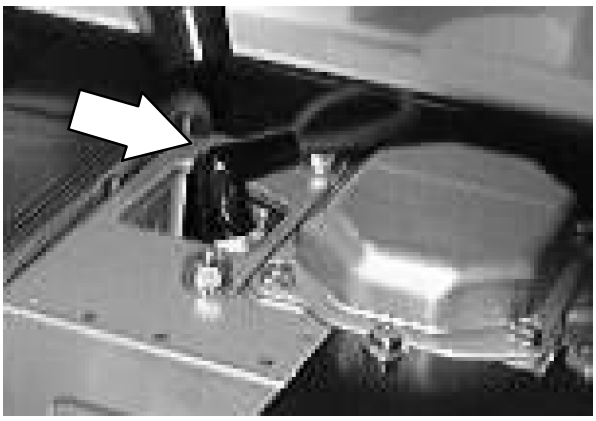
FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set parking brake.

1. Pivot the seat support open and engage the prop rod.



2. Remove the spark plug wire from the spark plug.
3. Use a spark plug wrench to loosen and remove the plug.
4. Clean any dirt from the area around the spark plug opening.
5. Install the new spark plug. Tighten firmly.
6. Reconnect the spark plug wire.
7. Disengage the prop rod and close the seat support.
8. Clean or replace the spark plug every 200 hours:

   GAS: Replace with NGK B-4ES
   LPG: Replace with NGK B-6VX

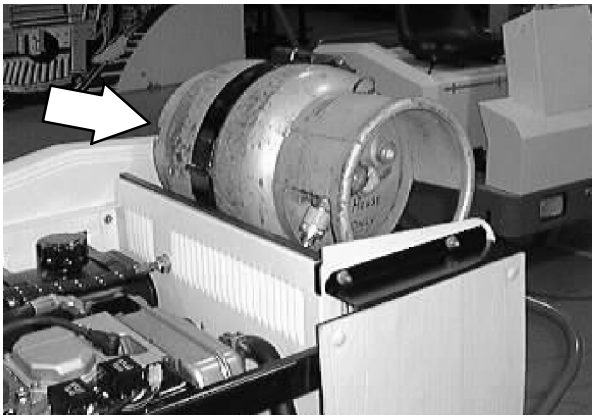


TO REMOVE ENGINE

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set parking brake.

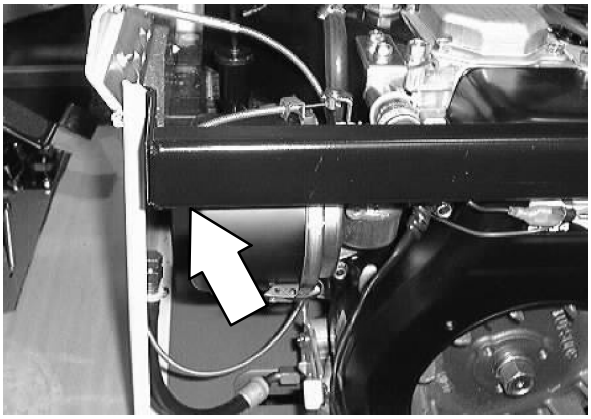
1. Pivot the seat support open and engage the prop rod.

2. LP MACHINE: Remove the LP tank and mounting brackets.

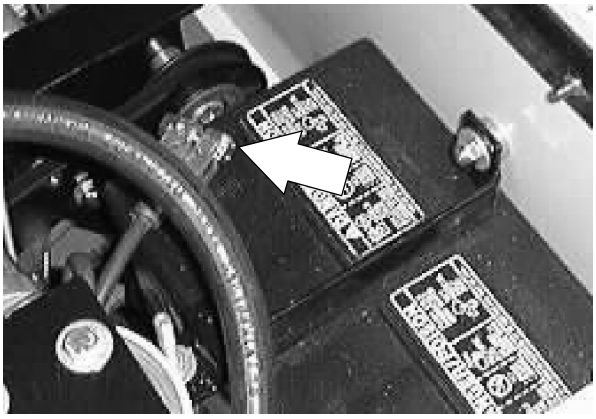


3. Remove the left hand side panel.

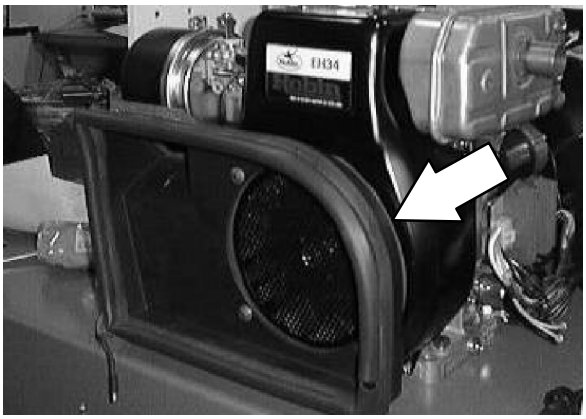
4. Remove the left hand side brace from the machine.



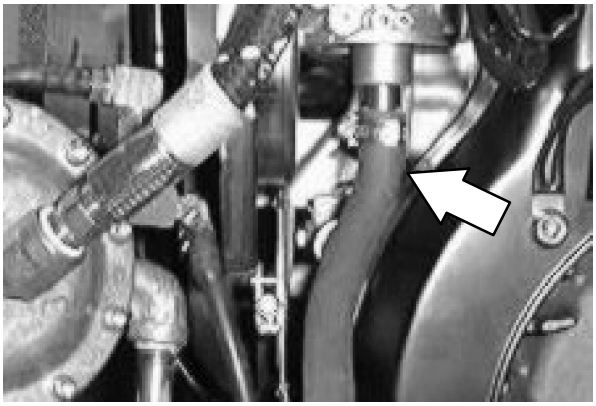
5. Disconnect the battery cables.



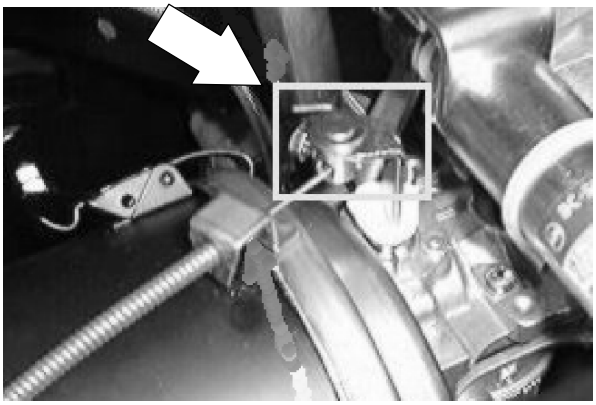
6. Remove the air duct baffle assembly from the left side of the engine.



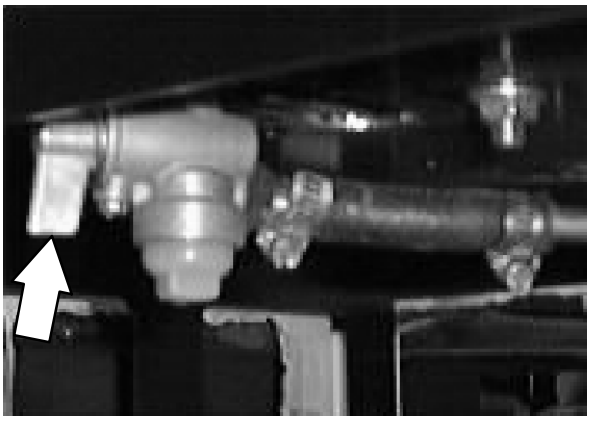
7. LP MACHINE: Disconnect the LP fuel line and vacuum line at the engine carb.



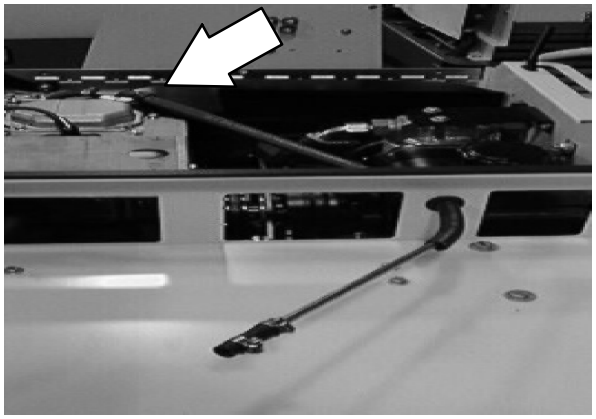
8. Disconnect the choke cable at the carburetor.



9. Shut the fuel valve off at the gas tank.

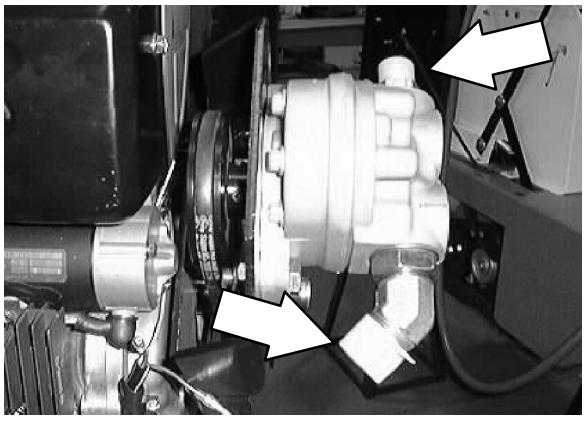


10. Disconnect the fuel line at the carb.

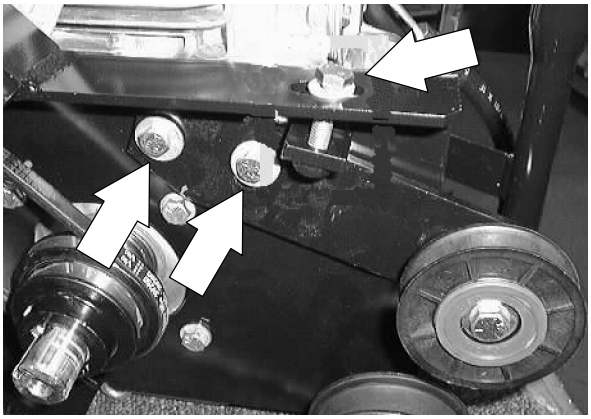


11. Mark, disconnect, and plug the two hoses leading to the hydraulic pump.

NOTE: Observe hydraulic cleanliness requirements when opening hydraulic lines.

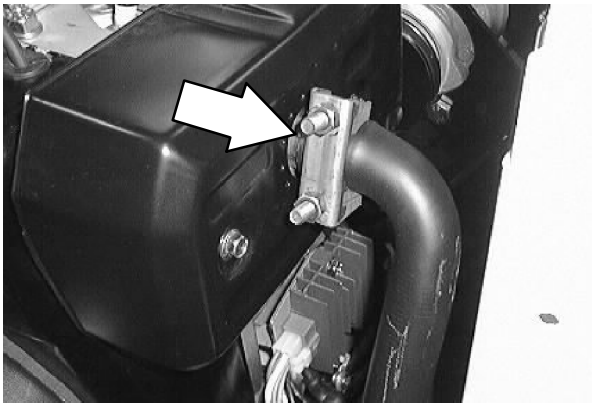


12. Loosen the idler sheave for the jackshaft V-belt. Remove the V-belt from the drive sheave on the engine and idler sheave.

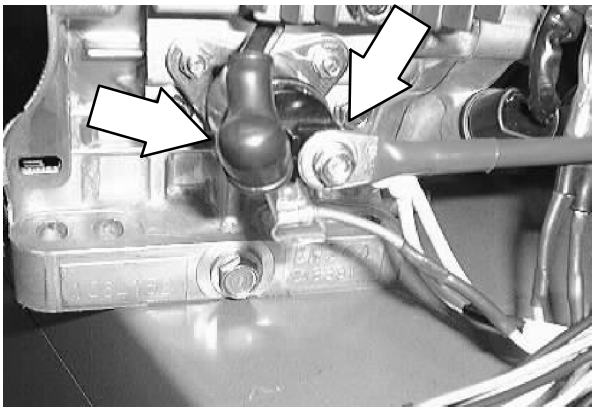


13. Disconnect the exhaust pipe from the muffler at the engine.

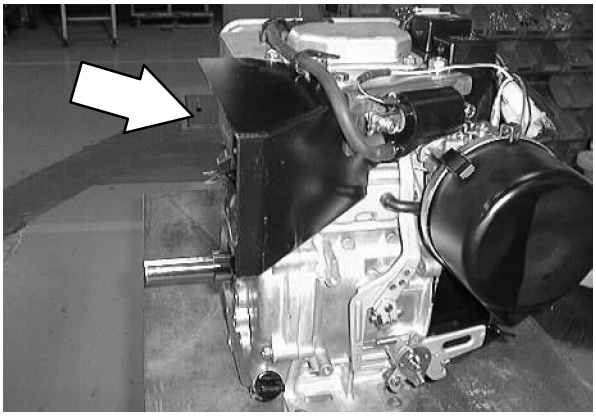
14. Remove the four engine mount bolts.



15. Disconnect two alternator wires, two low oil pressure switch wires, one solenoid wire, one ground cable, and a positive battery cable from the back of the engine.



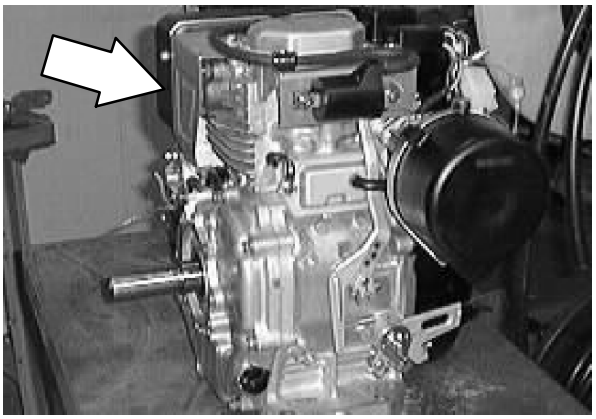
16. The engine can now be removed from the machine.



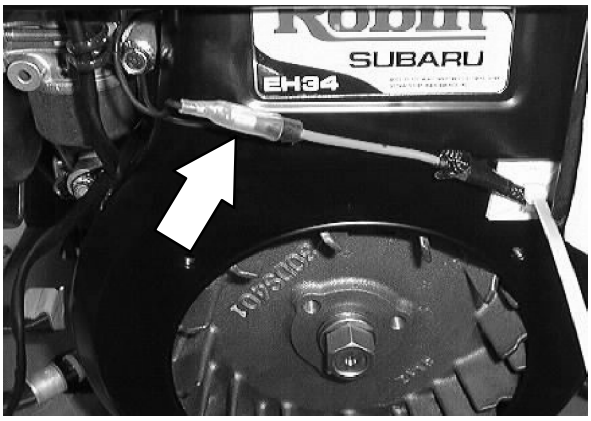
TO INSTALL ENGINE

FOR SAFETY: Before Leaving Or Servicing Machine; Stop On Level Surface, Set parking brake.

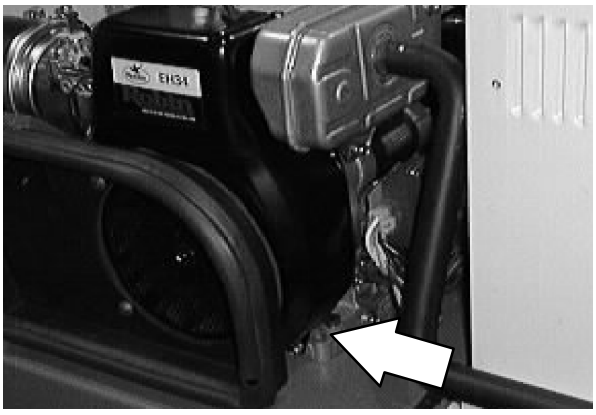
1. Position the engine in the machine.



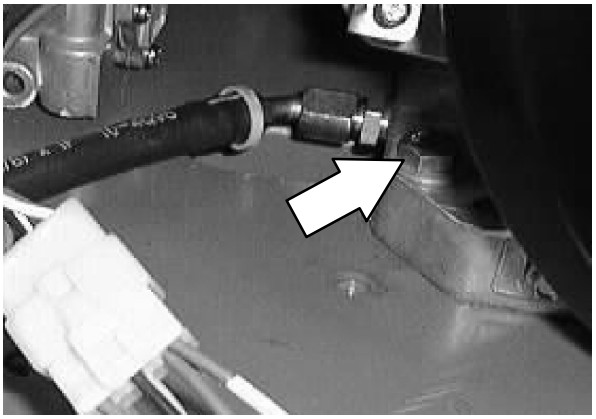
2. Reconnect the alternator wires, low oil pressure switch wires, solenoid wire, and the positive battery cable on the back of the engine. See schematic in the ELECTRICAL section.



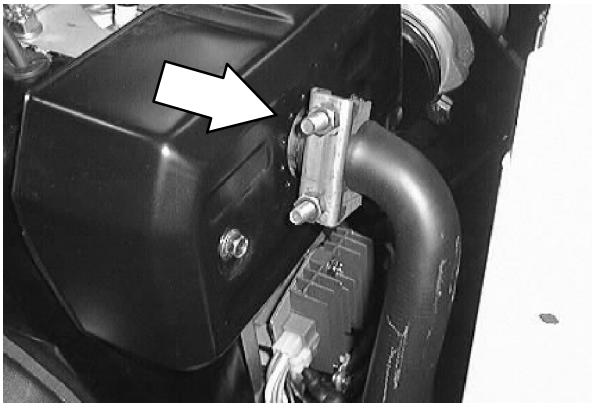
3. Line up the four mount holes on the engine block with the mount holes in the machine frame.



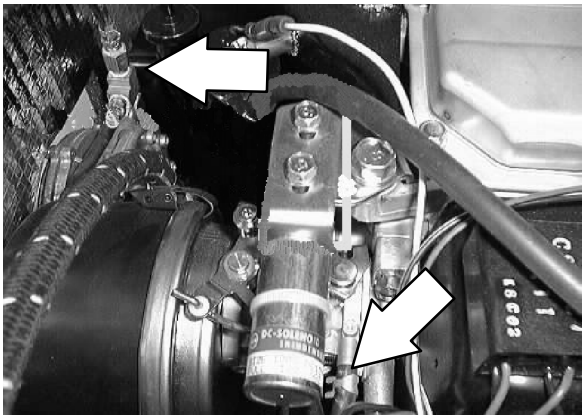
4. Install the four engine mount bolts. *The longer bolt goes into the right, rear mount hole.* Make sure the ground cable and ground wires are positioned under the left, rear mounting bolt. Tighten to 37 – 48 Nm (26 – 34 ft lb).



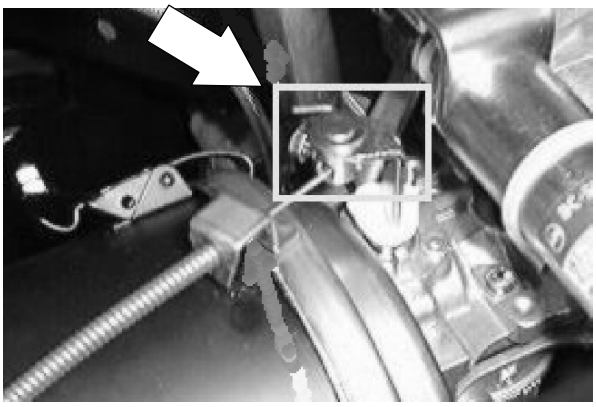
5. Install the exhaust pipe onto the muffler at the engine.



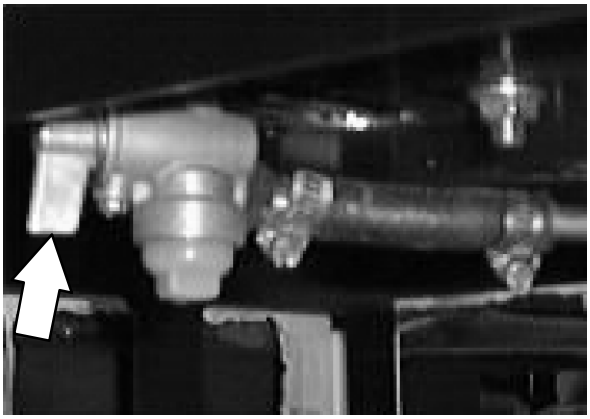
6. LP MACHINE: Reconnect the vacuum line and LP fuel line to the carb.



7. Reconnect the choke cable at the carburetor.

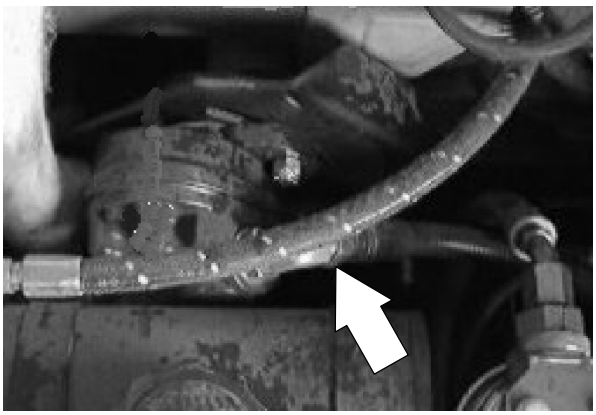


8. Reconnect the fuel line at the carb and open the valve at the gas tank.

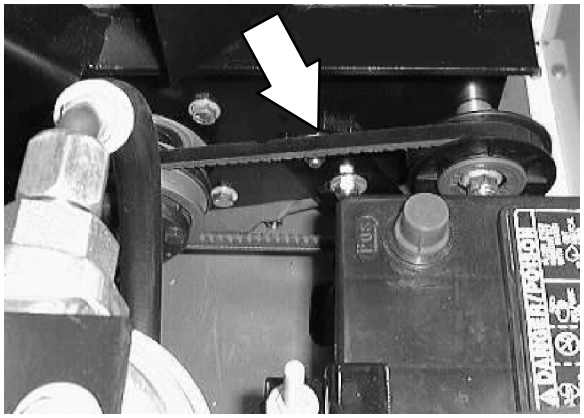


9. Reconnect the two hoses to the hydraulic pump. See schematic in the HYDRAULIC section.

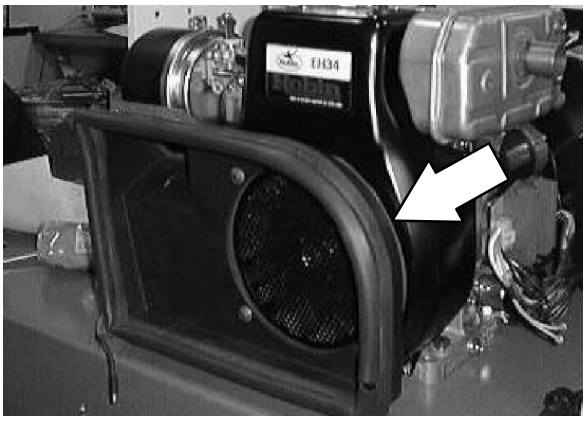
NOTE: Observe hydraulic cleanliness requirements when opening hydraulic lines.



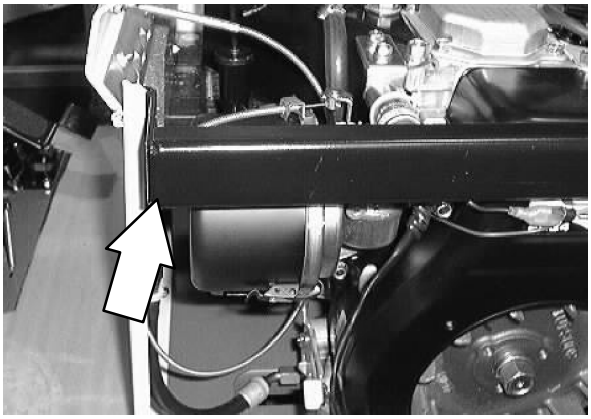
10. Reinstall the jackshaft V-belt onto the sheave on the engine and the two idler sheaves. Pull the idler tight and tighten the hardware.



11. Reinstall the air duct baffle assembly onto the left side of the engine.

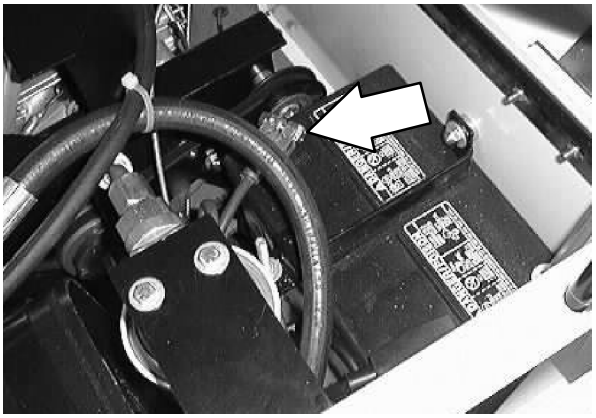


12. Reinstall the left hand side brace onto the machine panels.

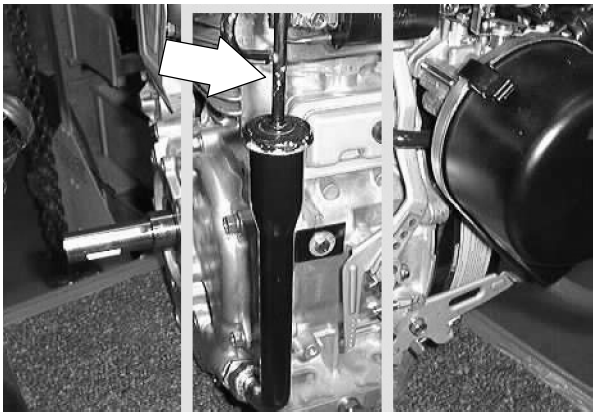


13. Reinstall the left hand side panel.

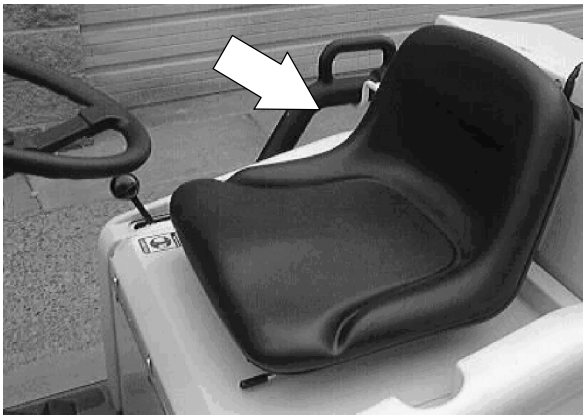
14. Reconnect the battery cables to the battery.



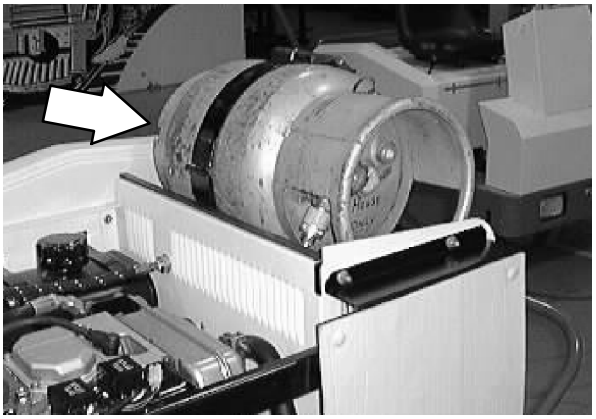
15. Check the engine for oil. If needed, fill the engine with oil. The capacity of this engine is 0.65 liters (0.17 U. S. gallon). Use an automobile grade SAE #20, #30, or 10W–30.



16. Disengage the prop rod and close the seat support.



17. LP MACHINE: Install the LP tank mounting brackets and LP tank. Reconnect the LP hose to the tank. Open the valve.



18. Start the engine and check for proper operation.

We Need Your Help...

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Machine _____ ❑ Report Error ❑ Suggestion

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