OPERATION & PARTS MANUAL

P4075D Power Pack

SN: FA40040F

Supplement for the GBM Operator's Manual

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SERVICE • RELIABILITY • INNOVATION

Introduction

This supplement to your GBM Operator's Manual contains important safety, operation, maintenance and parts information for your Akkerman P4075D Power Pack. You must read and understand this manual and the GBM Operator's Manual before you operate and maintain this equipment. Keep this manual with your Power Pack at all times. Additional copies of this supplement may be purchased from the Akkerman Aftermarket Support Department, or downloaded from the Akkerman web site at www.akkerman.com.

The contractor is responsible for the overall safety program on the job site. Use this manual as a part of the safety program.

The use of second rate parts could affect the efficient performance of the Power Pack. ALWAYS use genuine Akkerman parts.

Understand safety signal words, DANGER, WARNING, CAUTION, SAFETY INSTRUCTIONS, and NOTICE. When you see these words in this manual or on safety decals mounted on your equipment, follow the safety message to avoid personal injury and/or property damage.

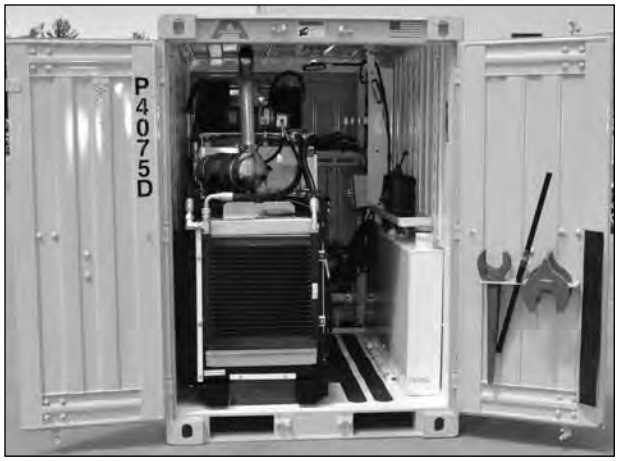
⚠DANGER Indicates an extremely hazardous situation which, if not avoided, WILL result in death or serious injury.

⚠WARNING Indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.

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

SAFETY INSTRUCTIONS Usually consists of individual messages stating procedures or actions that must be followed for the safe operation of a product.

NOTICE Identifies potential property damage and important installation, operator, or maintenance information.



Akkerman P4075D Power Pack

The Akkerman P4075D Power Pack provides hydraulic power for the GBM jacking frame. The P4075D is equipped with a 74 HP tier IV diesel engine which drives two load sensing, variable volume and torque limiting piston pumps.

If you find any errors with this supplement or know of ways to improve procedures, please let us know. Mail your suggestions to: Akkerman Inc, ATTN: Technical Publications
58256 266th Street, Brownsdale, MN 55918.

Akkerman Inc. reserves the right to improve its product without notice or obligation.

NOTES

Contents

NOTES

Safety

⚠WARNING Do not operate this equipment until you have read, study and understand this manual, your GBM Operator's Manual, your engine operation manual and any additional equipment manuals before you operate and maintain this equipment. Failure to do so, could result in severe personal injury or death.

BE ALERT FOR SAFETY INFORMATION

When you see this safety alert symbol on your equipment or in this manual, be alert to the possibility of personal injury or property damage.

Read all safety information.

Keep safety decals clean and in good condition. Replace missing or damaged safety decals.

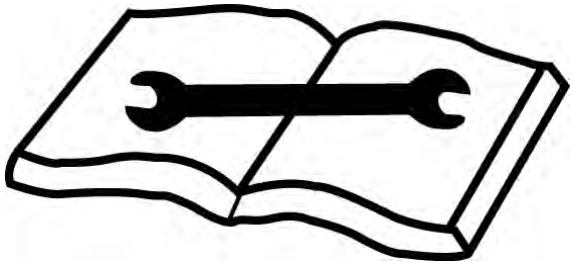
ATTENTION!
BECOME ALERT!
YOUR SAFETY IS INVOLVED!

READ OPERATOR'S MANUAL

⚠WARNING Unsafe operation or maintenance can cause severe injury or death.

Read and understand the Operator's Manual before operating or servicing this equipment.

Any unauthorized modifications will void the warranty.



WEAR PROTECTIVE CLOTHING

Wear OSHA approved protective clothing, such as hard hat, gloves, safety goggles, earmuffs or ear plugs, face shield, and steel-toed boots, when operating and servicing this equipment.

Wear reasonably close fitting clothing and remove jewelry before working on or near this equipment. This will help prevent the danger of catching them in moving parts or controls.

MAINTAIN BATTERY SAFELY

⚠WARNING Batteries produce explosive gases.

Wear eye protection and protective clothing during battery service.

Keep sparks, flames, and cigarettes away from batteries.

Contact with battery acid can cause severe burns. Flush immediately and thoroughly with clean water. Get medical attention immediately.

Charge a battery only in a well-ventilated area.

Never charge a frozen battery.

LOCKOUT TAGOUT POWER BEFORE SERVICING

⚠WARNING Failure to lockout tagout power before servicing can cause severe personal injury or death.

LOCKOUT TAGOUT main power supply before servicing. Electrical repairs must be performed only by a certified electrician.

HYDRAULIC OIL/FLUIDS UNDER PRESSURE

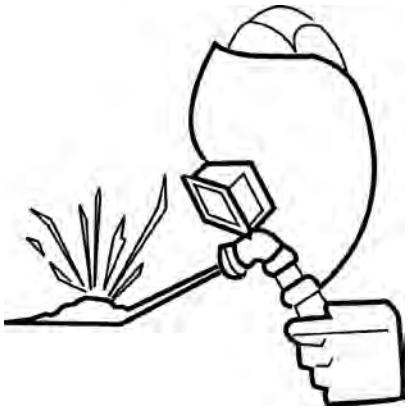
⚠WARNING Escaping oil or other fluids under pressure can penetrate your skin causing serious injury.

Release all pressure before performing maintenance or repairs. Never weld near pressurized fluid lines.

DO NOT use your hands to check for leaks. When searching for leaks, use a piece of wood or cardboard.

Contact medical help immediately if any oil or fluid is injected into your skin. A serious infection or reaction can emerge without proper medical treatment.

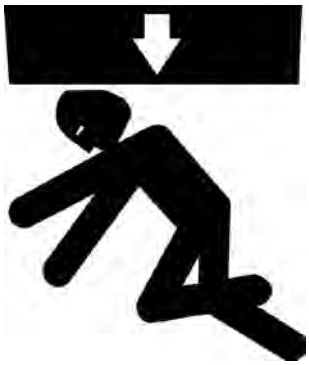
UNAUTHORIZED WELDING



⚠WARNING Unauthorized welding can cause structural failure resulting in possible injury or death.

Do not weld on any structural member.
Unauthorized welding or repair will void the warranty.

BEWARE OF SUSPENDED LOADS



⚠WARNING Suspended loads may fall and cause severe personal injury or death.

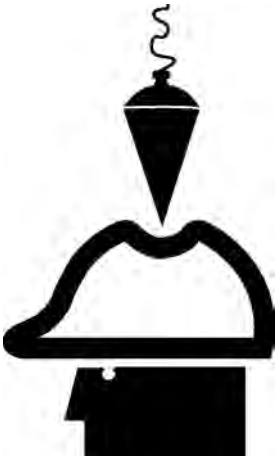
If a hydraulic hose breaks from the boom of a crane/excavator, or the lifting support fails, the boom and/or load can fall instantly.

Do not enter area under or around a suspended load.

KEEP PERSONNEL AWAY FROM MOVING PARTS

⚠WARNING Crushing hazard.
Keep personnel away from inside of GBM when jacking or moving GBM. Failure to do so could result in serious personal injury or death.

USING PLUMB BOB



⚠WARNING Falling plumb bob can cause serious personal injury or death, and/or equipment damage.

NEVER hang or secure the plumb bob overhead when not in use.

ALWAYS remove the plumb bob from the string lines and place in storage container after use.

HANDLING AUGER CASINGS

⚠WARNING Auger may fall out of casing and cause severe injury or death if casing tips or hits an obstruction.

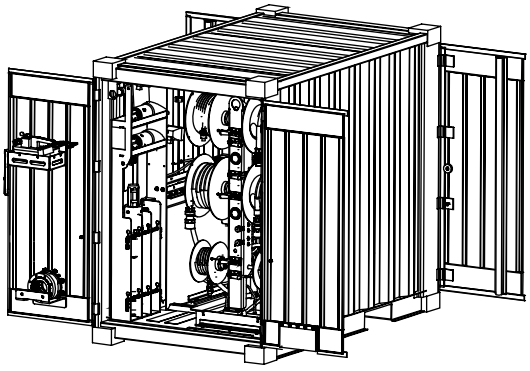
Properly install safety chain assembly or casing auger pin to augers and casings before lowering into or lifting out of shaft.

Do not stand or walk under a load.

REGULARLY CLEAN AND INSPECT EQUIPMENT

Remove any grease, oil, or debris buildup to avoid potential injury or equipment damage.

Inspect equipment for damage. If damaged, repair or replace immediately.



PRACTICE SAFE MAINTENANCE

⚠WARNING Unexpected Jacking System movement may cause serious personal injury.

LOCKOUT TAGOUT power before performing any maintenance.

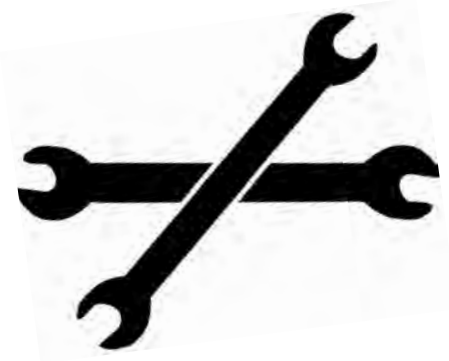
Shut down GBM before making repairs, adjustments, or removing obstructions.

Only trained and qualified personnel should perform maintenance or repairs.

Keep the area around the equipment clean and dry when performing maintenance.

Do not service the machine while it is in motion.

Replace worn or damaged parts. Remove grease, oil, or debris buildup.



AVOID PINCH POINTS

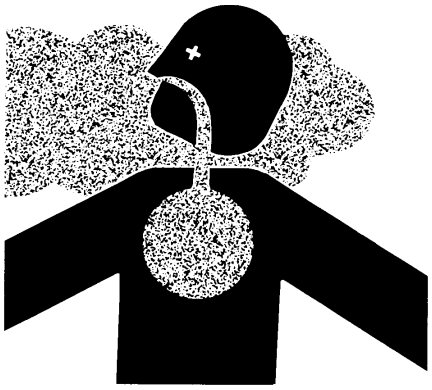
⚠WARNING Moving parts or the mishandling of parts can cause severe personal injury.

Keep hands away from moving parts.

Watch your fingers, hands, and legs while equipment is in operation.

Handle parts carefully to avoid crushing and pinch point hazards.

TEST SHAFT & TUNNEL VENTILATION



⚠WARNING Keep shafts and tunnel well ventilated at all times.

Use an approved air analyzer to detect hazardous gases and oxygen content.

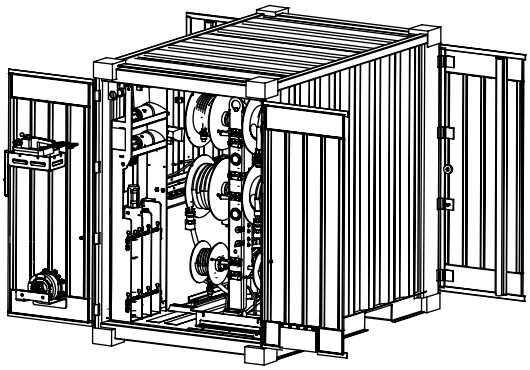
Before and during the shaft operation, test for combustible and toxic gases and oxygen deficiency.

If the levels exceed OSHA prescribed levels, leave tunnel and shaft immediately! Do not activate or deactivate any electrical or hydraulic devices, since any sparks could cause an explosion.

Once ALL personnel are out of tunnel/shaft, cut power from power source.

Gases must be removed before reentering tunnel/shaft.

HIGH PRESSURE HYDRAULICS



⚠WARNING The GBM system contains high pressure hydraulics.

Keep all guards in place.

FIRE PREVENTION

⚠CAUTION Fires can cause injury or property damage.

Keep equipment clean. Remove all debris from equipment.

Have a fire extinguisher available at all times. Keep the fire extinguisher fully charged.

KEEP AWAY FROM AUGER

⚠DANGER Contact with rotating auger will cause severe injury or death.

Keep hands, body, and objects clear of operating auger.

Do not operate without covers and guards in place.

Lockout tagout power before servicing.

SLIPPERY WHEN WET

⚠WARNING Slips and falls can cause serious personal injury.

Ensure firm footing in wet or slippery conditions.

Replace skid-resistant material if it is damaged or missing to prevent slips and falls.

Remove any buildup of grease, oil, or debris.

KEEP JOB SITE CLEAN AND ORGANIZED

⚠WARNING Tripping can cause serious personal injury.

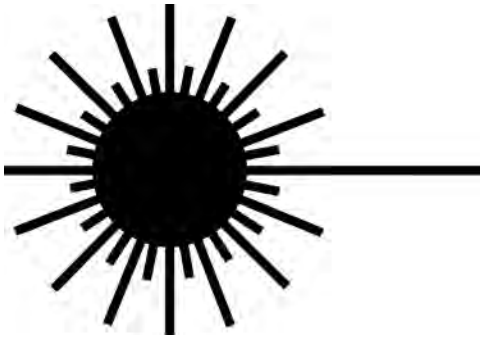
Be sure to keep job site clean and organized.

NO SMOKING IN TUNNEL

⚠WARNING Smoking in tunnel could cause an explosion if combustible gases are present.

Do not smoke in tunnel.

AVOID LASER LIGHT EXPOSURE

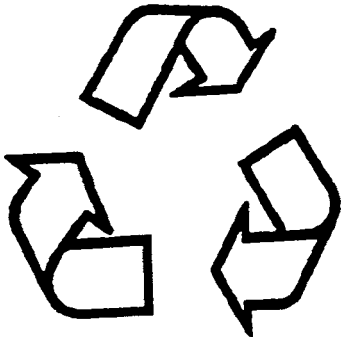


⚠DANGER Staring into laser light will cause severe injury.

Do not stare into laser guidance system light beam. Avoid direct eye exposure.

To avoid possible exposure to radiation in excess of acceptable emission limits, all repairs to laser must be performed by the original manufacturer or an authorized service technician.

RECYCLE WASTE



Follow local, state, federal, and international regulations when recycling or disposing of waste. Waste includes fluids/oil, fuel, filters, coolant, and batteries.

Use leakproof containers when draining fluids/oil. Do not pour waste on the ground, down a drain, or into any water source.

NOTES

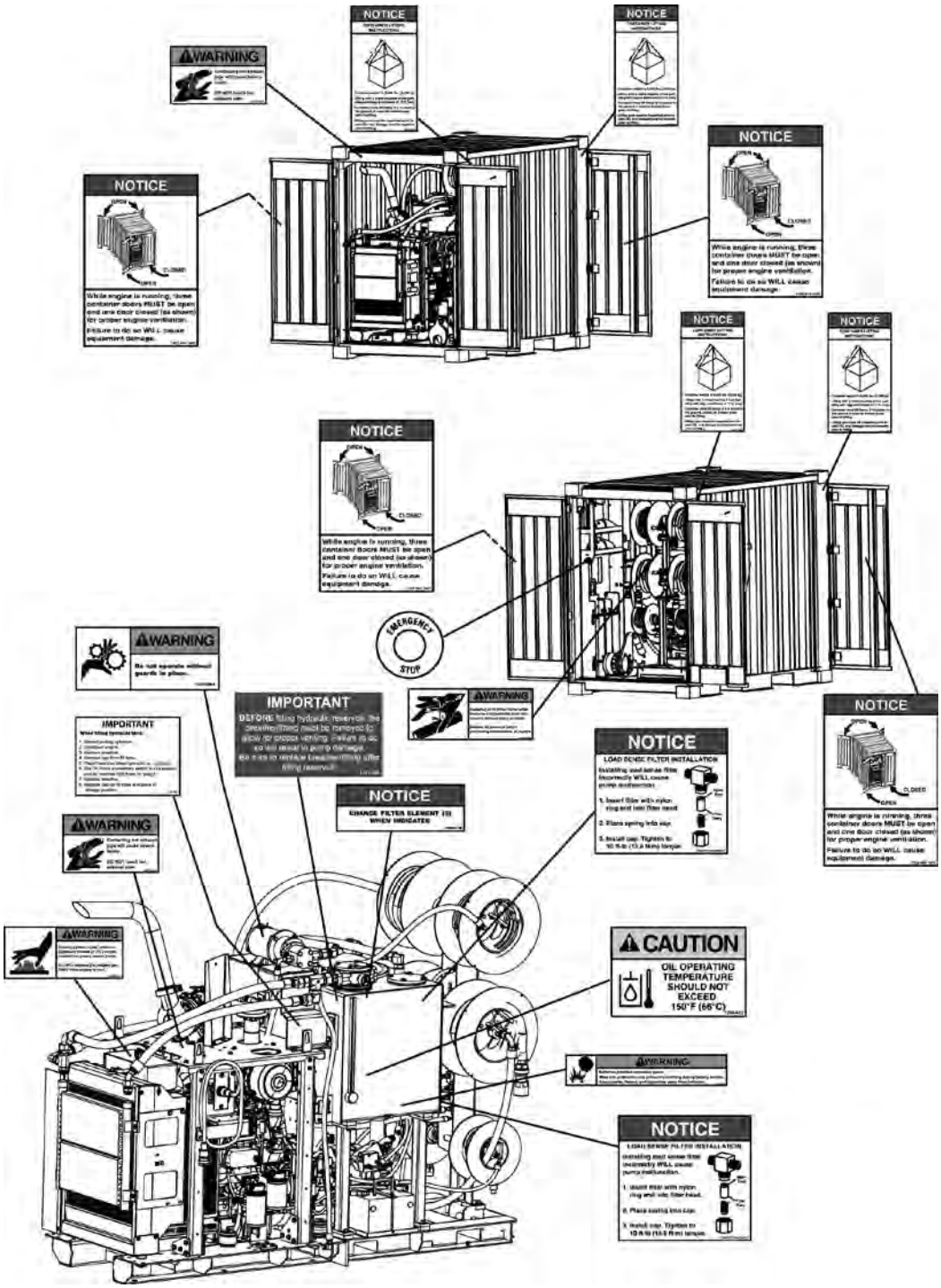
Safety Decals

Keep all safety decals and operational decals clean and readable. Use soft cloth, water, and a mild soap to clean the decals if they are too dirty to read. DO NOT clean safety decals with solvent. Solvent can damage them. Replace safety and operational decals immediately if they are damaged, missing, or hard to read.

Serious injury or property damage can occur if safety instructions are not followed. Contact your Akkerman Aftermarket Support representative for free replacement safety decals.

If a part is replaced that has a safety decal on it, apply a new safety decal to the replacement part. Before applying a new decal, be sure the surface is clean and dry.

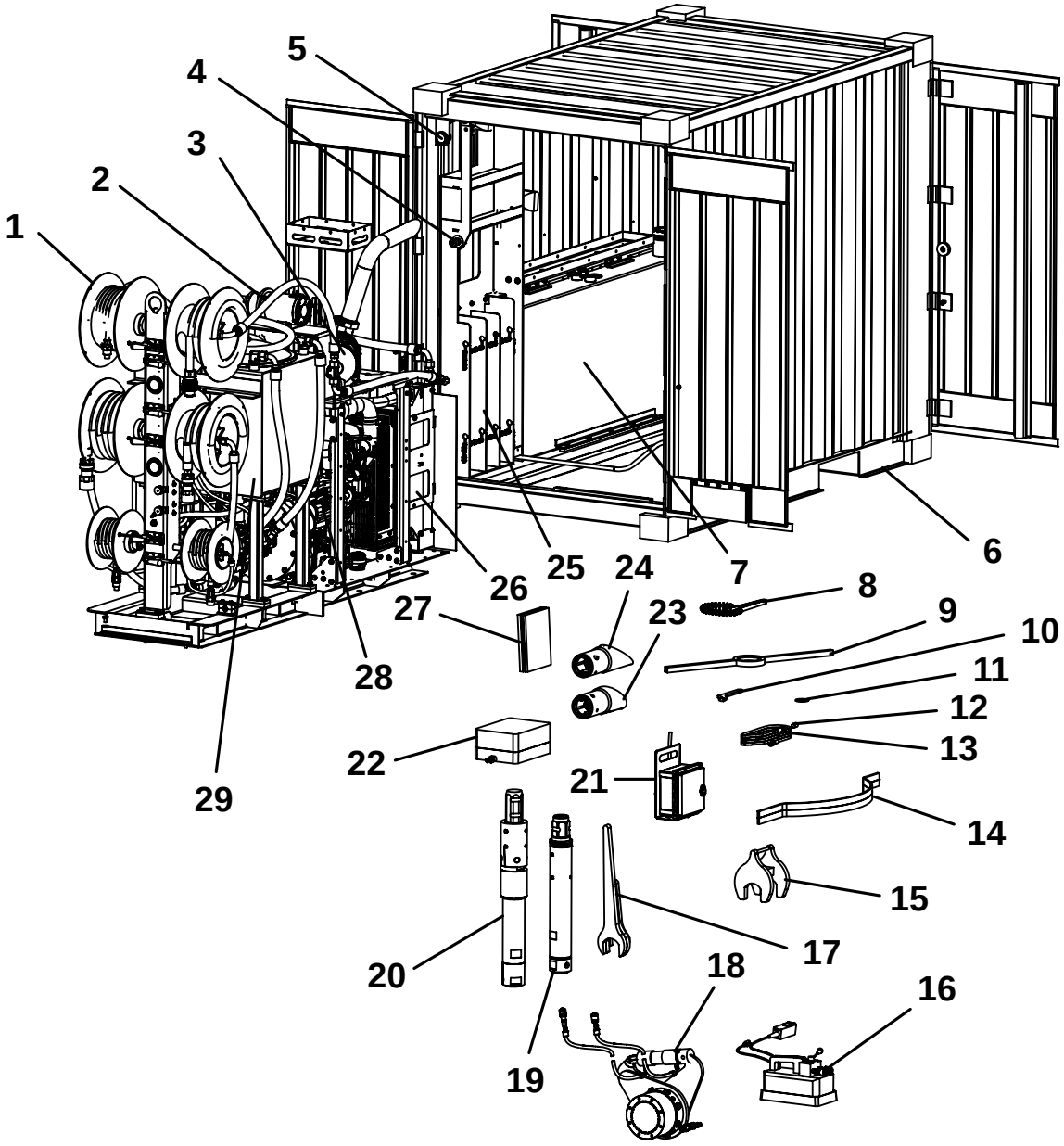
P4075D POWER PACK



NOTES

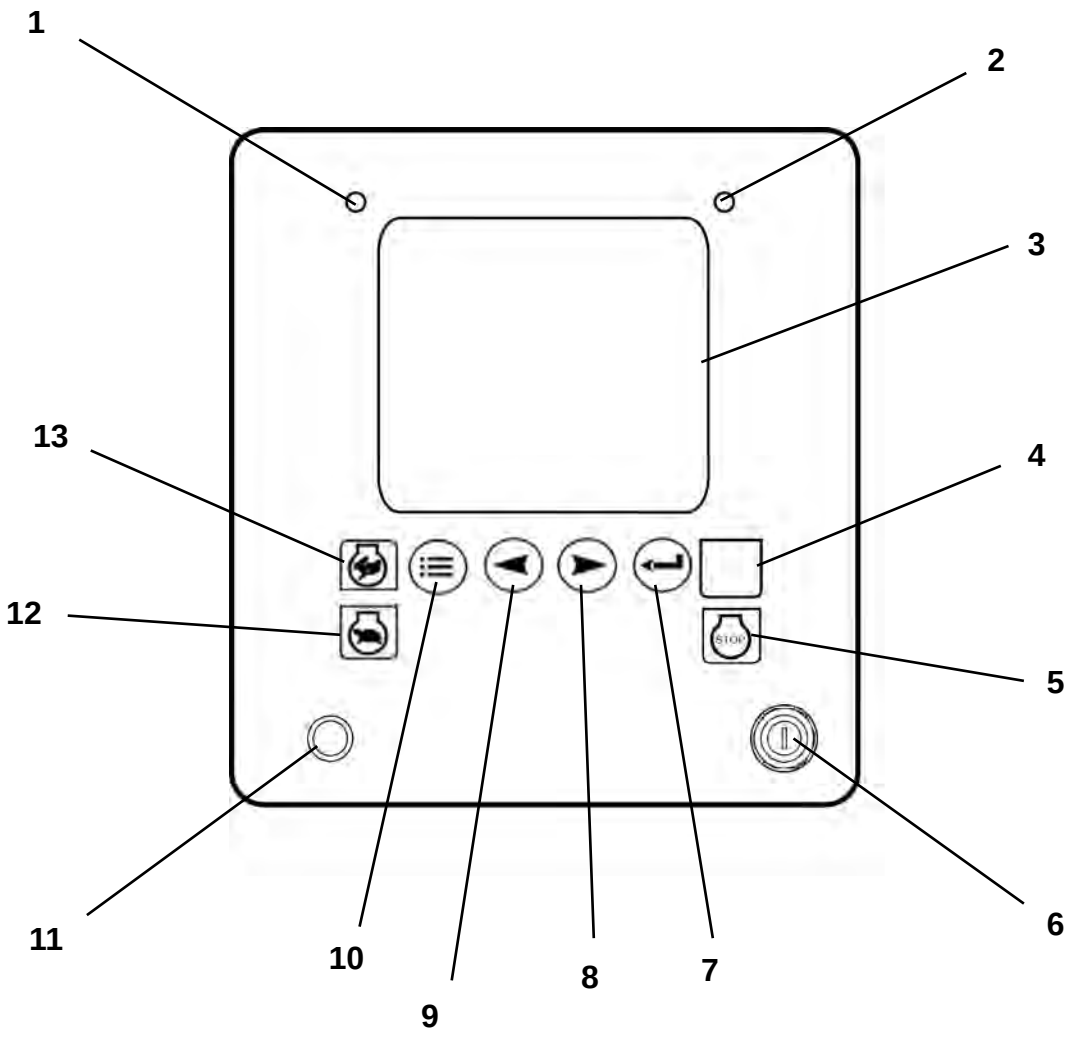
Terminology

P4075D POWER PACK



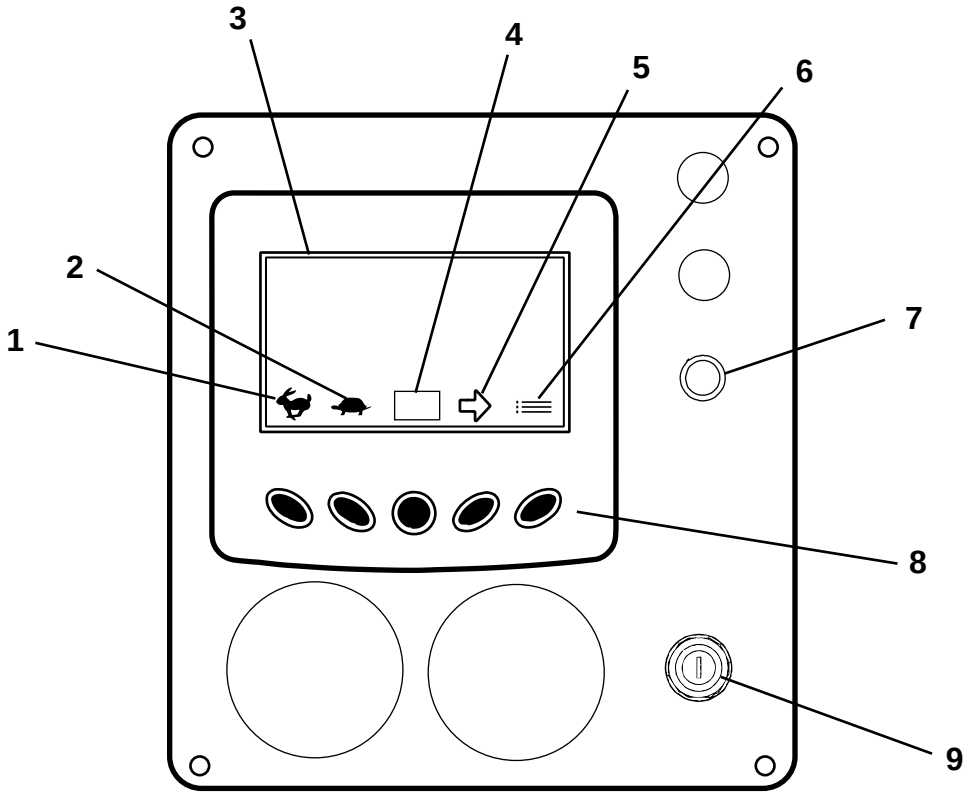
1. Hydraulic Hose Reels
2. Cooling Pump
3. Exhaust Catalytic Converter
4. Emergency Stop
5. Fuel Level Gauge
6. Container
7. Fuel Tank 50 Gal.
8. Chain Wrench
9. Pilot Tube Scraper
10. Spanner Wrench
11. Pilot Tube O-rings
12. Cable Extension Adapter
13. Cable, Guidance System
14. Pilot Tube Support
15. Launch Shaft Breakout Tool
16. Breakout Tool Power Pack
17. Wrench Set
18. Dual Tube Breakout Tool
19. Steering Head Adapter
20. Reaming Head Adapter
21. Control Pendant With Hanger
22. Nitrogen Purging Kit
23. Steering Head - 30 Degree
24. Steering Head - 45 Degree
25. Tooling Storage
26. Radiator & Oil Cooler
27. Manual
28. Diesel Engine, 74 HP Tier IV
29. Hydraulic Reservoir 50 Gal.

CONTROL PENDANT - SN FA40040F-04 & BEFORE



1. Warning Indicator
2. Shutdown Indicator
3. Display Screen
4. Not Used
5. Stop Button
6. Key Ignition Switch
7. Enter Button
8. Right Arrow Button
9. Left Arrow Button
10. Menu
11. Fuse
12. Decrease Speed Button
13. Increase Speed Button
14. Diagnostic Port (located on backside of control pendant)

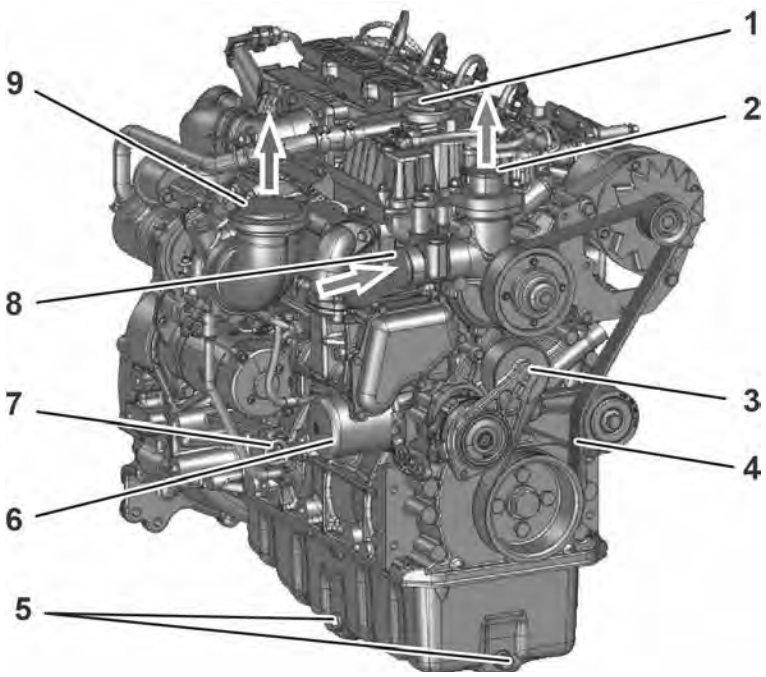
CONTROL PENDANT - SN FA40040F-05 & AFTER



1. Increase Speed Icon
2. Decrease Speed Icon
3. Display Screen
4. Start/Stop Engine Indicator
5. Next Gauge Screen Icon
6. Main Menu Icon
7. Fuse
8. Soft Key Selection Enter Buttons
9. Key Ignition Switch
10. Diagnostic Port (located on backside of control pendant)

ENGINE

NOTICE Refer to your Deutz engine operating manual for more information.



1. Crankcase
2. Coolant Outlet
3. Tension pulley
4. V-Rib Belt
5. Lubricating Oil Drain Plug
6. Lube Oil Replacement Filter
7. Lubricating Oil Dipstick
8. Coolant Inlet
9. Exhaust Outlet Breather

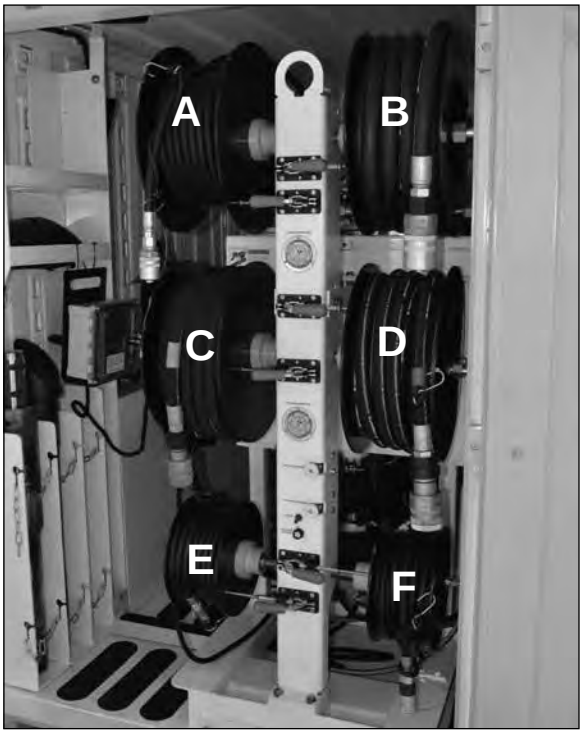
Controls & Instruments

P4075D POWER PACK CONTROLS

The P4075D power pack provides hydraulic power for the jacking frame and tooling components. The four cylinder, 74 HP diesel engine drives dual load sensing, variable volume, and torque limiting piston pumps.

The hydraulic hoses are stored on hose reels for ease of routing hoses to jacking frame.
The hoses are connected to the GBM hydraulic connections as follows:

A – Case Drain Hydraulic Hose Connection
B – Return Hydraulic Hose Connection
C – Thrust Pressure Hydraulic Hose Connection
D – Rotation Pressure Hydraulic Connection
E – Thrust Load Sense Hydraulic Hose Connection
F – Rotation Load Sense Hydraulic Hose Connection



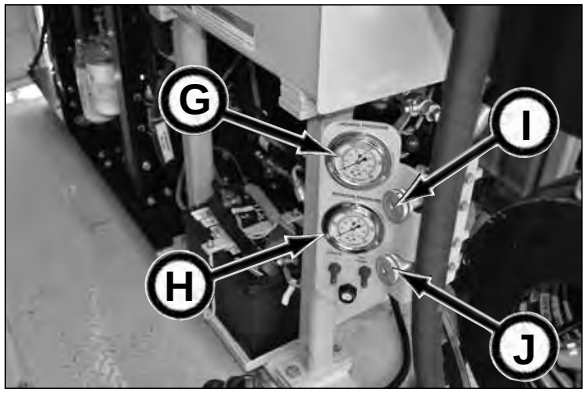
SN FA40040F-04 & After Shown

Hydraulic Pressure Gauges & Adjustment Valves
Use the pressure gauges to monitor the GBM jacking thrust (G) and rotation (H) pressures.

Operating range is up to 4,000 psi (27.579 mPa). Maximum pressure is 5,000 psi (34.474 mPa).

The pressure adjustment valves are factory set at 5,000 psi (34.474 mPa). If your pipe has a lower thrust load pressure rating, use adjustment valve (I) to adjust the pressure to protect the product pipe. To adjust the pressure, refer Adjusting Thrust Pressure in section 6, Operation. The rotation adjustment valve (J) should not be adjusted.

G – Jacking Thrust Pressure Gauge
H – Rotation Pressure Gauge
I – Jacking Pressure Adjustment Valve
J – Rotation Pressure Adjustment Valve



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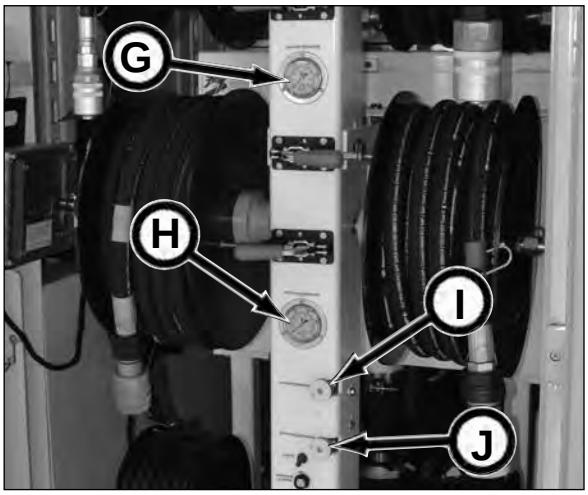


SN FA40040F-04 & After

(Continued on next page)

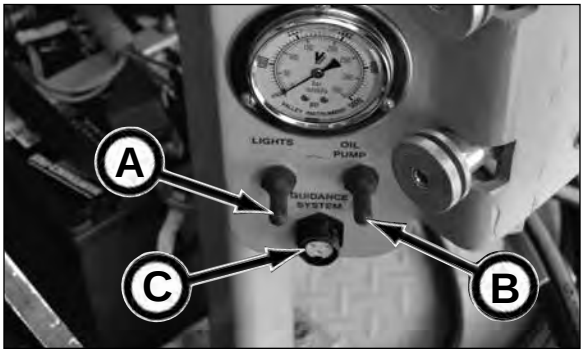
POWER PACK CONTROLS (continued)

Container Light Switch (A)

Oil Pump Switch (B)
Flip switch to ON position to pump hydraulic oil into the hydraulic reservoir. Once reservoir is full, be sure to flip oil pump switch to the OFF position.

> **IMPORTANT: BEFORE** filling hydraulic reservoir, the breather/fitting must be removed to allow for proper venting. Failure to do so may result in pump damage. Be sure to replace breather/fitting after filling reservoir.

Guidance System
The 12V connection (C) is equipped to supply power to the 12V guidance system. The main power must be on for power to this connection. The E-Stop does not affect the power to the guidance system.



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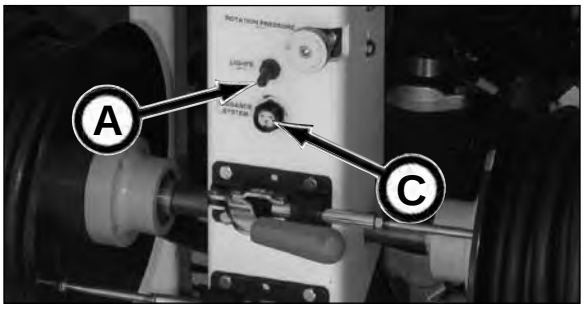

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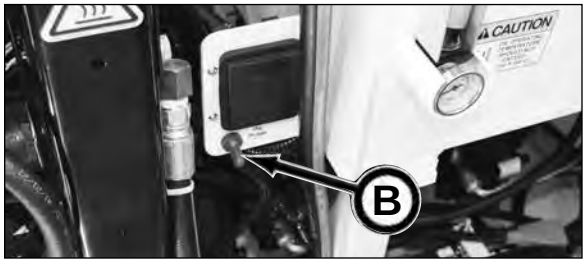
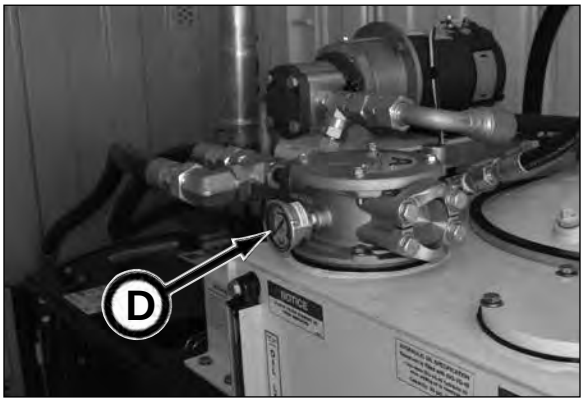


SN FA40040F-04 & After

Hydraulic Return Filter Indicator (D)
To prevent under or over servicing of the hydraulic filter element, a filter indicator has been installed on the GBM Power Pack hydraulic reservoir.

The green OK zone indicates that the filter is functioning properly. The yellow zone indicates that the filter will soon require replacement.

Replace return filter when the needle on the gauge is in the red CHANGE zone (see 3. Check Hydraulic Return Filter Indicators in section 9, Periodic Maintenance).



Emergency Stop (E)
Push Emergency Stop button (B) IN to stop all electrical and hydraulic functions.

The button will illuminate when it is pulled OUT.

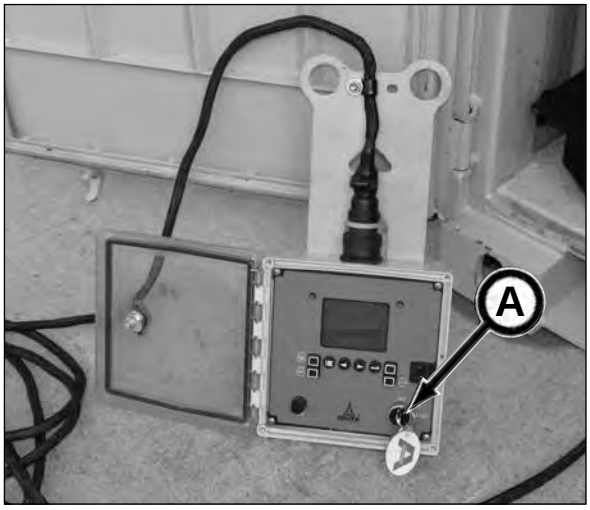
This button must be pulled out to restart engine.

NOTES

CONTROL PENDANT SN FA40040F-04 & BEFORE

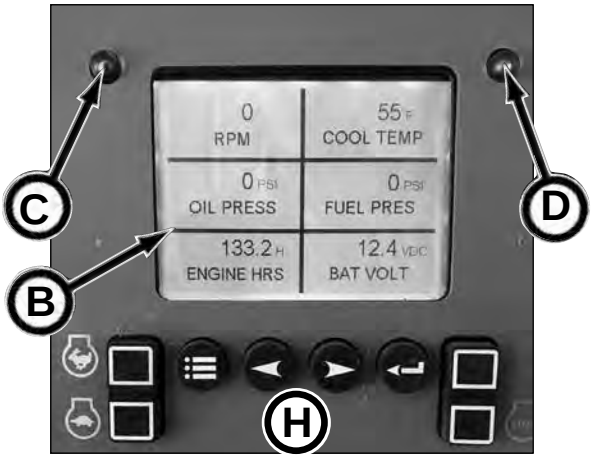
NOTICE Refer to your Deutz engine manual and dealer for more information.

The control pendant allows the operator in the launch shaft to control the power pack and monitor vital engine functions.



Key Start Switch (A)
The three-position key start switch (A) controls the engine electrical system. When the key switch is turned clockwise to START, the engine will crank.
When the engine starts, the key is released and returns to the ON (RUN) position. Do not crank the engine more than 20 seconds. Doing so will damage starter.

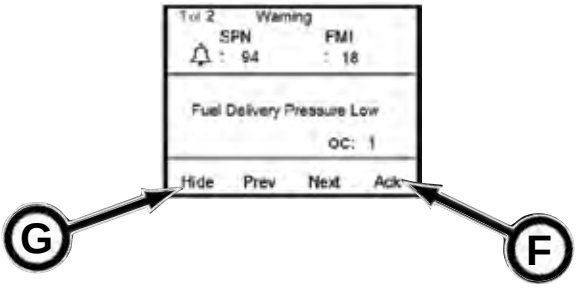
Display Screen (B)
The display screen shows the engine functions and any engine faults and warnings. The fault indicators will display at the top of the screen.



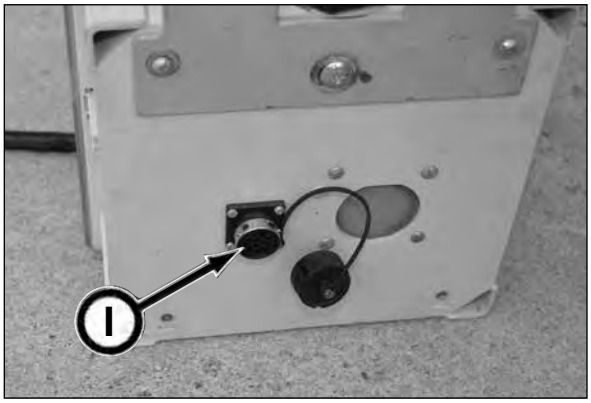
Visual LED Indicators
The visual indicators will illuminate when the Engine Control Unit (ECU) issues a fault code (warning) or a severe fault code (shutdown).

Warning (Amber) Light (C)
Shutdown/Derate (Red) Light (D)

NOTE: To acknowledge a fault, then remove it from view and return to a gauge display screen, press Enter (Ack) (F), then press Menu (Hide) (G). This only serves as a temporary measure, the fault must still be resolved to avoid situations that may damage or destroy and engine.



Keypad Functions (H)
Refer to Control Pendant - Keypad Functions in this section.

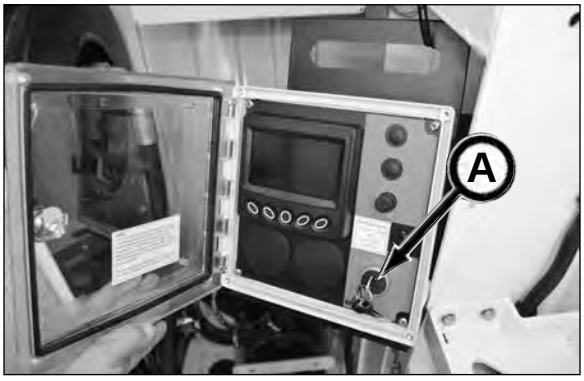


Diagnostic Port (I)
The diagnostic port will be used by a certified Deutz engine technician in the event troubleshooting of the engine operation is required.

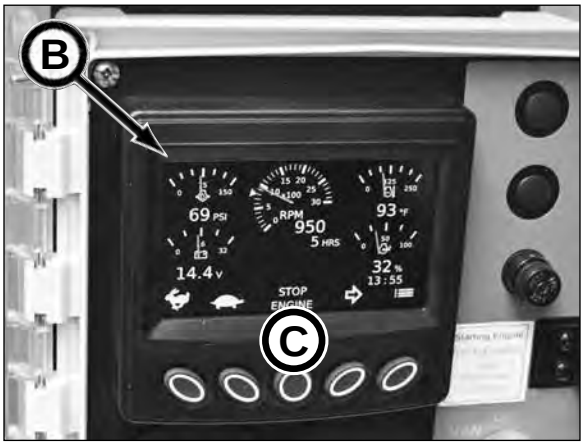
CONTROL PENDANT SN FA40040F-05 & AFTER

NOTICE Refer to your Deutz engine manual and dealer for more information.

The control pendant allows the operator in the launch shaft to control the power pack and monitor vital engine functions.



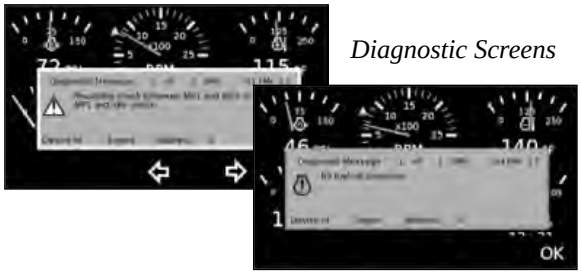
Key Start Switch (A)
The three-position key start switch (A) controls the engine electrical system. Turn key switch CCW to MAN (Manual) position. Push START ENGINE soft key button; the engine will crank.
When the engine starts, release the soft key button. Do not crank the engine more than 20 seconds. Doing so will damage starter.



Display Screen & Pop-Up Messages(B)
The display screen shows the engine functions and any engine diagnostic messages. Pop-up messages will appear on the display screen when the Engine Control Unit (ECU) issues a fault code (warning) or a severe fault code (shutdown):

- Warning (Yellow) Message
- Stop (Red) Message

NOTE: To close the diagnostic pop-up message, all messages must be acknowledged; press OK soft key button.



Diagnostic Screens

Keypad Functions (C)
Refer to Control Pendant - Keypad Functions in this section.

Diagnostic Port (D)
The diagnostic port will be used by a certified Deutz engine technician in the event troubleshooting of the engine operation is required.

CONTROL PENDANT - KEYPAD FUNCTIONS - SN FA40040F-04 & BEFORE

NOTICE Refer to your Deutz engine manual for more information.

	**Menu** – Enter or exit menu screens.
	**Left Arrow** – Scroll the screen or move the parameter selection to the left or upward.
	**Right Arrow** – Scroll the screen and move the parameter selection to the right or downward.
	**Enter Key** – Select a menu or parameter or hide/view an active fault code.
	**Increase Speed** – If Speed Control is ON, press to throttle up. Each time the **Rabbit** is pressed, the throttle demand increases the engine to the desired speed. The speed settings are 800, 1600, 2000 and 2400 rpm.
	**Decrease Speed** – If Speed Control is ON, press to throttle down. Each time the **Turtle** is pressed, the throttle demand decreases the engine to the desired speed. The speed settings are 800, 1600, 2000 and 2400 rpm.
	**Stop** – Press to stop engine operation.

CONTROL PENDANT - KEYPAD FUNCTIONS - SN FA40040F-05 & AFTER

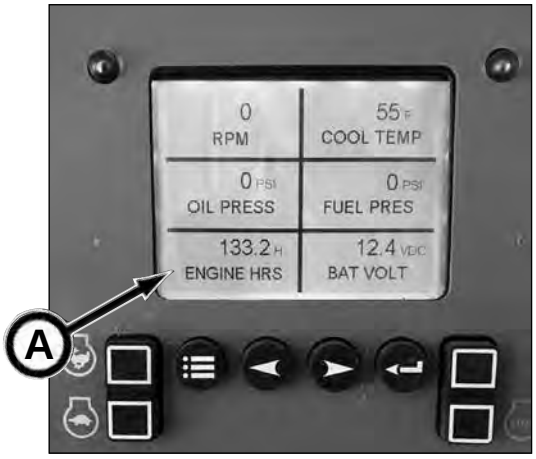
NOTICE Refer to your Deutz engine manual for more information.

The following table shows the buttons available when in Manual mode.

	Press the soft key under this symbol to access the **Main Menu**.
	Press the soft key under this symbol to move to the next gauge screen.
START/STOP ENGINE CRANKING TIMEOUT	• **START ENGINE** only displays when the engine is not running. Pressing START ENGINE causes the engine to crank as long as the button is pressed. **CRANKING** displays in yellow on the screen while the button is pressed. Hold **START ENGINE** for more than 45 seconds without the engine running and the CRANK output becomes inactive. When CRANK is inactive, **TIMEOUT** displays in red for 5 additional seconds after START ENGINE is released. • **STOP ENGINE** only displays when the engine is running. Press the STOP ENGINE soft key and the RUN output becomes inactive and removes power from the ECU, shutting OFF the engine. The RUN output becomes active again after the engine stops.
Rabbit Symbol 	This symbol only displays when the engine is running. Press the RABBIT soft key to increase RPM by 10. Hold the soft key to increase the RPM by the ramp rate you set in the **Service Menu**, **INCR Ramp Rate** parameter.
Turtle Symbol 	This symbol only displays when the engine is running. Press the TURTLE soft key to decrease the RPM by 10. Hold the soft key to decrease the RPM by the ramp rate you set in the **Service Menu**, **DECR Ramp Rate** parameter.

CONTROL PENDANT - HOURMETER

The default operating screen will display the engine hours (A).



SN FA40040F-04 & Before

SN FA40040F-05 & After

Pre-Start Inspection

⚠WARNING Do not operate this equipment until you have read, study and understand this manual, your GBM Operator's Manual, your engine operation manual and any additional equipment manuals before you operate and maintain this equipment. A daily inspection of the equipment must be performed to prevent severe personal injury or death and equipment damage.

The contractor is fully responsible for the safety of all personnel on the job site. Check with the contractor that all site preparation requirements are in place. Be sure to comply with all OSHA regulations, such as: an active safety program is in practice, a confined space permit (if needed) is issued, personal protective equipment is being worn; flammable, combustible, and hazardous materials are properly stored; and a lockout/tagout procedure is in place.

Use the following checklist ✓ as a guide for your daily pre-start inspection. Make a copy of this Pre-Start Inspection checklist. Once it is complete, check off, initial and date each item and file the copy as a record of Inspection.

	1. Use "ONE-CALL" notification to check for buried utility lines prior to tunneling.
	2. Check the excavated launch and reception pits or shafts for proper shoring or bracing to prevent slides or cave-ins.
	3. Thoroughly clean equipment of mud and dirt.
	4. Check condition of personal protective equipment. Replace equipment if defective.
	5. Contractor is responsible for all personnel to wear proper protective equipment on the job site.
	6. Remove combustible or flammable materials from equipment. Store materials properly.
	7. Test air monitoring and ventilation detectors for proper operation.
	8. Test E-Stop operation. If operation is faulty, E-Stop MUST be repaired before operation.
	9. Check engine diesel fuel level. Add as needed.
	10. Check engine crankcase oil level. Add as needed.
	11. Check engine cooling air intake areas and external surfaces of engine. Be sure they are clean and unobstructed.
	12. Check engine air cleaner components; in place and securely fastened.
	13. Check controls and switches for proper operation. Repair or replace if damaged or worn.
	14. Check hydraulic reservoir oil level. Add as needed.
	15. Inspect GBM equipment for damage. Repair or replace as needed.
	16. Be sure all covers and guards are in place before operation.
	17. Check for loose or missing hardware. Replace damaged or missing hardware.
	18. Check for worn, loose, or damaged wire. Repair or replace wiring.
	19. Tighten loose clamps or fittings.
	20. Check wire harnesses for frayed or worn insulation or wires. Replace damaged or worn harnesses.
	21. Check for fluid leaks. Repair leak or replace components.
	22. Keep job site clean and organized.
	23. Check equipment for proper lubrication.
	24. Remove all personnel from inside the GBM.
	25. Check for leaks in hydraulic hoses and/or lines (replace defective hoses and/or lines).
	26. Check hydraulic hoses and lines for wear and/or damage. Replace any defective hoses and/or lines.
	27. Remove all tools on GBM.

NOTES

Operation

⚠WARNING Do not operate this equipment until you have read, study and understand this manual, your GBM Operator's Manual, your engine operating manual and any additional equipment manuals before you operate and maintain this equipment. Failure to do so, could result in severe personal injury or death.

OPERATING GUIDELINES

⚠WARNING Do not operate this equipment until you read, study, and understand this manual and your GBM Operator's Manual. Failure to do so, could result in severe personal injury or death.

1. Do not operate this equipment while under the influence of alcohol, drugs, or medication.
2. Follow all Federal, State, and Local safety regulations and procedures.
3. Be sure OSHA prescribed safety personal protective equipment is being worn by all personnel.
4. Be sure the area is safe for operation. Keep work site clean and organized.
5. NEVER operate equipment if it has been engulfed with water. Contact your Akkerman Aftermarket Support representative for proper procedures on how to restore equipment for operation.
6. Have a fully charged fire extinguisher on the job site at all times.
7. Before operating, repair all equipment problems.
8. Be sure the excavated launch and reception pits or shafts are properly shored or braced to prevent slides or cave-ins.
9. Test air monitoring and ventilation detectors for proper operation. Never enter a tunnel without gas detectors.
10. A fully trained and qualified signal person must direct the excavator or crane operator when lifting and lowering equipment into the launch or reception pits.
11. Never walk or work under any part of the excavator or crane and suspended loads.
12. Remove plumb bobs from string lines and place in storage container after use. Never hang or secure plumb bobs over shaft. Doing so may cause severe injury or death from a falling plumb bob.
13. Operate jacking system at lowest pressure possible to prevent excessive heat build up.
14. Test all controls to make sure they work properly.
15. Pressure peaks cause hoses to jump without notice. Keep all personnel away from hoses during operation of equipment.
16. Lock out electrical power at the source (generator) before servicing electrical components.
17. Beware of pinch points.
18. If this manual is lost, contact your Akkerman Aftermarket Support Representative for a new manual or download this manual from the Akkerman web site at www.akkerman.com.
19. High pressure hydraulics are used on the GBM. Be sure all covers and guards are in place before operating.
20. Do not make any modifications to any Akkerman products. Doing so could cause structural failure and will void the warranty.
21. Do not make adjustments or repairs to the hydraulic system components while in operation or until all pressure is released and power pack is locked out, tagged out.

USING EMERGENCY STOP

Push Emergency Stop button (A) IN to stop all electrical and hydraulic functions.

The button will illuminate when it is pulled OUT.

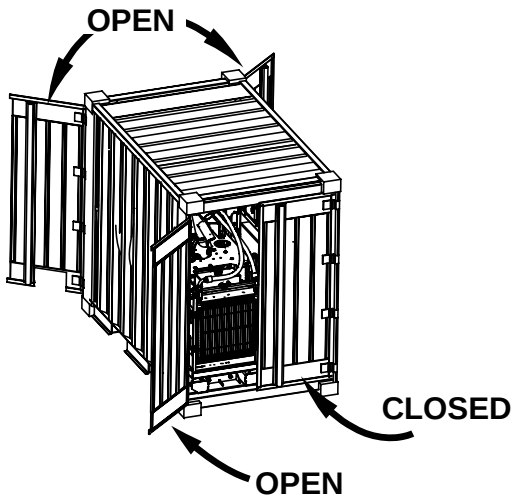
This button must be pulled out to restart engine.

SETTING UP THE POWER PACK

1. Position the Power Pack on firm, level ground at the top of the launch shaft.

⚠WARNING Do not position the GBM Power Pack near the edge of the shaft where the ground may be unstable and cause a slide or cave-in. Doing so could cause severe injury or death.

2. **IMPORTANT:** Three container doors MUST be open (as shown) while engine is running to allow proper engine ventilation. Running engine with doors closed WILL cause engine damage.



(Continued on next page)

3. Perform the daily maintenance items listed in section 9, Periodic Maintenance of your GBM Operator's Manual.

4. Clean hose connections prior to connecting hoses.

5. Connect hydraulic hoses from the power pack to the GBM frame connections BEFORE starting engine. Refer to the operation section in your GBM Operator's Manual to properly install hoses to quick couplers.

NOTICE All hoses must be securely connected. If not equipment will be damaged.

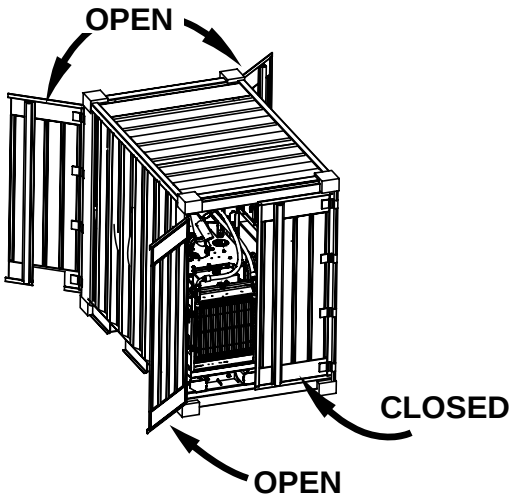
STARTING THE POWER PACK

NOTICE Refer to your engine Operating manual for detailed information on the proper break-in/ cold weather starting and operation of your engine.

1. Check engine oil level. Add oil as necessary.

2. Open three container doors as shown

   IMPORTANT: Three container doors MUST be open while engine is running to allow proper engine ventilation. Running engine with doors closed WILL cause engine and component damage.

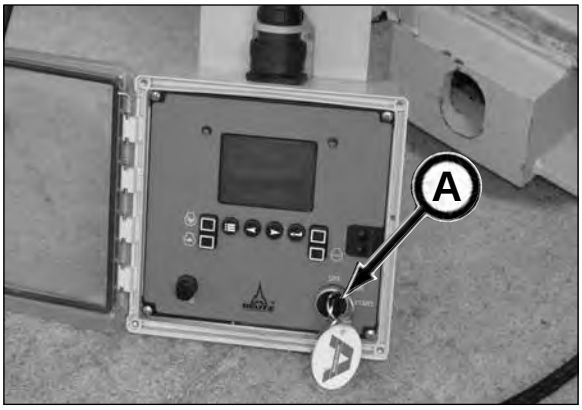


3. Be sure Emergency Stop button is pulled out.

(Continued on next page)

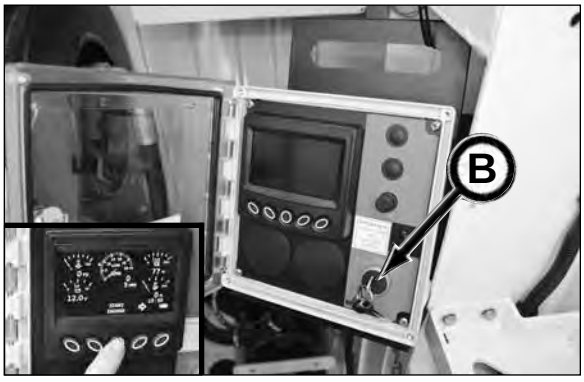
NOTICE Do not operate starter for more than 20 seconds at a time. Doing so may cause the starter to overheat.

4. (SN FA40040F-04 & Before) Turn the key switch (A) clockwise to the START position. When the engine starts, release the key so it returns to the RUN position.



SN FA40040F-04 & Before

4. (SN FA40040F-05 & After) Turn key switch (B) CCW to MAN (Manual) position. Push START ENGINE soft key button; the engine will crank. When the engine starts, release the soft key button.

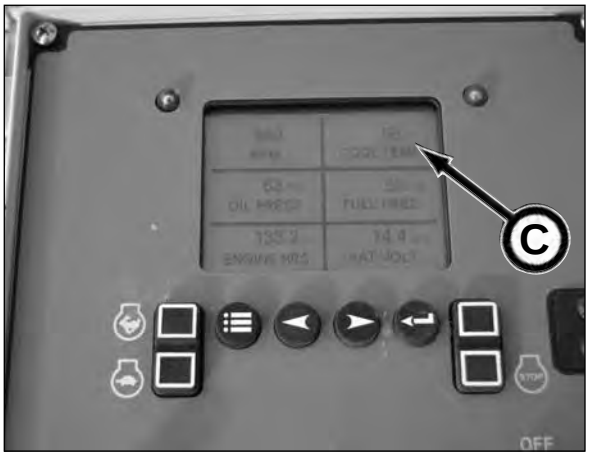


SN FA40040F-05 & After

5. After engine starts, idle engine at no more than 800 rpm until warm.

6. Watch coolant temperature reading (C). Do not place engine under full load until it is properly warmed up.

7. Check all readings for normal engine operation while using the GBM. If operation is not normal (refer to your engine Operator's Manual), stop the engine and determine the cause.



SN FA40040F-04 & Before

NOTICE For the cooling pump to operate, the hydraulic oil temperature must be over the set point temperature of the temperature switch, engine must be running over 1,000 RPM and both jacking and rotation pump pressures are less than 1,000 PSI. The cooling pump will not operate when the engine is at idle.

SN FA40040F-05 & After

STOPPING THE ENGINE

NOTICE Before stopping an engine that has been operating at high engine speed, idle engine at least two minutes to cool hot engine parts.

1. Run engine at 800 rpm for at least two minutes to cool.

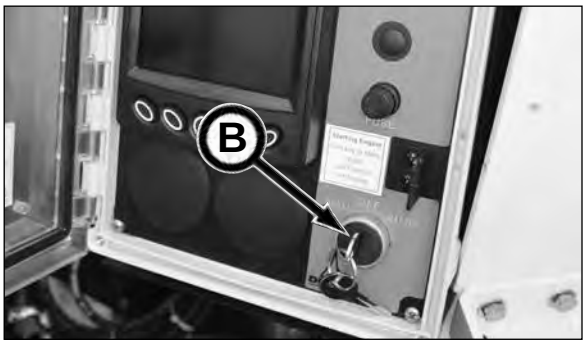
2. (SN FA40040F-04 & Before) Turn key switch (A) counterclockwise to the OFF position to stop the engine.

SN FA40040F-04 & Before

2. (SN FA40040F-05 & After) Push STOP ENGINE soft key button; the engine will shutdown.

   Turn key switch (B) to OFF position.

SN FA40040F-05 & After



SN FA40040F-05 & After

3. Remove ignition key to prevent any accidental starting.

CHECK HYDRAULICS AFTER ENGINE START-UP

⚠WARNING Escaping oil or other fluids under pressure can penetrate your skin causing serious injury or death.

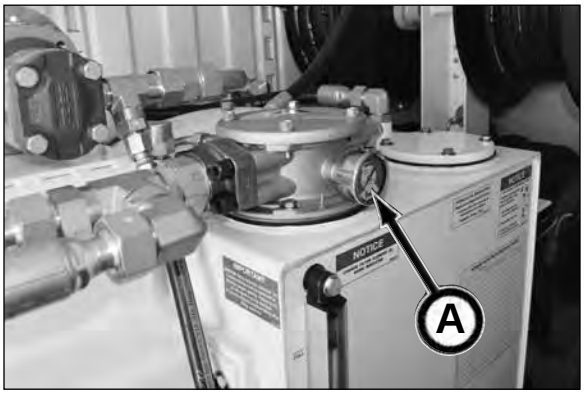
Release all pressure before performing maintenance or repairs, Never weld near pressurized fluid lines.

DO NOT use your hands to check for leaks. When searching for leaks, use a piece of wood or cardboard.

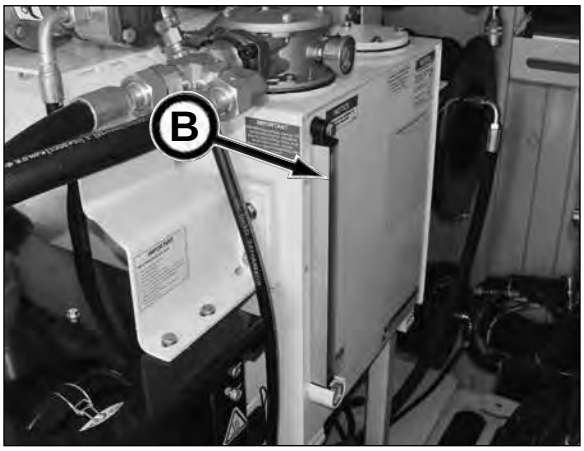
Contact medical help immediately if any oil or fluid is injected into your skin. A serious infection or reaction can emerge without proper medical treatment.

1. Check return filter indicator (A). Once operating temperature reaches at least 100°F (38°C), if the filter indicator needle is in the red CHANGE zone, replace filter. Refer to section 9, Periodic Maintenance for filter replacement instructions.

2. Check hydraulic components and hoses for leaks. Repair or replace as needed.



3. Check hydraulic reservoir oil level (B). Add as needed. Refer to Power Pack Hydraulic Oil Reservoir Lubricant in section 8, Fuels & Lubricants for the proper oil specification.



ADJUSTING THRUST PRESSURE

NOTICE To protect your product pipe, you must be sure the product pipe rating can withstand the thrust pressure of the GBM. The factory setting is 5,000 psi (34.474 mPa). If your pipe is rated lower than 5,000 psi (34.474 mPa), the GBM thrust pressure must be adjusted. **Failure to do so WILL break the pipe.**

1. Check the thrust pressure rating for your product pipe.

2. Calculate the pressure limit for your product pipe based on every 1000 psi is equal to 20 tons of thrust pressure. Or refer to the thrust pressure chart (to the right or the decal on the GBM).

GBM 240A
SN: FA40027F-55 & Before

GBM 308A
SN: FA40032F-22 & Before

GBM 339A
SN: FA43500F-06 & Before

GBM240				
PRESSURE PSI	CYLINDER LOAD IN TONS		DRIVE TORQUE IN Ft / lbs	
	EXTEND	RETRACT	LSHT	HSLT
250	4.9	2.5	499	197
500	9.8	5.0	998	393
750	14.8	7.5	1497	590
1000	19.7	10.0	1996	786
1250	24.6	12.5	2495	983
1500	29.5	15.0	2994	1179
1750	34.4	17.5	3493	1376
2000	39.4	20.0	3992	1573
2250	44.3	22.5	4491	1769
2500	49.2	25.0	4990	1966
2750	54.1	27.5	5489	2162
3000	59.1	30.0	5988	2359
3250	64.0	32.5	6487	2555
3500	68.9	35.1	6986	2752
3750	73.8	37.6	7485	2949
4000	78.7	40.1	7984	3145
4250	83.7	42.6	8483	3342
4500	88.6	45.1	8982	3538
4750	93.5	47.6	9481	3735
5000	98.4	50.1	9980	3932

GBM 240A
SN: FA40027F-56 & After

GBM 308A
SN: FA40032F-23 & After

GBM 339A
SN: FA43500F-07 & After

GBM240A/308A/339A				
PRESSURE PSI	CYLINDER LOAD IN TONS		DRIVE TORQUE IN Ft / lbs	
	EXTEND	RETRACT	LSHT	HSLT
250	4.9	2.5	530	353
500	9.8	5.0	1060	706
750	14.8	7.5	1590	1059
1000	19.7	10.0	2121	1413
1250	24.6	12.5	2651	1766
1500	29.5	15.0	3181	2119
1750	34.4	17.5	3711	2472
2000	39.4	20.0	4241	2825
2250	44.3	22.5	4771	3178
2500	49.2	25.0	5301	3531
2750	54.1	27.5	5831	3884
3000	59.1	30.0	6361	4239
3250	64.0	32.5	6891	4592
3500	68.9	35.1	7421	4945
3750	73.8	37.6	7951	5298
4000	78.7	40.1	8481	5652
4250	83.7	42.6	9015	6006
4500	88.6	45.1	9545	6359
4750	93.5	47.6	10075	6712
5000	98.4	50.1	10605	7065

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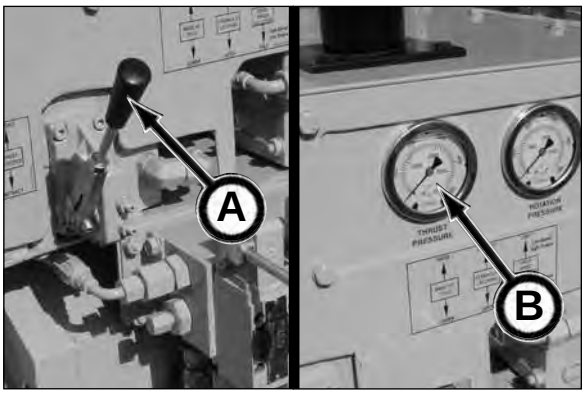
(Continued on next page)

3. With the power pack hydraulic hoses connected to the GBM and the power pack engine running, fully retract the GBM jacking cylinders by using the thrust cylinder control (A).

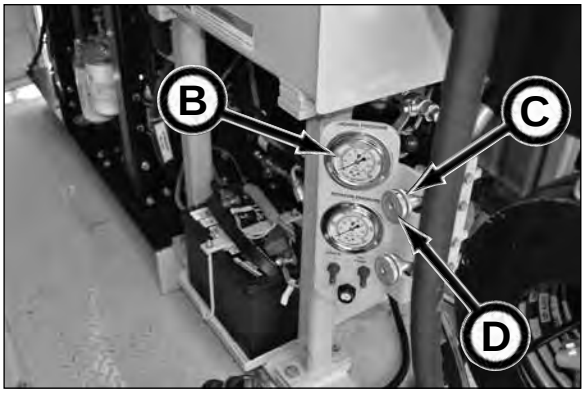
4. Check the thrust pressure on the GBM pressure gauge (B) or power pack. Operating pressure is checked by retracting the jacking cylinders and holding lever after the cylinder base has stopped moving. Observe pressure on gauge.



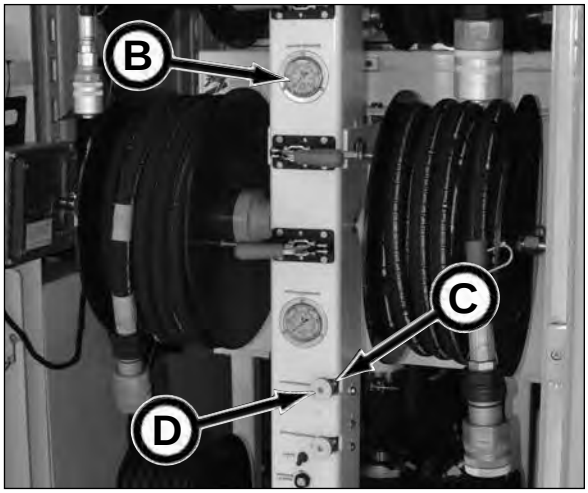
NOTICE Only a qualified service technician is allowed to perform pressure adjustments to the power pack.

If the pressure needs to be decreased, loosen lock collar (C) and turn adjustment dial (D) OUT. Once the pressure is properly adjusted, tighten lock collar.

If the pressure needs to be increased, loosen lock collar (C) and turn adjustment dial (D) IN. Once the pressure is properly adjusted, tighten lock collar.



SN FA40040F-03 & Before



SN FA40040F-04 & After

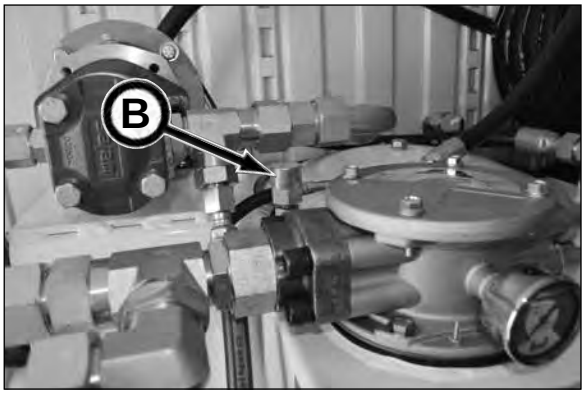
FILLING THE HYDRAULIC OIL RESERVOIR

Check hydraulic tank oil level gauge (A).

If the fluid level in the reservoir is less than 3/4 full, fill the reservoir with ISO-VG-46 Premium Hydraulic Turbine Oil as follows:

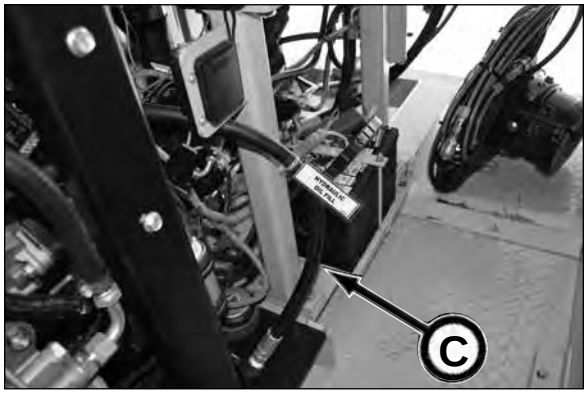
1. Retract thrust cylinders on GBM frame.

2. Shut down engine.



IMPORTANT: BEFORE filling hydraulic reservoir, the breather/fitting must be removed to allow for proper venting. Failure to do so will result in pump damage. Be sure to replace breather/fitting after filling reservoir.

3. Remove breather/fitting (B) from reservoir BEFORE filling reservoir to allow for proper venting during filling process.



4. Remove hydraulic oil fill hose (C) from storage location. Remove cap from hose.

5. Place hose into clean hydraulic oil container.

NOTICE Refer to Fuels & Lubricants section for recommended hydraulic oil.

(Continued on next page)

5. Flip Oil Fill Pump switch to the ON position to pump hydraulic oil into the hydraulic reservoir.

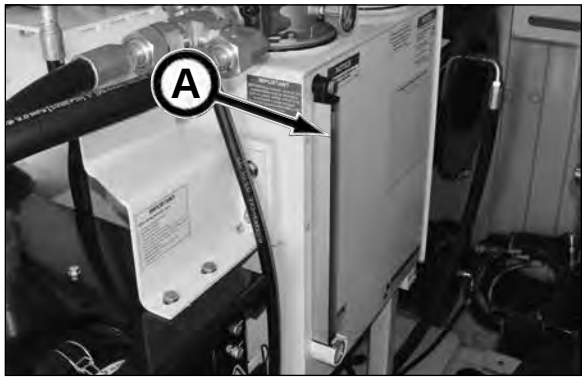
SN FA40040F-03 & Before

SN FA40040F-04 & After

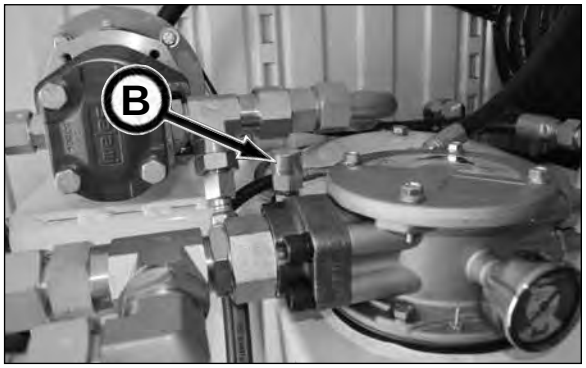
6. Fill until oil reaches the high mark on gauge (A).

NOTICE Be sure the GBM frame thrust cylinders are retracted.

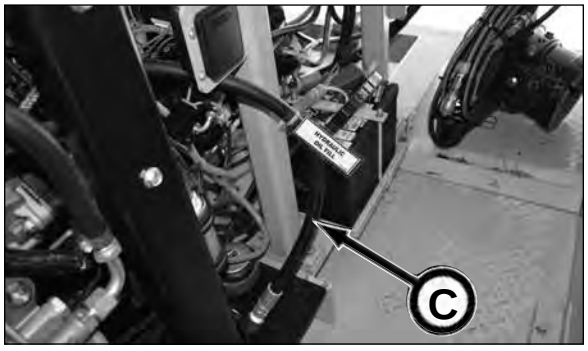
7. Flip the Oil Fill Pump switch to the OFF position.



8. Replace breather/fitting (B) on reservoir.



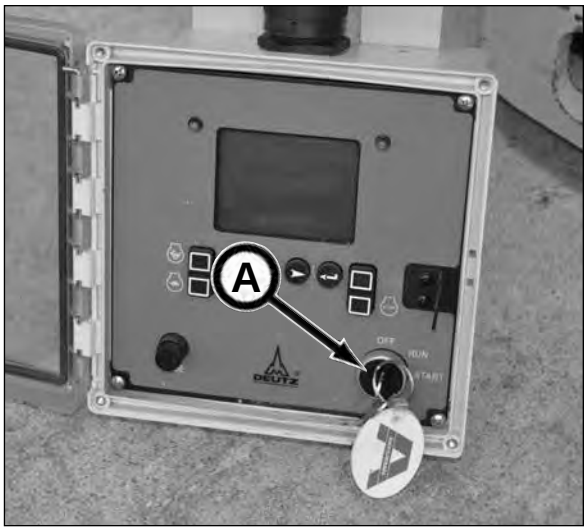
9. Replace cap on fill hose (C) and place hose in storage location.



DAILY SHUTDOWN

1. Shutdown engine.

   (SN FA40040F-04 & Before) Turn key switch (A) counterclockwise to the OFF position to stop the engine.



SN FA40040F-04 & Before

   (SN FA40040F-05 & After) Push STOP ENGINE soft key button; the engine will shutdown.

   Turn key switch (B) to OFF position.

SN FA40040F-05 & After

SN FA40040F-05 & After

2. Push IN E-Stop button (C) to prevent unintended startup.

Transporting

TRANSPORTING GUIDELINES

1. Know the local, state, and federal transportation regulations.

2. Obtain required permits for transporting.

3. Remove any obstacles from the trailer floor.

4. Clean debris from machine.

5. Load and unload on level ground.

6. If lifting equipment with a hoist or lifting device, the equipment lifting eyes and sling must be inspected for damage before lifting. If damaged, replace.

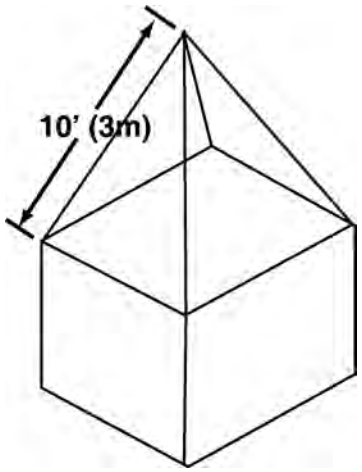
7. Use chains to fasten the guided boring machine and power pack to trailer floor.

8. Securely fasten all tooling to trailer floor.

9. Observe all lifting capacities and lifting instructions.

LIFTING INSTRUCTIONS

- Container weight is 8,000 lbs. (3,629 kg)
- Lifting with a crane requires a four part sling with legs a minimum of 10 ft. (3 m) long.
- Container must lift freely. If it is stuck to the ground, it must be broken loose prior to lifting.
- Lifting eyes must be inspected prior to each lift. Any damage must be repaired prior to lifting.



NOTES

Fuels & Lubricants

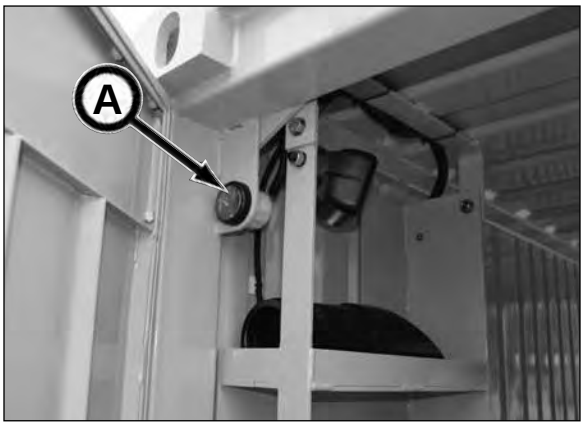
FUEL SPECIFICATIONS

NOTICE For more information on maintaining the fuel and additional fuel specifications, refer to your engine manual.

Diesel fuels specified to EN 590 or ASTM D975 (No. 1-D, 2-D) are recommended.

Refer to your engine manual for other fuel requirements.

Fuel tank capacity is 50 gal. (189 L).



A fuel gauge (A) is located at the hydraulic hose reel end of the power pack.

ENGINE OIL

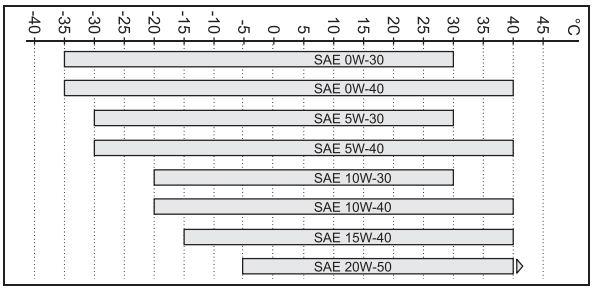
NOTICE For more information on the engine oil specifications, refer to your engine manual.

Change the oil and filters after the first 50 hours of operation, then every 250 hours thereafter with SAE engine oil or other oil viscosity based on the expected air temperature range during the period between oil changes as shown in the charts.

Other oils may be used (refer to engine manual).

Deutz Engine
The engine is filled with SAE 15W-40 engine oil. When changing oil and filters, use SAE 15W-40 engine oil or other oil viscosity as shown in the chart.

The engine oil capacity is approximately 8.45 qt. (8 L). Oil level must always be between the MIN and MAX marks. Do not overfill!



Deutz Engine Oil Specification Chart

ENGINE COOLANT

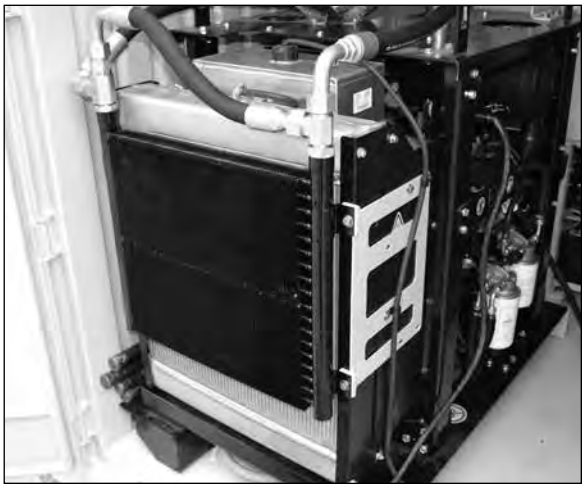
NOTICE For more information on the engine coolant specifications, refer to your engine manual.

⚠WARNING Cooling system under pressure. Explosive release of HOT engine coolant can cause severe burns. SLOWLY remove the radiator cap ONLY if the engine is cool.

The engine radiator coolant is a 50% mixture of ethylene glycol engine coolant and distilled, deionized, or demineralized water.

This mixture provides protection against corrosion and cylinder liner pitting, and winter freeze protection to -34°F (-37°C). If protection at lower temperatures is required, contact your engine dealer for recommendations.

NOTICE Refer to your engine manual for information on using a cooling system corrosion protection agent in your cooling system.



POWER PACK HYDRAULIC OIL RESERVOIR LUBRICANT

The power pack oil reservoir is typically filled with ISO-VG-46 Premium Hydraulic/Turbine Oil.

Use an API GL-1/GL-2 or equivalent when adding or changing lubricant.

NOTICE If using a too heavy of viscosity oil in cold temperatures, hydraulic oil pump damage could result due to pump cavitation. On the contrary, using ISO 32 or 46 oils above 150°F operating temperatures (oil temp. in reservoir) will result in reduced hydraulic power to functions.

Recommended hydraulic oil:

Ambient Temp.	**Hydraulic Oil**
-25°F to 60°F (-32°C to 16°C)	ISO 32
0°F to 95°F (-18°C to 35°C)	ISO 46
32°F to 105°F (-0°C to 41°C)	ISO 68

NOTICE If you change to a different oil, use a reputable oil supplier to meet or exceed the ISO-VG-46 or API GL-1/GL-2 oil specification. Do not mix oil manufacturers or grades.

STORING LUBRICANTS

Your equipment can operate at maximum performance only if clean lubricants are used. Use clean containers to handle all lubricants.

Lubricants should be stored in an area protected from dust, moisture, and other contaminates.

NOTES

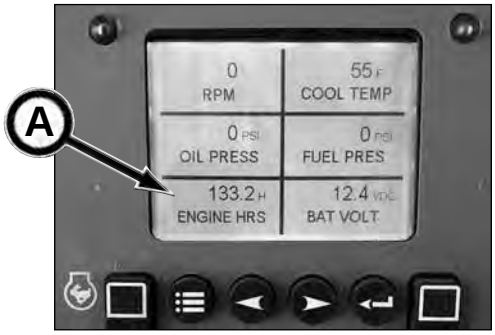
Periodic Maintenance

⚠WARNING Review the Safety section in this supplement and your GBM Operator's Manual before performing maintenance. Failure to do so, could cause severe injury or death.

LUBRICATION & MAINTENANCE INTERVALS

The requirements for lubrication and maintenance are shown on the maintenance charts in this section. Intervals of maintenance are based on normal operating conditions. If operating under more difficult conditions, use a shorter time interval between maintenance.

Use the power pack engine hourmeter (A) to determine the proper lubrication and maintenance intervals.



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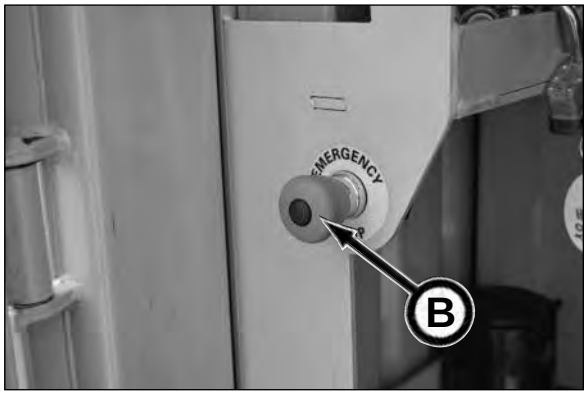
SN FA40040F-05 & After

USING EMERGENCY STOP

Push Emergency Stop button (B) IN to stop all electrical and hydraulic functions.

The button will illuminate when it is pulled OUT.

This button must be pulled out to restart engine.



LOCKOUT TAGOUT POWER BEFORE SERVICING

⚠WARNING Severe personal injury or death can result from unexpected power unit start-up or machine movement.

LOCKOUT TAGOUT power before attempting to make repairs or adjustments to this equipment, unless otherwise indicated. Proper lockout tagout will prevent accidents and save lives. Performing the lockout tagout will also prevent the equipment from moving or operating unexpectedly.

HYDRAULIC OIL/FLUIDS UNDER PRESSURE

⚠WARNING Escaping oil or other fluids under pressure can penetrate your skin causing serious injury.

Release all pressure before performing maintenance or repairs. Never weld near pressurized fluid lines.

DO NOT use your hands to check for leaks. When searching for leaks, use a piece of wood or cardboard.

Contact medical help immediately if any oil or fluid is injected into your skin. A serious infection or reaction can emerge without proper medical treatment.

AVOID PINCH POINTS

⚠WARNING Moving parts or the mishandling of parts can cause severe personal injury.

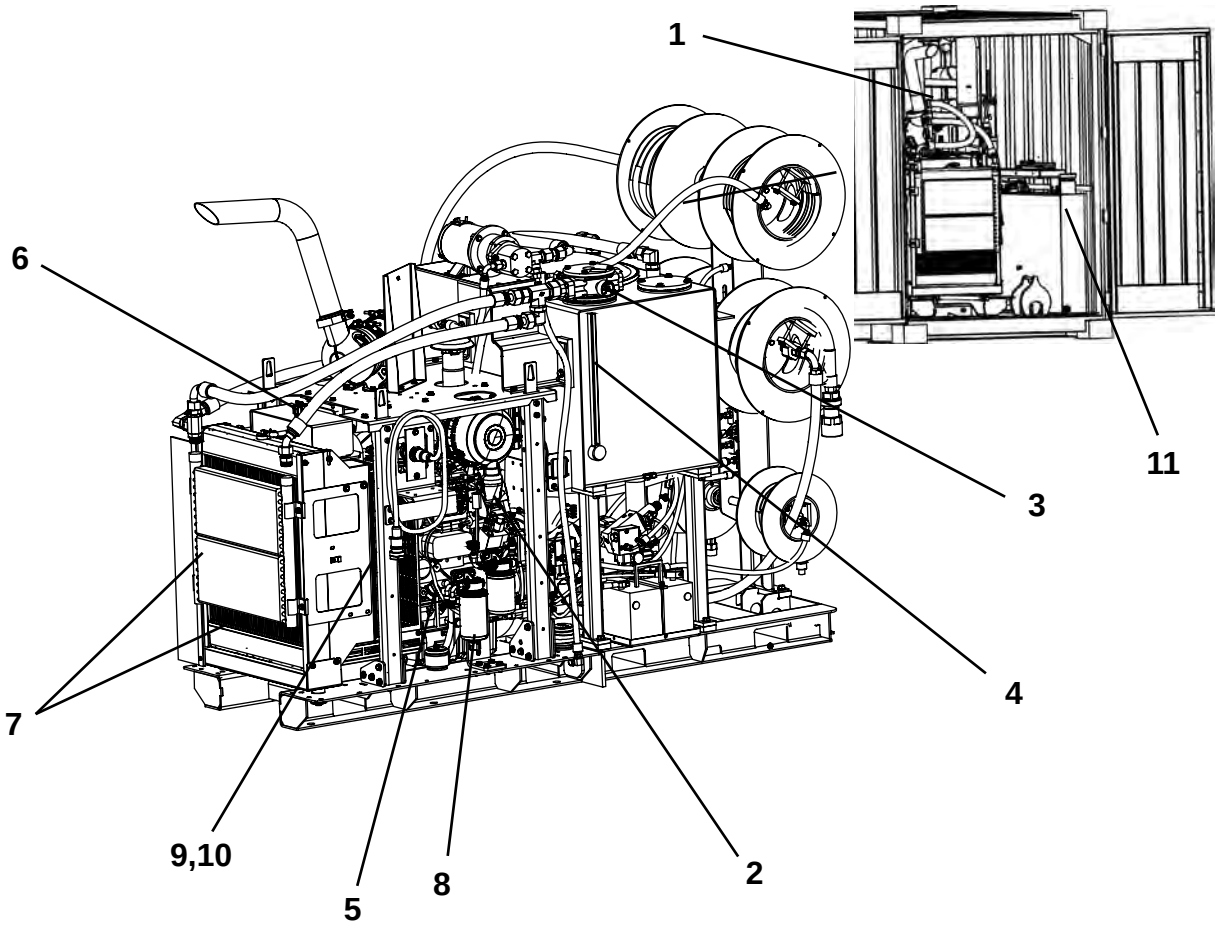
Keep hands away from moving parts.

Watch your fingers, hands, and legs while equipment is in operation.

Handle parts carefully to avoid crushing and pinch point hazards.

MAINTENANCE CHART - P4075D

NOTICE Use the item number in the chart to refer to the detailed maintenance procedures later in this section.

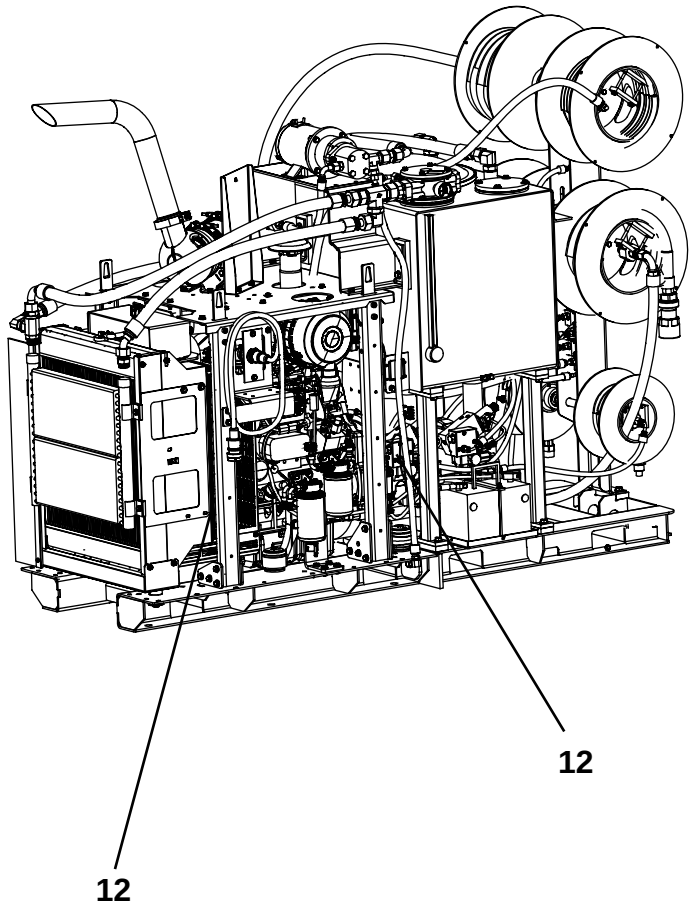


*DAILY OR EVERY 10 HOURS OF OPERATION

ITEM	COMPONENT	SERVICE	REQUIREMENT	MATERIAL
1.	Power Pack**	Visual Inspection	If parts are damaged or missing, replace.	
2.	Air Cleaner Dust Unloader	Clean Out		
3.	Hydraulic Return Filter	Check Indicator	Replace filter as needed per indicator.	Return Filter
4.	Hydraulic Reservoir	Check Fluid Level	Add hydraulic fluid as needed.	ISO-VG Fluid
5.	Engine Crankcase**	Check Oil Level	Add oil as needed.	See Section 8
6.	Radiator	Check Coolant Level	Add coolant as needed.	Coolant
7.	Radiator/Oil Cooler	Clean	As needed.	
8.	Fuel/Water Separator	Drain Water	Drain until fuel is visible.	
9.	Fan	Inspect Fan & Guard	If damaged, replace with new.	
10.	Belt	Inspect	If damaged, replace with new.	
11.	Fuel Tank	Check Fuel Level	Add diesel fuel as needed.	Diesel Fuel

*** Refer to your engine manual for additional engine maintenance information.**

** During engine break-in period, change the oil and filter for the first time at 50 hours of operation.

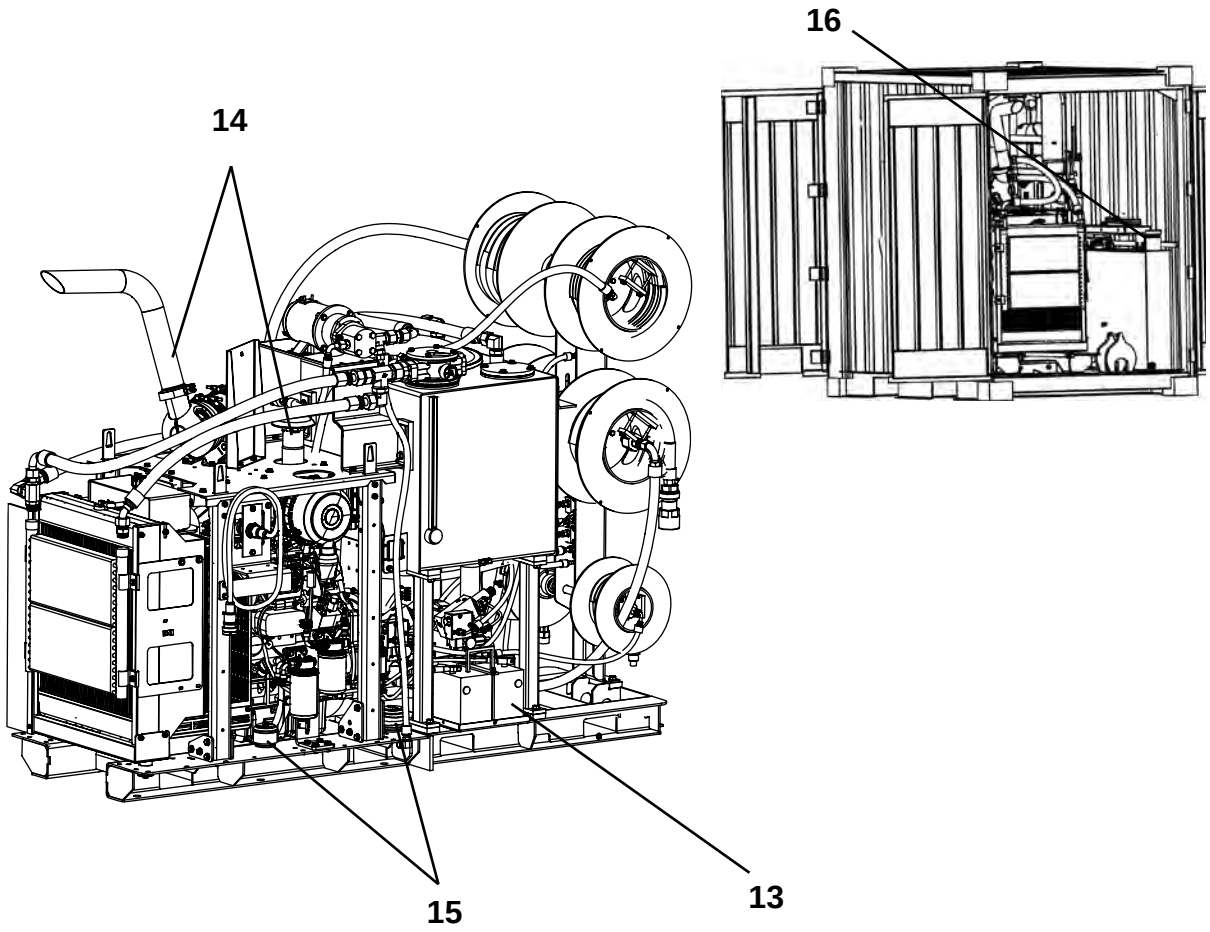


*FIRST 50 HOURS OF OPERATION & EVERY 250 HOURS THEREAFTER

ITEM	COMPONENT	SERVICE	REQUIREMENT	MATERIAL
**12.	Engine Crankcase	Drain & Fill & Filter	Replace with new oil & filter.	See Section 8

*** Refer to your engine operation manual for additional maintenance information.**

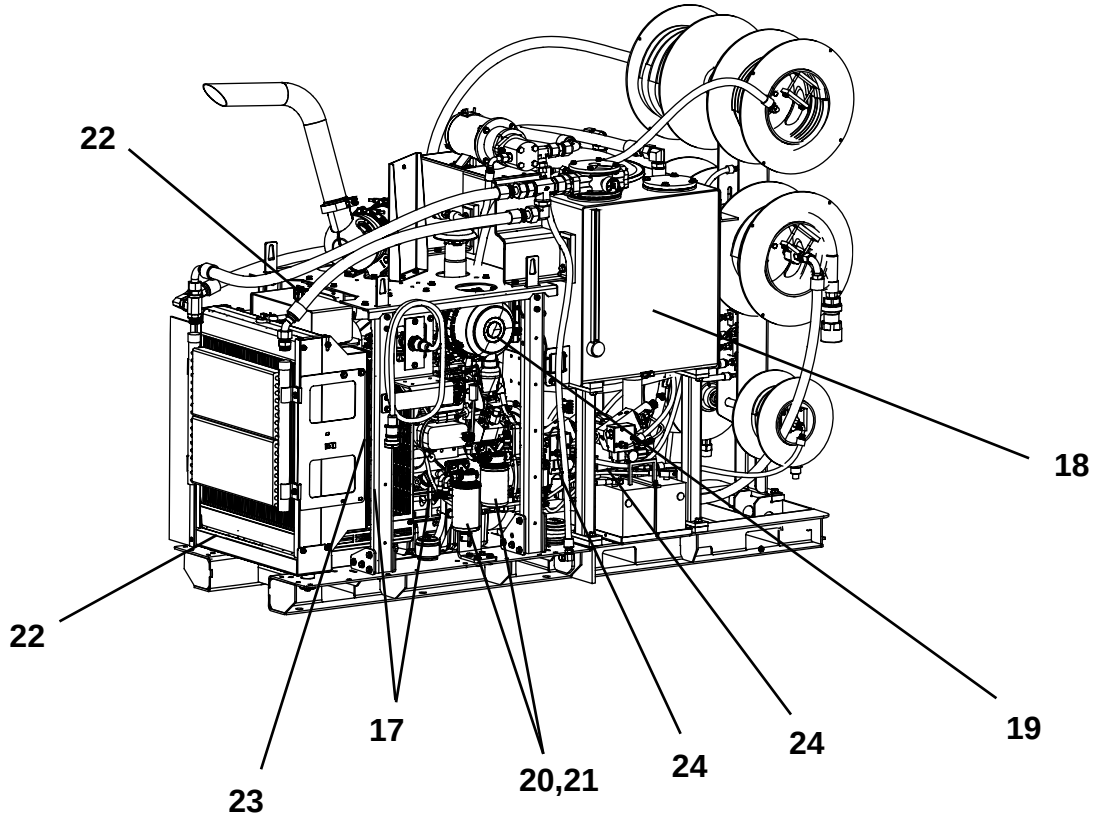
** During engine break-in period, change the oil and filter for the first time at 50 hours of operation.



*MONTHLY OR EVERY 250 HOURS OF OPERATION

ITEM	COMPONENT	SERVICE	REQUIREMENT	MATERIAL
13.	Battery	Inspect	Check for damage or frayed cables.	Battery/Cable
14.	Air Intake & Exhaust System	Inspect All Connections	Repair or replace as needed.	
15.	Engine Mounts	Inspect	Replace as needed.	
16.	Fuel Tank Cap	Inspect & Clean	Replace if damaged.	

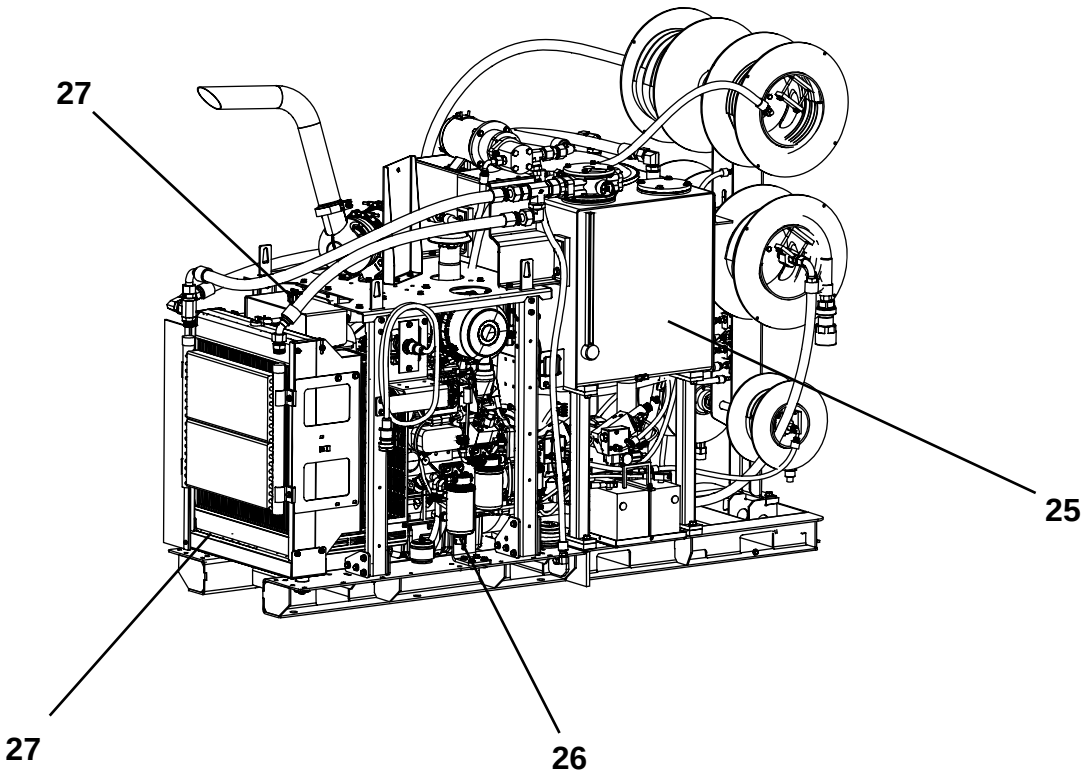
*** Refer to your engine manual for additional engine maintenance information.**



*EVERY 500 HOURS OF OPERATION

ITEM	COMPONENT	SERVICE	REQUIREMENT	MATERIAL
17.	Engine Oil/Filter	Drain & Replace	Replace with new oil and filter.	See Section 8
18.	Hydraulic Reservoir	Drain & Fill	Drain and fill with new oil.	ISO-VG-46 20W
19.	Air Cleaner	Install New		Element(s)
20.	Fuel System	Replace Fuel Filter		Fuel Filters
21.	Fuel System	Bleed Fuel System	See engine manual.	
22.	Cooling System	Check Condition	Coolant touches bottom of filler neck.	Water/Anti-Freeze
23.	Belt & Belt Tensioner	Check		
24.	Load Sense Filters	Replace (2 places)	Replace with new.	LS Filters

*** Refer to your engine manual for additional engine maintenance information.**



COMPLETION OF EACH DRIVE

ITEM	COMPONENT	SERVICE	REQUIREMENT	MATERIAL
25.	Hydraulic Reservoir	Drain water	Drain until water is removed.	

*EVERY 1000 HOURS OF OPERATION

ITEM	COMPONENT	SERVICE	REQUIREMENT	MATERIAL
26.	Fuel Pre-Filter	Replace	Refer to engine manual.	Filter Insert

*** Refer to your engine manual for additional engine maintenance information.**

*EVERY 2000 HOURS OF OPERATION

ITEM	COMPONENT	SERVICE	REQUIREMENT	MATERIAL
27.	Cooling System	Flush & Fill	Refer to engine manual.	Water/Anti-Freeze

*** Refer to your engine manual for additional engine maintenance information.**

DAILY OR EVERY 10 HOURS OF OPERATION

1. VISUALLY INSPECT EQUIPMENT

Perform a visual inspection of the power pack. Inspect structures, mountings and lubricant levels.

Immediately report any structural problems to your Akkerman aftermarket support representative.

Check for oil leaks and debris buildup. Make repairs as needed and remove debris.

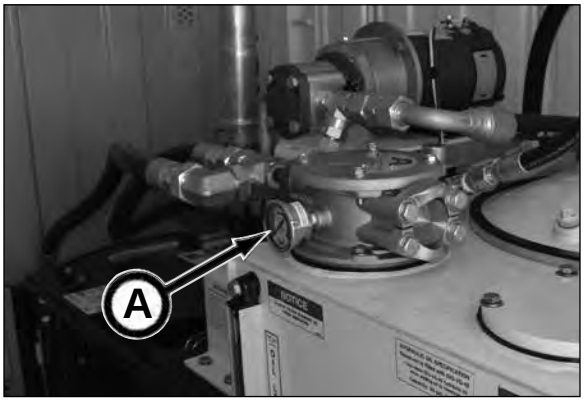
Check for loose, damaged, or missing parts. Repair or replace as necessary. Replace any defective parts.

Tighten hardware as needed. Do not overtighten hardware.

2. CLEAN OUT DUST UNLOADER VALVE

Squeeze air cleaner dust unloader valve on air cleaner assembly to release any trapped dirt particles. If the sealing tip of the valve is damaged, life of the air filter elements will be greatly reduced.

3. CHECK HYDRAULIC RETURN FILTER INDICATOR



To prevent over or under servicing of the hydraulic return filter, a filter indicator (A) has been installed on the hydraulic return filter housing.

Always check gauge when the oil is at normal operating temperature and the system is at normal operating flow. Otherwise, the gauge may indicate a false reading.

The filter and oil require replacement if any of the following situations occur:

- A major component fails.
- Any sign of water contamination from an oil analysis or if oil is milky or foaming.
- A hydraulic oil sample indicates large particle contamination.

The green OK zone indicates that the filter is functioning properly.

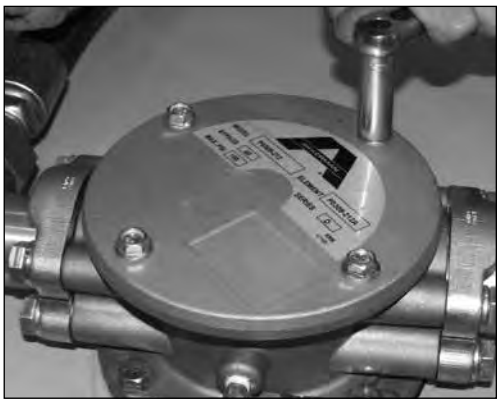
The yellow zone indicates that the filter will soon require replacement.

When the needle on the gauge is in the red CHANGE zone, replace filter as soon as possible to prevent hydraulic component damage using the following procedure.

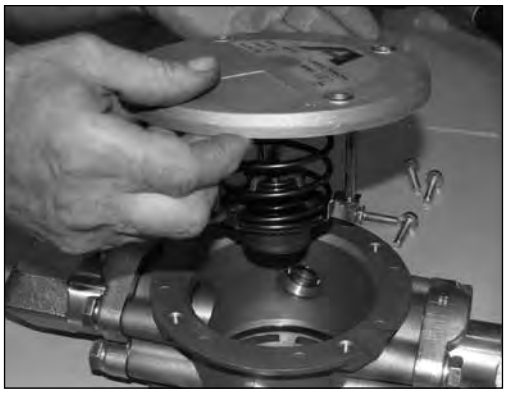
(Continued on next page)

1. With power pack shutdown, clean and dry area around the filter head assembly.

2. Remove filter head fasteners and retain for later use.



3. Remove head assembly from housing.



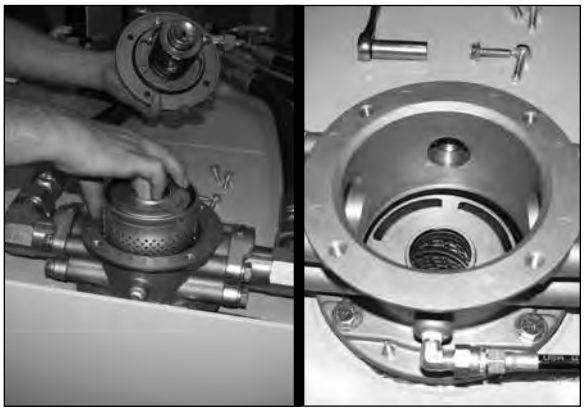
4. Remove filter.

5. Check for metal flakes on filter. If metal flakes are visible, replace all filters and reservoir oil.

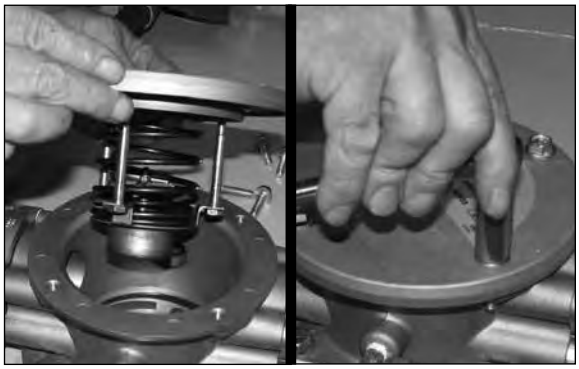
6. Dispose of filter properly.

(continued on next page)

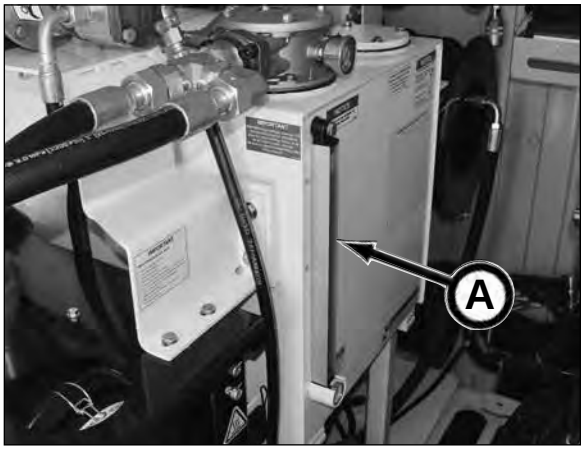
7. Check filter gasket in filter head. If worn or damaged replace with new. Install new gasket (if needed) with a light coat of clean hydraulic oil into filter head. Be sure the gasket is not twisted and is correctly in place.



8. Carefully install new filter into filter housing until it is fully seated into housing.



9. Replace filter head assembly onto housing and secure with fasteners removed in step 2.



10. With the hydraulic hoses disconnected from the GBM, start engine and run at low idle until the hydraulic system is warm. Then check for leaks.

11. Shut down engine. Check for leaks.

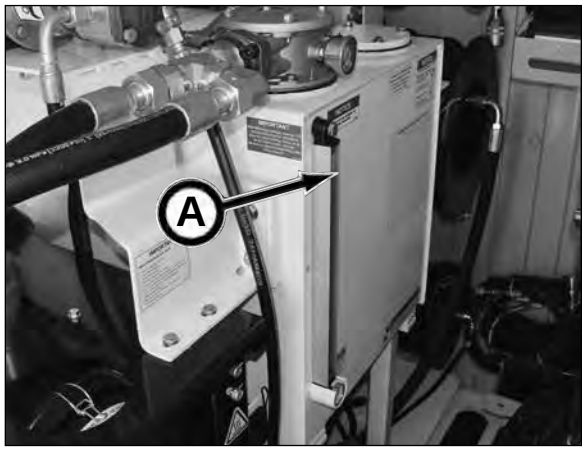
12. Check hydraulic reservoir oil level on gauge (A). Add hydraulic oil, if necessary.

4. CHECK HYDRAULIC RESERVOIR OIL LEVEL & CONDITION OF OIL

1. Check reservoir hydraulic oil for the following:

   a. Check for oil bubbles or foaming oil. This may indicate an air leak in the system.
   b. Check for milky oil. This indicates that there is water in the system. Be sure your oil is being properly stored.
   c. Large particle contamination from oil sample.

If any of these conditions are found, the reservoir must be drained, cleaned, and refilled with new, clean hydraulic oil and the hydraulic filter must be replaced. Refer to Every 500 Hours of Operation, "18. Drain & Fill Hydraulic Reservoir" in this section.



2. Retract thrust cylinders on GBM frame.

3. Check hydraulic tank oil level gauge (A).

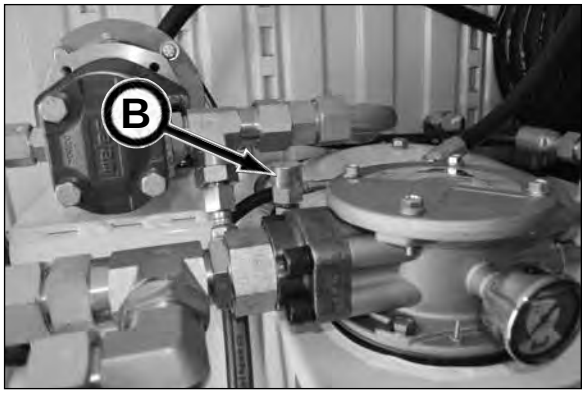
FILLING RESERVOIR

If the fluid level in the reservoir is less than 3/4 full, fill the reservoir with an ISO-VG Premium Hydraulic Turbine Oil (refer to Power Pack Hydraulic Oil Reservoir Lubricant in section 8, Fuels & Lubricants for recommended oil per ambient temperature) as follows:

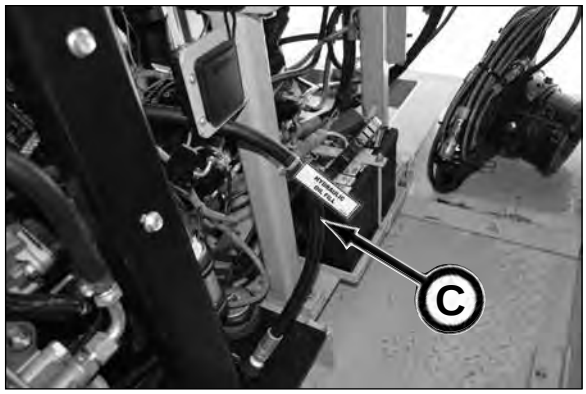
1. Retract thrust cylinders on GBM frame.

2. Shut down engine.

IMPORTANT: BEFORE filling hydraulic reservoir, the breather/fitting must be removed to allow for proper venting. Failure to do so will result in pump damage. Be sure to replace breather/fitting after filling reservoir.



3. Remove breather/fitting (B) from reservoir BEFORE filling reservoir to allow for proper venting during filling process.



4. Remove hydraulic oil fill hose (C) from storage location. Remove cap from hose.

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5. Place hose into CLEAN hydraulic oil container.

NOTICE Refer to Fuels & Lubricants section for recommended hydraulic oil.

6. Flip Oil Fill Pump switch to the ON position to pump hydraulic oil into the hydraulic reservoir.

SN FA40040F-03 & Before

SN FA40040F-04 & After

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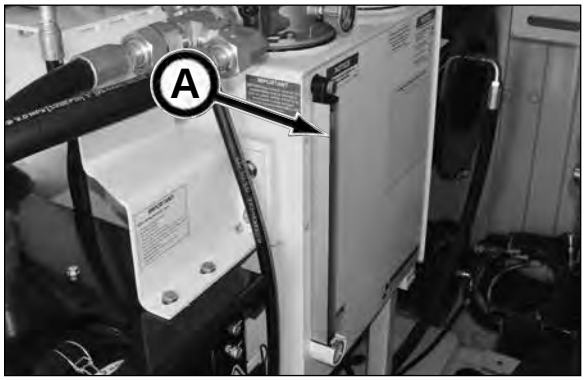
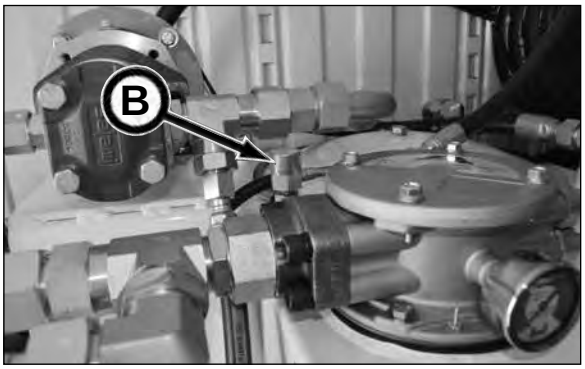
7. Fill until oil reaches the high mark on gauge (A).



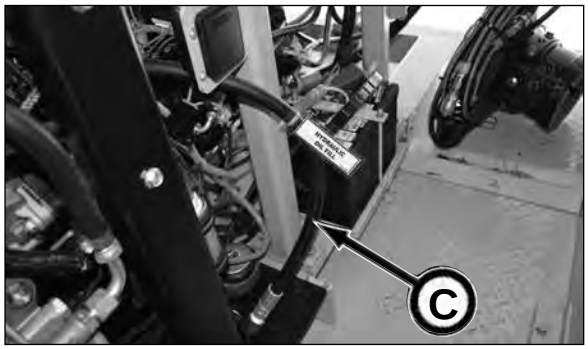
NOTICE Be sure the GBM frame thrust cylinders are retracted.

8. Flip Oil Fill Pump switch to the OFF position.

9. Replace breather/fitting (B) on reservoir.



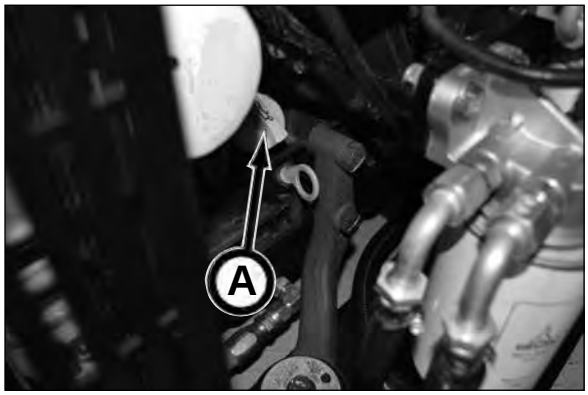
10. Replace cap on fill hose (C) and place hose in storage location.



5. CHECK ENGINE CRANKCASE OIL LEVEL

Check engine oil level on dipstick. Do not fill above the top mark on the dipstick.

Oil level must always be between the MIN and MAX marks on the dipstick. DO NOT OVERFILL!



If necessary, add engine oil. Remove fill cap (A). Replace cap when complete.

See Engine Oil in section 8, Fuels & Lubricants for the proper oil specification.

NOTICE During engine break-in, change the oil and filter for the first time at 50 hours of operation.

6. CHECK ENGINE COOLANT LEVEL

⚠WARNING Cooling system under pressure. Explosive release of HOT engine coolant can cause severe burns.

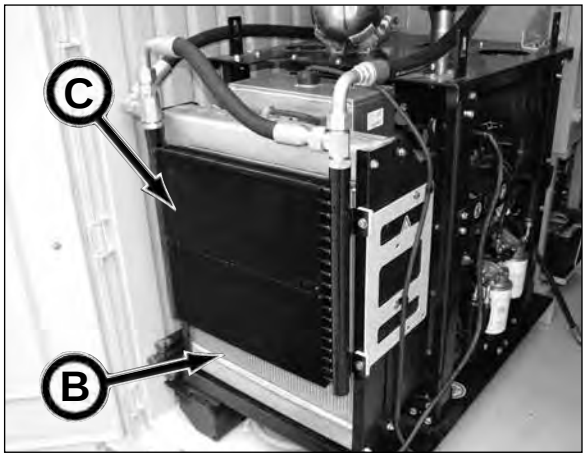
SLOWLY remove the radiator cap ONLY if the engine is cool. DO NOT remove the radiator cap when the engine is hot.

Check coolant level when engine is cold. Coolant level should be at bottom of filler neck (A) on the overflow reservoir. If coolant level is low, fill radiator through the overflow reservoir with proper coolant solution.

See Engine Coolant in section 8, Fuels & Lubricants for proper coolant specification. Be sure to check levels after filling. DO NOT OVERFILL.

7. CLEAN RADIATOR/OIL COOLER FINS

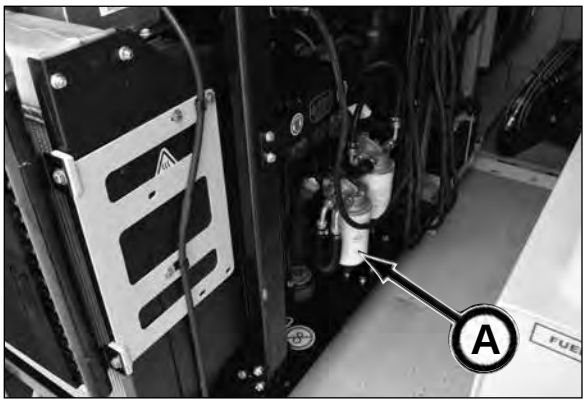
Inspect radiator (B) and oil cooler (C) fins for cleanliness. If necessary, clean radiator and oil cooler fins with compressed air (100 psi maximum).

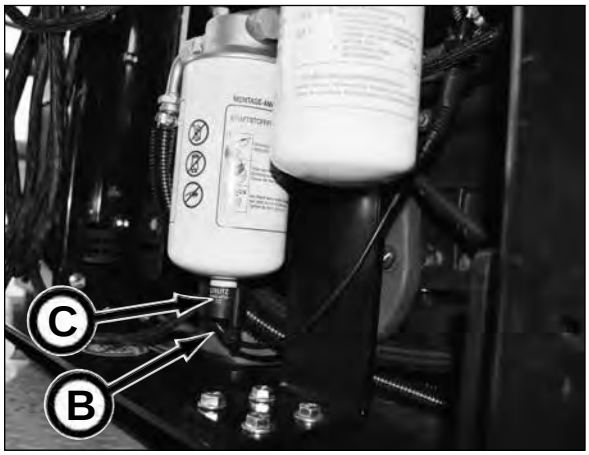


8. DRAIN FUEL/WATER SEPARATOR

NOTICE Refer to your engine manual for more information.

1. Shutdown engine.
2. Place an appropriate sized catch pan under the fuel pre-filter assembly (A).
3. Disconnect electrical cable connection (B).
4. Loosen drain plug (C).
5. Drain fluid into catch pan until no water is present and only pure diesel fuel runs out.
6. Tighten drain plug.
7. Reconnect electrical cable connection.

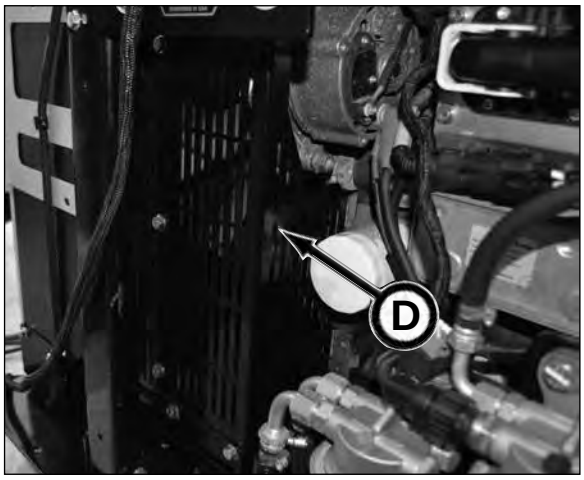




9. INSPECT FAN & FAN GUARD

⚠WARNING NEVER operate engine without fan guard in place. Serious personal injury could result if contact is made with rotating fan.

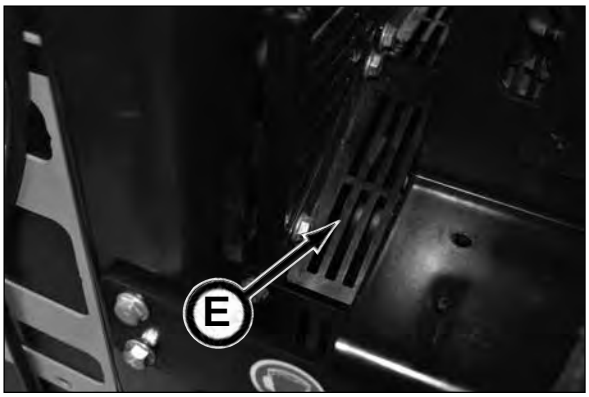
With engine shut off and key removed from control pendant to prevent accidental starting, check fan (D) for cracks, and bent or loose blades. Check fan to make sure it is properly mounted. Replace damaged fan and fan guard.



10. INSPECT BELT

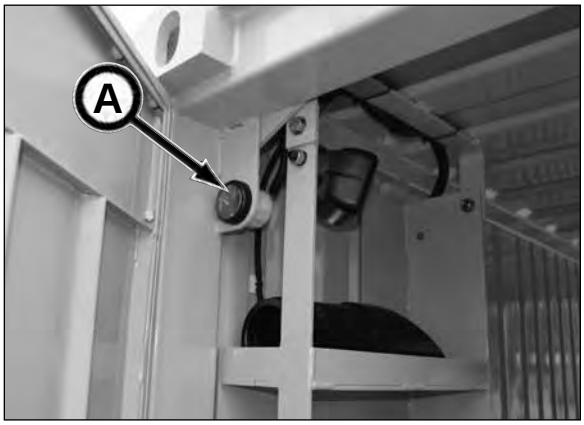
⚠WARNING NEVER operate engine without belt guard in place. Serious personal injury could result if contact is made with rotating belt.

Visually inspect the drive belt (E) for cracking, fraying or pieces of material missing. Replace belts as needed. Refer to your engine operation manual for belt replacement.



11. CHECK FUEL TANK LEVEL

Check fuel tank diesel fuel level.



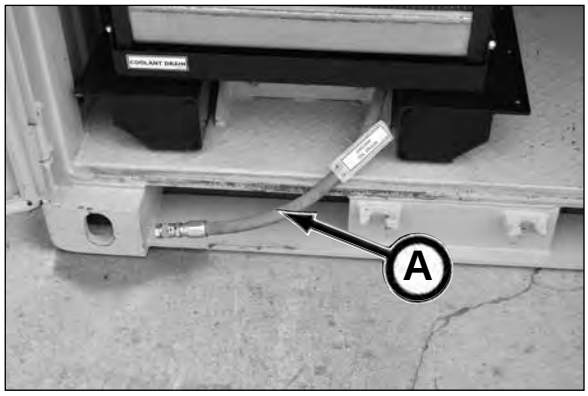
A fuel gauge (A) is located at the hydraulic hose reel end of the power pack.

FIRST 50 HOURS OF OPERATION & EVERY 250 HOURS THEREAFTER

12. CHANGE ENGINE OIL & FILTER

NOTICE Refer to your engine operation manual for more information.

1. Gain access to the engine oil drain hose (A).



2. Remove cap from hose.

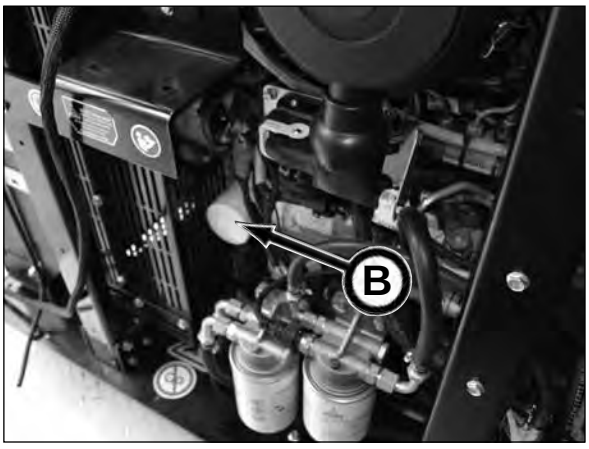
3. Drain oil into a catch pan of proper size.

4. Reinstall cap to hose.

5. Replace drain hose to storage position.

6. Clean and dry area around the oil filter (B).

7. Remove oil filter and clean filter mounting pad. Dispose of filter properly.



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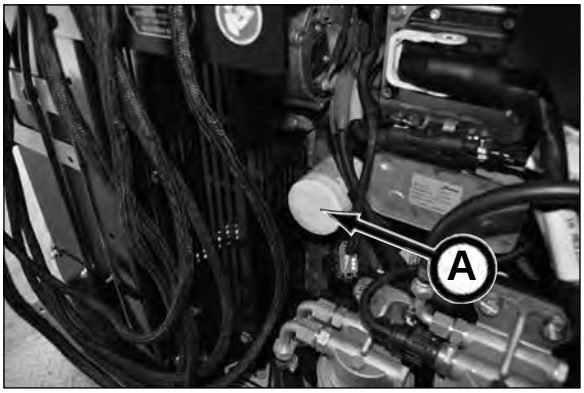
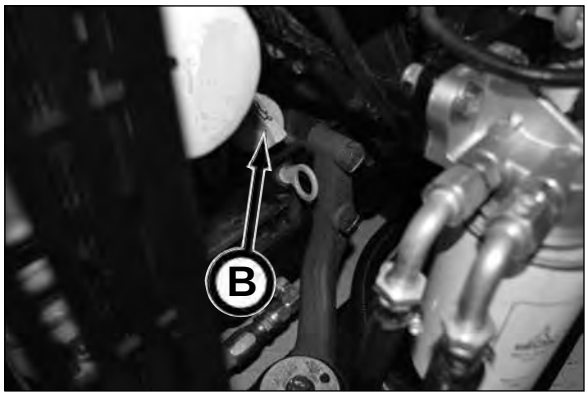


8. Lubricate gasket on new filter with clean oil.

   IMPORTANT: The new oil filter should never be prefilled. There is a danger of contamination.

9. Install new filter (A) and hand tighten according to values printed on the filter. Do not overtighten the filter element.



10. Remove fill cap (B).

11. Fill engine with engine oil specified in section 8, Fuels & Lubricants section. The following fluid capacity is an approximate value. Be sure to check level after filling. DO NOT OVERFILL.

    Oil Capacity: 8.45 qt (15 L)

12. Install fill cap. Hold and screw cap handle clockwise to tighten. Clean up spills.

13. Start engine and run until warm and check for leaks.

14. Shutdown engine. Wait approximately 5 minutes to let the oil drain from the upper portion of the engine. Check oil level. Oil level must always be between the MIN and MAX marks on the dipstick. DO NOT OVERFILL!

MONTHLY OR EVERY 250 HOURS OF OPERATION

13. CHECK BATTERY

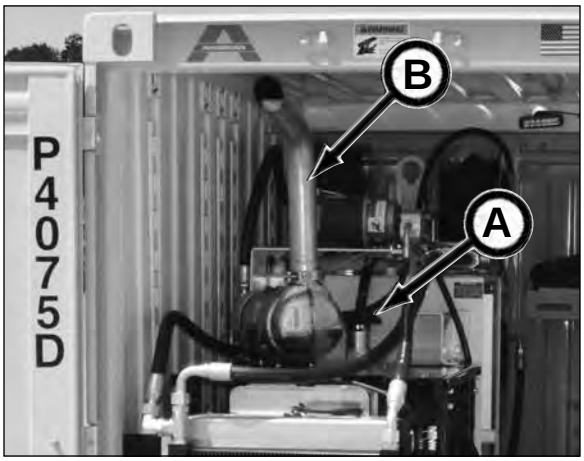
⚠WARNING Batteries product explosive gases. Wear eye protection and protective clothing during battery service. Keep sparks, flames, and cigarettes away from batteries.

Visually check the battery for damage. If damaged replace with new.

Check battery cables for damage or fraying. If damaged, replace with new.

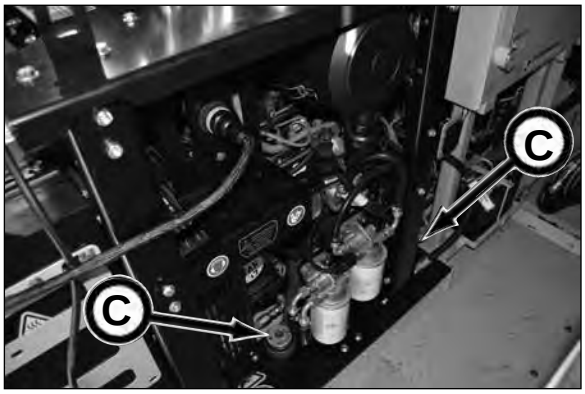
Be sure cables are secured properly to the battery posts and engine mounts.

Inspect battery mount and strap for damage. Repair or replace as needed.



14. INSPECT AIR INTAKE & EXHAUST CONNECTIONS

Inspect all air intake (A) and exhaust connections (B). Tighten clamps as needed and replace defective parts.



15. INSPECT ENGINE MOUNTS

Visually inspect engine mounts (C) for loose hardware or damaged parts.

Tighten all loose hardware and replace defective parts.

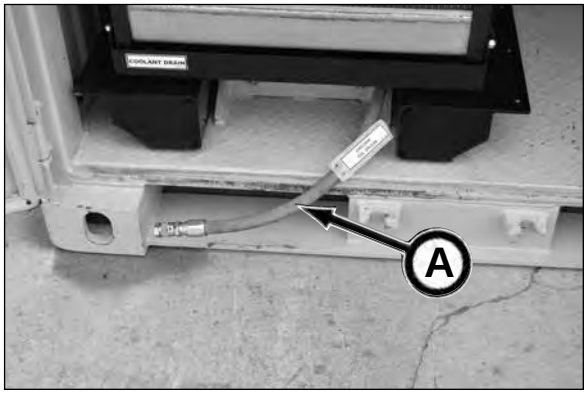
16. INSPECT & CLEAN FUEL TANK CAP

Inspect cap for damage. If cap is damaged, replace with new.

Remove cap and clean any debris or dirt from cap body.

Replace cap.

EVERY 500 HOURS OF OPERATION



17. CHANGE ENGINE OIL & FILTER

NOTICE Refer to your engine operation manual for more information.

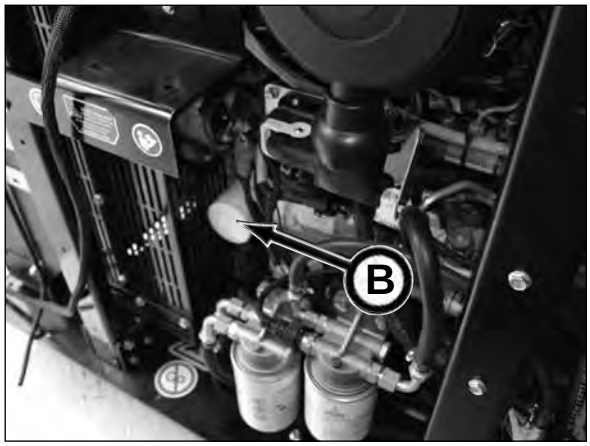
1. Gain access to the engine oil drain hose (A).

2. Remove cap from hose.

3. Drain oil into a catch pan of proper size.

4. Reinstall cap to hose.

5. Replace drain hose to storage position.



6. Clean and dry area around the oil filter (B).

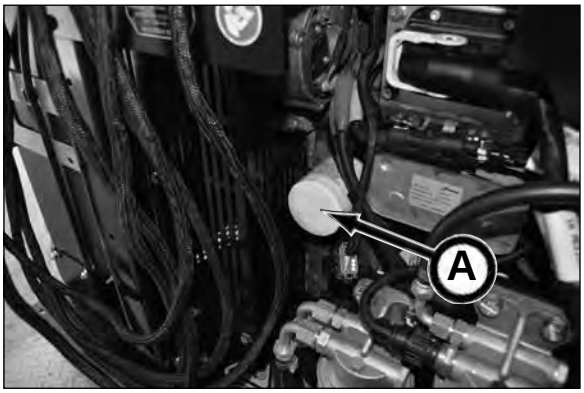
7. Remove oil filter and clean filter mounting pad. Dispose of filter properly.

(Continued on next page)

8. Lubricate gasket on new filter with clean oil.

   IMPORTANT: The new oil filter should never be prefilled. There is a danger of contamination.

9. Install new filter (A) and hand tighten according to values printed on the filter. Do not overtighten the filter element.

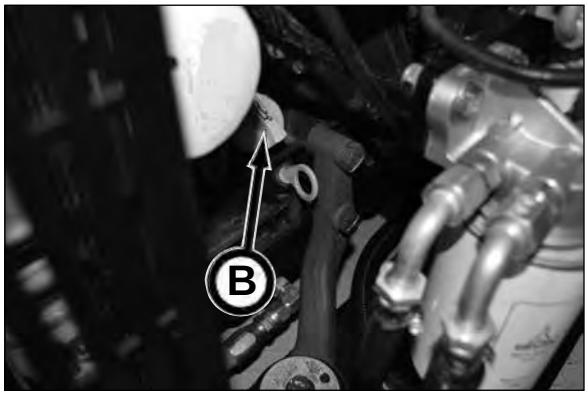


10. Remove fill cap (B).

11. Fill engine with engine oil specified in section 8, Fuels & Lubricants section. The following fluid capacity is an approximate value. Be sure to check level after filling. DO NOT OVERFILL.

    Oil Capacity: 8.45 qt (15 L)

12. Install fill cap. Screw cap handle clockwise to tighten. Clean up spills.



13. Start engine and run until warm and check for leaks.

14. Shutdown engine. Wait approximately 5 minutes to let the oil drain from the upper portion of the engine. Check oil level. Oil level must always be between the MIN and MAX marks on the dipstick. DO NOT OVERFILL!

18. DRAIN & FILL HYDRAULIC RESERVOIR

1. Retract thrust cylinders on GBM frame.

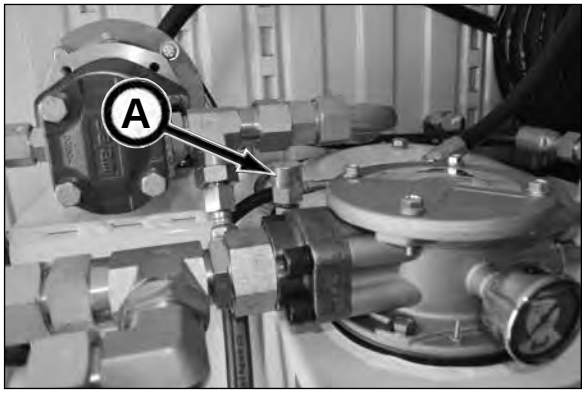
2. Shut down engine.

3. With power pack on level ground, allow oil in hydraulic reservoir to settle overnight.

IMPORTANT: BEFORE filling hydraulic reservoir, the breather/fitting must be removed to allow for proper venting. Failure to do so will result in pump damage. Be sure to replace breather/fitting after filling reservoir.

Removing breather/fitting before draining reservoir will drain the oil faster.

4. Remove breather/fitting (A) from reservoir BEFORE filling reservoir to allow for proper venting during filling process.

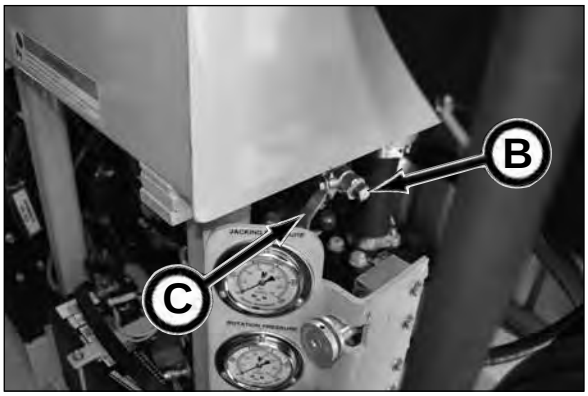


5. Remove plug (B) and install a 1/2” NPT hose to tank valve fitting.

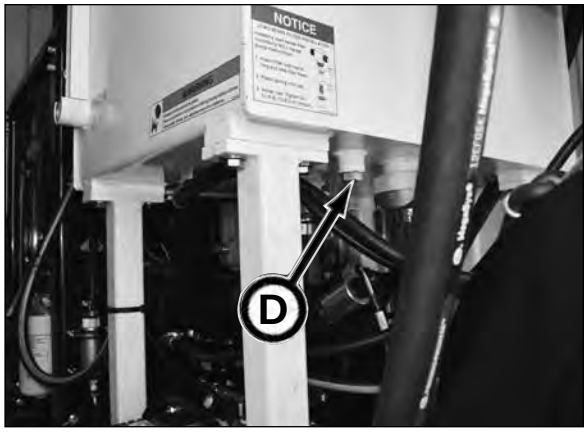
6. Route hose into an appropriate sized catch pan.

7. Slightly open tank drain ball valve (C) and drain until the reservoir has been drained.

8. Close tank drain ball valve, remove hose (if used) and reinstall plug.



NOTICE Not all units are equipped with a tank drain ball valve. These units include a 1/2” plug (D). Use a funnel to direct the drained oil to a catch pan. Once oil has been drained from reservoir, reinstall plug.



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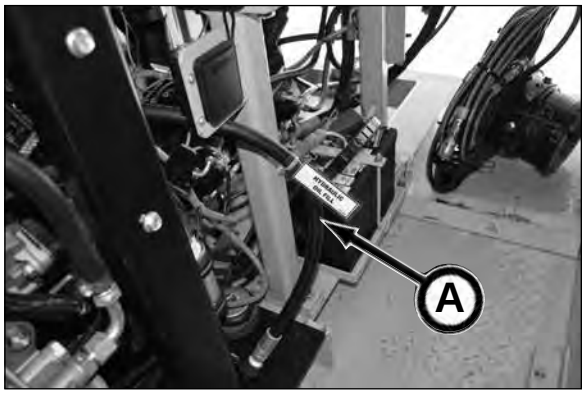
9. Remove hydraulic fill hose (A) from storage location. Remove cap from hose.



10. Place hose into clean hydraulic oil container.

NOTICE Refer to Fuels & Lubricants section for recommended hydraulic oil.

11. Flip Oil Fill Pump switch to the ON position to pump hydraulic oil into the hydraulic reservoir.

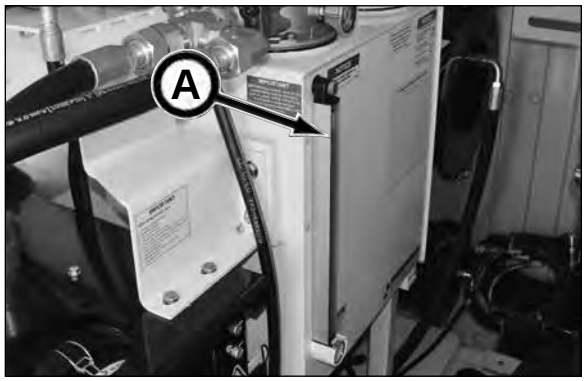
SN FA40040F-03 & Before

SN FA40040F-04 & After

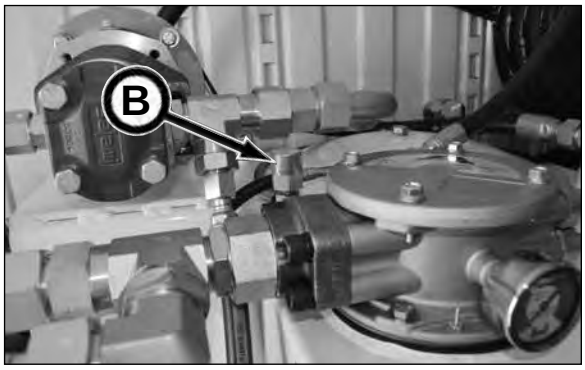
(continued on next page)

12. Fill until oil reaches the high mark on gauge (A).

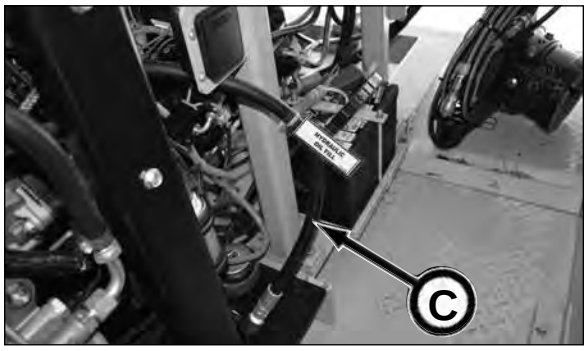
13. Flip Oil Fill Pump switch to the OFF position.



14. Replace breather/fitting (B) on reservoir.



15. Replace cap on fill hose (C) and place hose in storage location.



19. REPLACE AIR CLEANER FILTERS

NOTICE Refer to your engine operation manual for more information.

Replace air cleaner elements at 500 hours or 12 months, whichever occurs first.

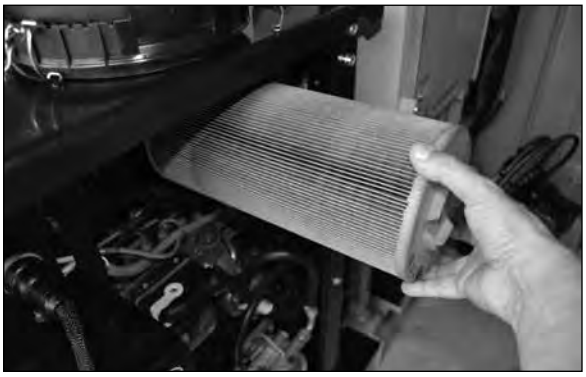
1. Clean area around the air cleaner assembly.

2. Unlatch and remove cover.

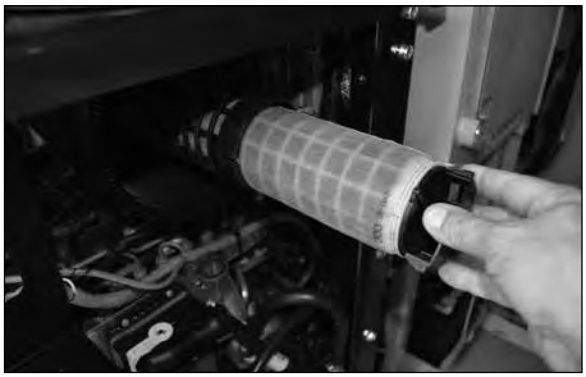
3. Gently remove primary element. Bumping the element against air cleaner housing may contaminate the clean side of the filter housing with dirt and dust.

4. Properly dispose of primary element.

5. Thoroughly clean out the inside of filter housing with a clean, damp cloth. Dirt left in the filter housing will shorten the life of the filter elements.



6. Gently remove secondary (safety) element. Immediately install a new secondary element to prevent any dirt or dust from entering the air intake system.



NOTICE NEVER run the engine without the secondary element in place. Doing so will cause engine damage.

Replacement of the secondary element is usually necessary only when the primary element has a hole in it.

(Continued on next page)

7. Carefully install a new primary filter element by applying pressure by hand at outer rim of filter.

NOTICE Do not use latches on cover to force filter into air cleaner. Using cover to force filter into housing will damage cleaner housing.

8. Replace cover with dust unloader valve facing down (6 o'clock position). Secure the latches.

20. REPLACE FUEL FILTER

NOTICE Refer to your engine operation manual for more information.

1. Clean area around fuel filter assembly (A).

2. Loosen and remove fuel filter and catch any escaping fuel.

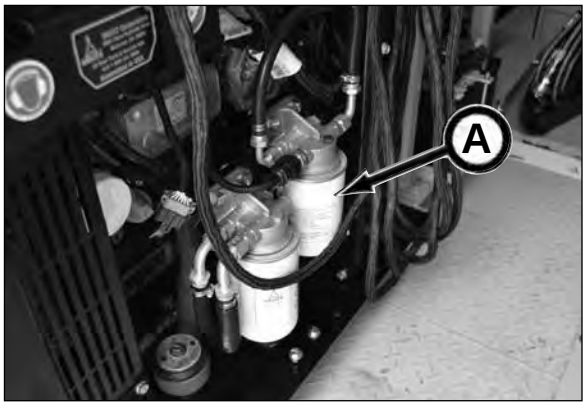
3. Clean the sealing surface of the fuel filter head assembly with a lint-free, clean cloth.

4. Inspect mounting base for damage. Repair or replace as needed.

5. Lubricate gasket on new filter with clean oil.

6. Install new filter and hand tighten according to values printed on the filter. Do not overtighten the filter element.

7. The fuel system must now be vented. Refer to 21. Venting Fuel System below. **Do not start the power pack engine until the fuel system has been properly vented.**



21. VENT FUEL SYSTEM

NOTICE Refer to your engine operation manual for more information.

Whenever the fuel system has been opened up for service (lines disconnected or filter replaced), it will be necessary to vent the fuel system.

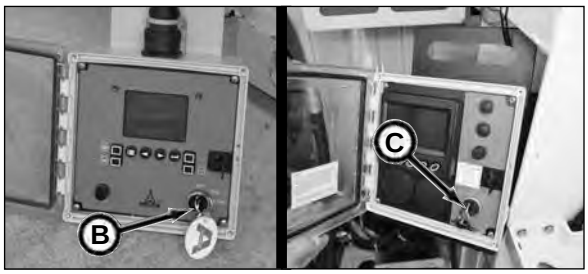
The fuel system is vented via the electric fuel supply pump. To ensure that no error messages are generated, do not start the engine while performing the venting procedure.

1. (SN FA40040F04 & Before) Turn the key switch (B) clockwise to the RUN position. The electronic fuel supply pump switches on for 20 seconds in order to vent the fuel system and buildup the required fuel pressure.

1. (SN FA40040F-05 & After) Turn key switch (C) CCW to MAN (Manual) position. The electronic fuel supply pump switches on for 20 seconds in order to vent the fuel system and buildup the required fuel pressure.

2. Once the fuel pump has stopped, turn the key switch to the OFF position.

3. Repeat steps 1 and 2 at least two more times until the fuel system is properly vented.



SN FA40040F-04 & Before

SN FA40040F-05 & After

22. CHECK COOLING SYSTEM

NOTICE Refer to your engine operation manual for more information.

⚠WARNING Cooling system under pressure. Explosive release of HOT engine coolant can cause severe burns. SLOWLY remove the radiator cap ONLY if the engine is cool.

1. Visually check the cooling system for leaks. Tighten all clamps securely.

2. Check to be sure the coolant level is at the bottom of the filler neck (A). Add coolant mixture if needed. Refer to Engine Coolant in section 8, Fuels & Lubricants of this manual.

3. Inspect all cooling system hoses. If the hoses are found to be in a hard, weak, or cracked condition, replace the hose(s).

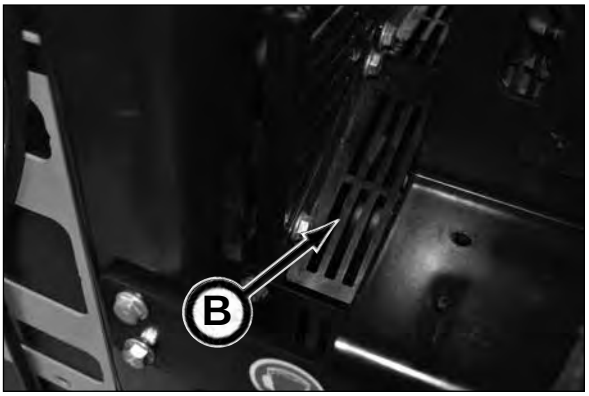
4. Check the radiator for bent fins. Carefully straighten fins.

5. Check the inlet and outlet tubes for cracks, kinks, dents, or fractured seams. Repairs must be made by a qualified radiator technician.

6. Check the effectiveness of the coolant solution with a hydrometer or other measuring device. Refer to your engine manual for service information.

7. Pressure test the cooling system. Refer to your engine manual for service information.

23. CHECK BELT & BELT TENSIONER

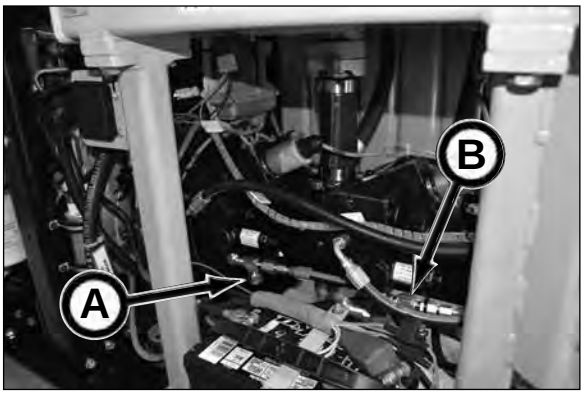


NOTICE Refer to your engine operation manual for more information.

1. Inspect the drive belt (B) for excessive wear or damage. If damaged, replace with new. Refer to your engine manual for service instructions.

2. Check the drive belt tensioner for proper operation. Refer to your engine manual for service instructions.

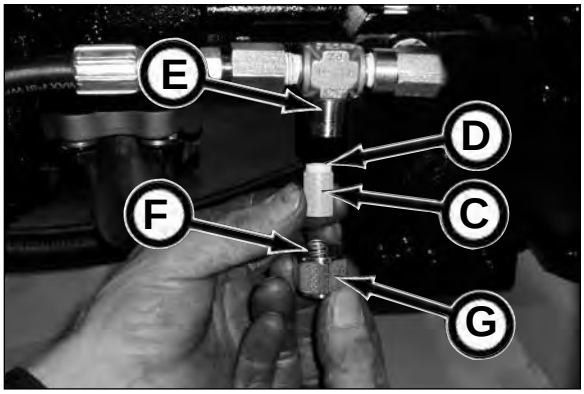
24. REPLACE LOAD SENSE FILTERS



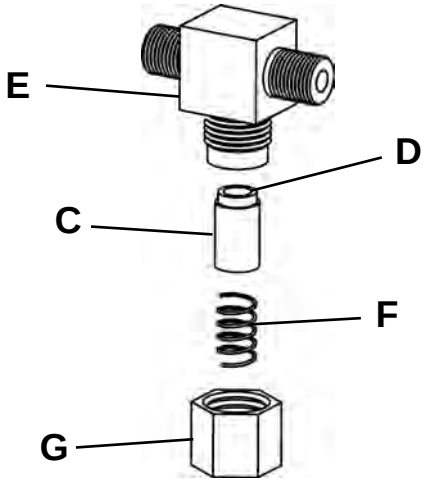
The load sense filters (2 places) for the jacking (A) and rotation (B) pumps must be replaced at:

- 500 hours or yearly, which ever occurs first
- a major component fails
- any signs of water contamination
- hydraulic fluid sample indicates large particle contamination
- controls are sluggish

NOTICE Installing a load sense filter incorrectly, WILL cause pump malfunction.



1. Remove cap, spring, and filter from filter head.
2. Insert new filter (C) with nylon ring end (D) into filter head (E).
3. Place spring (F) into cap (G).
4. Install cap onto filter head. Tighten to 10 ft-lb (13.6 N·m) torque.

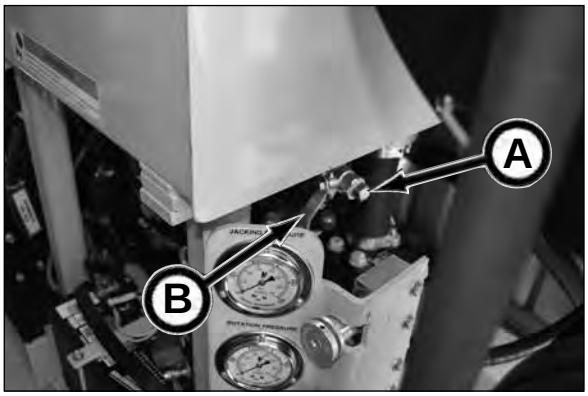


Load Sense Filter Installation

COMPLETION OF EACH DRIVE

25. DRAIN WATER FROM HYDRAULIC RESERVOIR

Remove water contamination from the hydraulic reservoir by draining water from the reservoir at the completion of each drive.



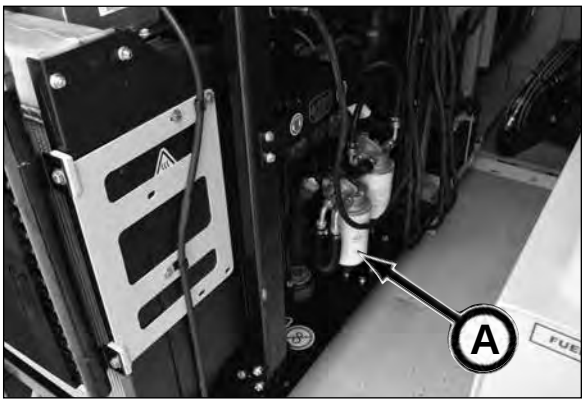
1. With power pack on level ground, allow oil in hydraulic reservoir to settle overnight.
2. Remove plug (A) and install a 1/2” NPT hose to tank valve fitting.
3. Route hose into a catch pan.
4. Slightly open tank drain ball valve (B) and drain until there is no water in oil.
5. Once water is removed from reservoir, close tank drain ball valve, remove hose (if used) and reinstall plug.

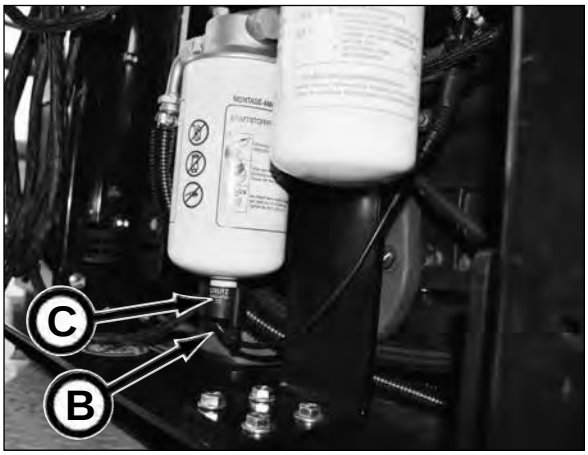
NOTICE Not all units are equipped with a tank drain ball valve. These units include a 1/2” plug (C). Use a funnel to direct the drained water to a catch pan. Once water has been removed from from reservoir, reinstall plug.

EVERY 1000 HOURS OF OPERATION

26. REPLACE FUEL/WATER SEPARATOR

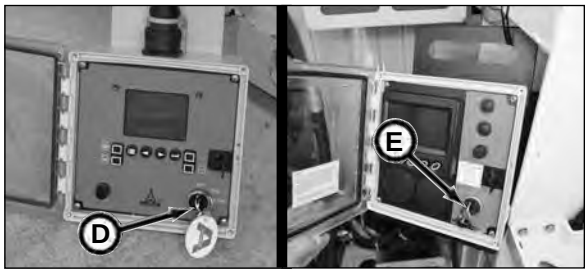
NOTICE Refer to your engine manual for more information.





1. Shutdown engine.
2. Shut off the fuel supply to the engine.
2. Place an appropriate sized catch pan under the fuel pre-filter assembly (A).
3. Disconnect electrical cable connection (B).
4. Loosen drain plug (C).
5. Disassemble filter insert.
6. Clean any dirt off the sealing surfaces of the new filter cartridge and opposite side of filter head.
7. Lightly wet the sealing surfaces of the filter cartridge with fuel and install back onto the filter head. Hand tighten according to values printed on the filter.
8. Reinstall and tighten drain plug.
9. Reconnect electrical cable connection.
10. Open fuel supply to the engine.
11. Vent the fuel system as follows:
12. (SN FA40040F04 & Before) Turn the key switch (D) clockwise to the RUN position. The electronic fuel supply pump switches on for 20 seconds in order to vent the fuel system and buildup the required fuel pressure.

12. (SN FA40040F-05 & After) Turn key switch (E) CCW to MAN (Manual) position. The electronic fuel supply pump switches on for 20 seconds in order to vent the fuel system and buildup the required fuel pressure.



SN FA40040F-04 & Before *SN FA40040F-05 & After*

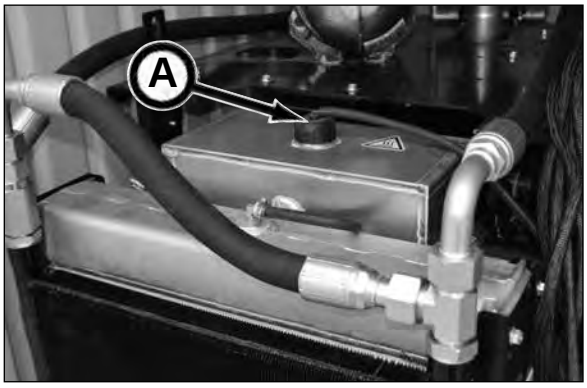
13. Once the fuel pump has stopped, turn the key switch to the OFF position.
14. Repeat steps 12 and 13 at least two more times until the fuel system is properly vented.

EVERY 2000 HOURS OF OPERATION

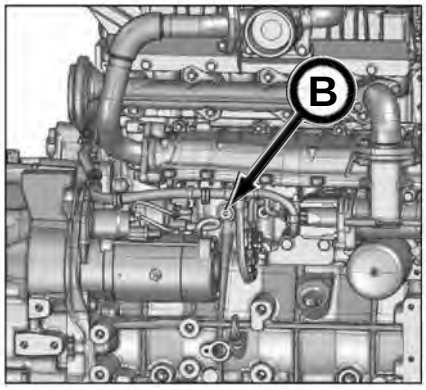
27. FLUSH & FILL COOLING SYSTEM

IMPORTANT: Refer to your engine operation manual for more information when flushing and refilling the cooling system.

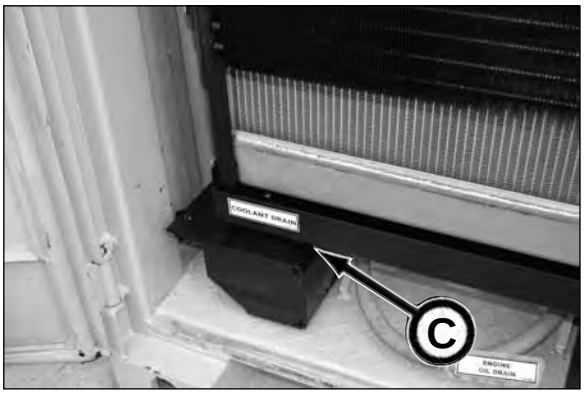
⚠WARNING Cooling system under pressure. Explosive release of HOT engine coolant can cause severe burns. SLOWLY remove the radiator cap ONLY if the engine is cool.



1. With the engine cold, wearing gloves and eye protection, slowly remove the radiator cap (A) on the overflow reservoir.



2. Open engine coolant locking screw (B) on back side of engine. Drain all coolant from engine block into catch pan. Dispose of coolant properly.



3. Open radiator drain valve (C). Drain all coolant from radiator into catch pan. Dispose of coolant properly.

4. Replace thermostats, if necessary (contact your engine dealer for service information).

5. After coolant has drained, close engine coolant locking screw and radiator drain valve.

NOTICE Never add water or coolant to a hot engine. Doing so will result in engine damage.

6. Refill the cooling system with soft, clean water.

(continued on next page)

⚠CAUTION Do not run engine longer than 10 minutes. Doing so may cause burns when radiator is draining from an overheated engine.

7. Start the engine and run it for about 10 minutes to thoroughly circulate the water and to stir up possible rust or sediment.

8. Stop engine and immediately drain the water from the system before rust and sediment settle.

NOTICE It may be necessary to remove the lower radiator hose to fully drain the system. Be sure to replace radiator hose and tighten clamp after draining.

9. After draining water, close the engine coolant locking screw and radiator drain valve.

10. Reinstall radiator cap, and if removed, reinstall the lower radiator hose and clamp.

11. Continue flushing system until scale deposits, rust, sediment and cooling cleaner (if used) are completely removed.

NOTICE Cooling system cleaners may need to be used to remove scale formation. See your engine manual for more information.

12. Close engine locking screw and radiator plug.

13. (If removed) Reinstall radiator hose and tighten clamp securely.

14. Install thermostats using a new gasket (see your engine manual for more information).

NOTICE DO NOT overfill cooling system. A pressurized system needs space for heat expansion without overflowing at top of radiator.

15. Fill coolant into radiator with a 50% mixture of ethylene glycol engine coolant and distilled, deionized, or demineralized water, and a supplemental coolant additive until the coolant level reaches the bottom of the radiator overflow reservoir filler neck.

NOTICE Refer to your engine manual for information on using a Supplemental Coolant Additive (SCA) in your coolant system.

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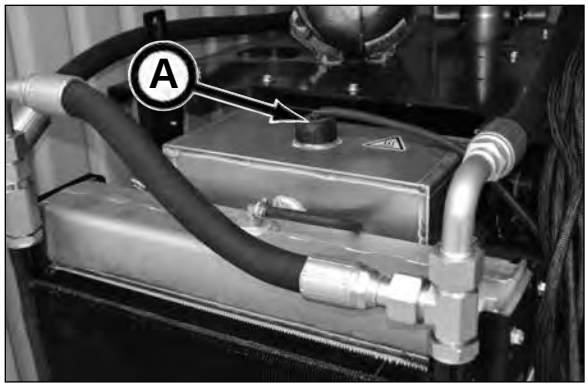


16. Replace radiator cap (A).

17. Start engine and operate it for 5 minutes to circulate the water/coolant/SCA (if used) mixture.

18. Shut off engine.

19. SLOWLY remove radiator cap.

20. Check radiator coolant level and fill as needed for coolant to reach the bottom of the filler neck.

21. Replace radiator cap.

22. Start engine and run it until it reaches operating temperature. This will mix the coolant uniformly and circulate it throughout the system.

23. Shut off engine. Check coolant level and add if necessary. Check entire coolant system for leaks.

Storage

PREPARING FOR STORAGE

1. Repair worn or damaged parts.
2. Wash equipment thoroughly.
3. Drain engine oil, replace filter(s) and refill engine with oil specified in Fuels & Lubricants section.
4. Drain water and sediment from fuel system. Dispose of water and sediment properly.
5. Fill fuel tank completely. Refer to engine manual for adding fuel stabilizer into tank.
6. Store diesel fuel in plastic, aluminum, or steel containers specially coated for diesel fuel storage.
7. Loosen all belts.
8. Clean air cleaner.
9. Restart engine and operate machine long enough to warm the oil. Check for leaks after machine warms up.
10. Remove battery (negative cable first) and store it in a cool, dry place. Remove corrosion from cables and battery case. Use baking soda to neutralize acid. Place battery on wood (not concrete) and connect a small trickle charger to it to maintain charge; OR charge battery every 30 days it is in storage, if necessary.
11. Repaint equipment where necessary.
12. Drain hydraulic oil, flush oil reservoir, change hydraulic filters, and refill hydraulic reservoir. Check for leaks.
13. Change hydraulic filters and refill hydraulic reservoir. Check for leaks.
14. Wipe up lube spills. Dispose of rags and trash properly.
15. If possible, store equipment under cover and out of the weather in a ventilated area.
16. If the engine will be stored over 6 months, refer to your engine manual for preparing the engine for long term storage.

REMOVING FROM STORAGE

1. Clean equipment thoroughly.
2. Check to make sure all decals including safety decals are clean and readable.
3. Check condition of wires and cables. Repair or replace as necessary.
4. Charge battery (if necessary) and install it.
5. Check coolant level. If coolant level is low, check for leaks and add coolant as required.
6. Adjust belt tension.
7. Check for leaks. Repair or replace as necessary.
8. Check hydraulic oil level. If fluid is low, check for leaks and add oil as required. See Power Pack Oil Reservoir Lubricant in section 8, Fuels & Lubricants.
9. Check condition of all hoses and connections. Tighten, repair or replace with new as needed.
10. Before operating, cycle hydraulic functions several times to purge air from the hydraulic system.
11. See your engine manual on how to restore engine to service.
12. If diesel fuel is stored for more than a month prior to use, or there is a slow turnover in fuel tank or supply tank, consult your Deutz engine manual for adding a fuel conditioner or equivalent to stabilize the fuel and prevent water condensation.
13. Review this Operation Manual and your GBM Operator’s Manual.

Troubleshooting

NOTICE Refer to your engine manual, Fault Tables for more detailed troubleshooting information.

Problem	Cause	Solution
Engine cranks but will not start.	No fuel.	Check fuel in tank. Open fuel shut-off valve.
	Fuel filter plugged or full of water.	Replace fuel filter and/or drain water from filter.
	Injection pump not getting fuel or air in fuel system.	Bleed fuel system.
	Wire harness or wires disconnected on injector pump.	Repair loose connections or replug harness.
Engine hard to start or will not start.	No fuel.	Check fuel in tank. Open fuel shut-off valve.
	Air in fuel line.	Bleed fuel system.
	Cold weather.	Use cold weather starting procedure.
	Crankcase oil too heavy.	Use proper oil viscosity.
	Clogged fuel filter.	Replace filter element.
	Water, dirt, or air in fuel system.	Drain, flush, fill, and vent fuel system.
Engine shuts down during operation.	Defective high water temperature sensor.	Replace water temp. sensor.
	Defective low oil pressure switch.	Replace low pressure switch.
Engine knocks.	Low engine oil level.	Add oil to engine crankcase.
	Low coolant temperature.	Remove and check thermostat.
Engine runs irregularly or stalls frequently.	Low coolant temperature.	Remove and check thermostat.
	Clogged fuel filter.	Replace filter element.
	Water, dirt, or air in fuel system.	Drain, flush, fill, and vent fuel system.
Below normal engine temperature.	Defective thermostat.	Remove and check thermostat.
	Defective temperature gauge or sender.	Check gauge, sender, and connections.
Lack of power.	Engine overloaded.	Reduce load on engine.
	Intake air restriction.	Service air cleaner.
	Clogged fuel filter.	Replace fuel filter.
	Improper type of fuel.	Use proper fuel.
	Below normal engine temperature.	Remove and check thermostat.
	Restricted fuel hose.	Clean or replace fuel hose.

(Continued on next page)

Power Pack Engine (Continued)

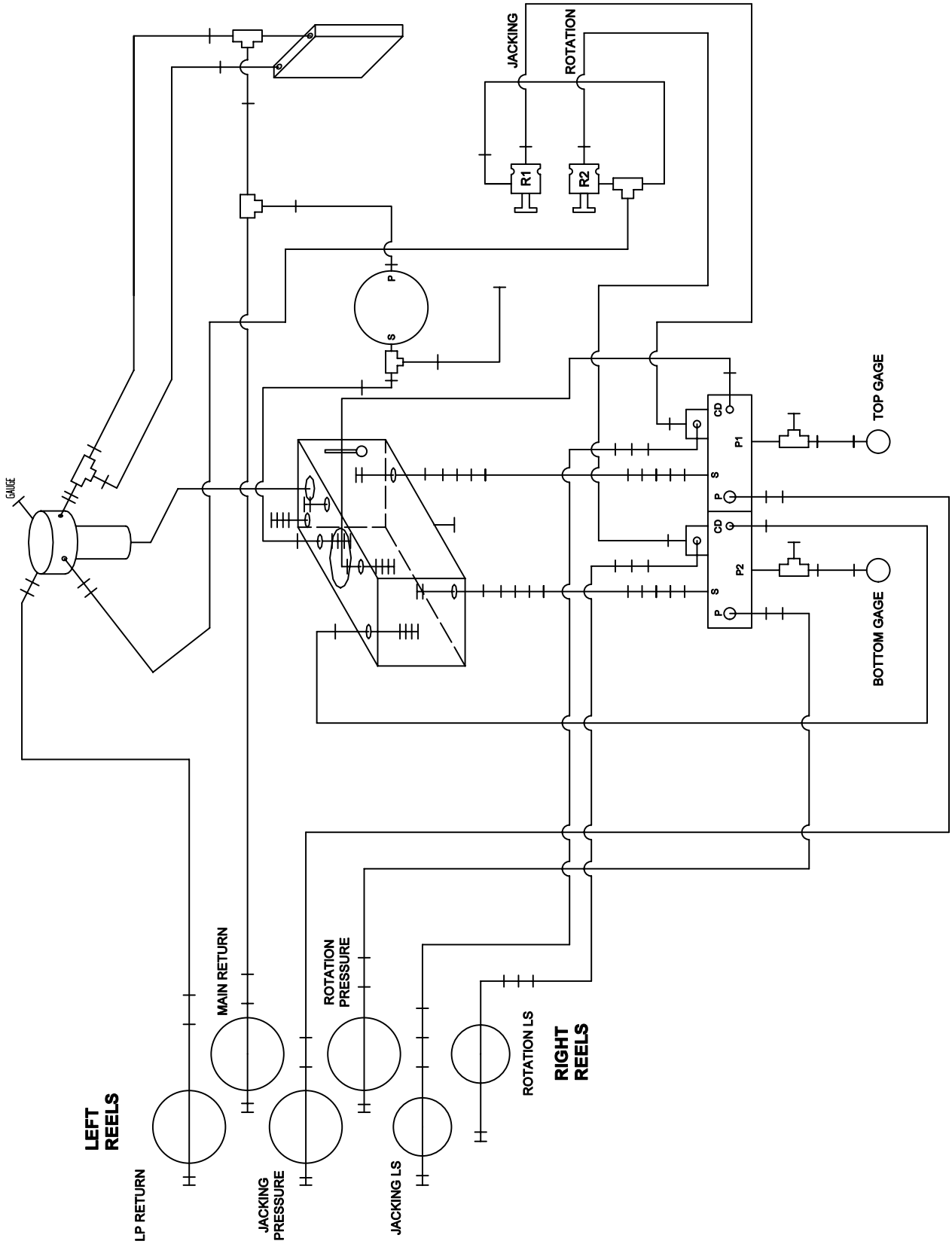
Problem	Cause	Solution
Low oil pressure.	Low oil level.	Add oil.
	Improper oil type.	Drain, fill crankcase with proper oil and quantity.
High oil consumption.	Crankcase oil too light.	Use proper oil.
	Oil leaks. gaskets, and drain plug.	Check for leaks in lines,
	Restricted crankcase vent tube.	Clean vent tube.
Engine emits white smoke.	Improper type of fuel.	Use proper fuel.
	Low engine temperature.	Warm up engine to normal operating temperature.
	Defective thermostat.	Remove and check thermostat.
Engine emits black or gray exhaust smoke.	Improper type of fuel.	Use proper fuel.
	Clogged or dirty air cleaner.	Service air cleaner.
	Engine overloaded.	Reduce load on engine.
Engine overheats.	Doors closed on power pack.	Open all power pack doors.
	Engine overloaded.	Reduce load on engine.
	Low coolant level.	Fill radiator to proper level and check for leaks.
	Faulty radiator cap.	Have a technician check.
	Drive belt loose or defective.	Replace belt.
	Defective belt tensioner.	Replace tensioner.
	Low engine oil level.	Add oil as needed.
	Plugged radiator.	Clean.
	Cooling system requires flushing.	Flush cooling system.
	Defective thermostat.	Remove and check thermostat.
	Incorrect grade of fuel.	Use correct grade of fuel.
High fuel consumption.	Incorrect grade of fuel.	Use correct grade of fuel.
	Clogged or dirty air cleaner.	Service air cleaner.
	Engine overloaded.	Reduce load on engine.

(Continued on next page)

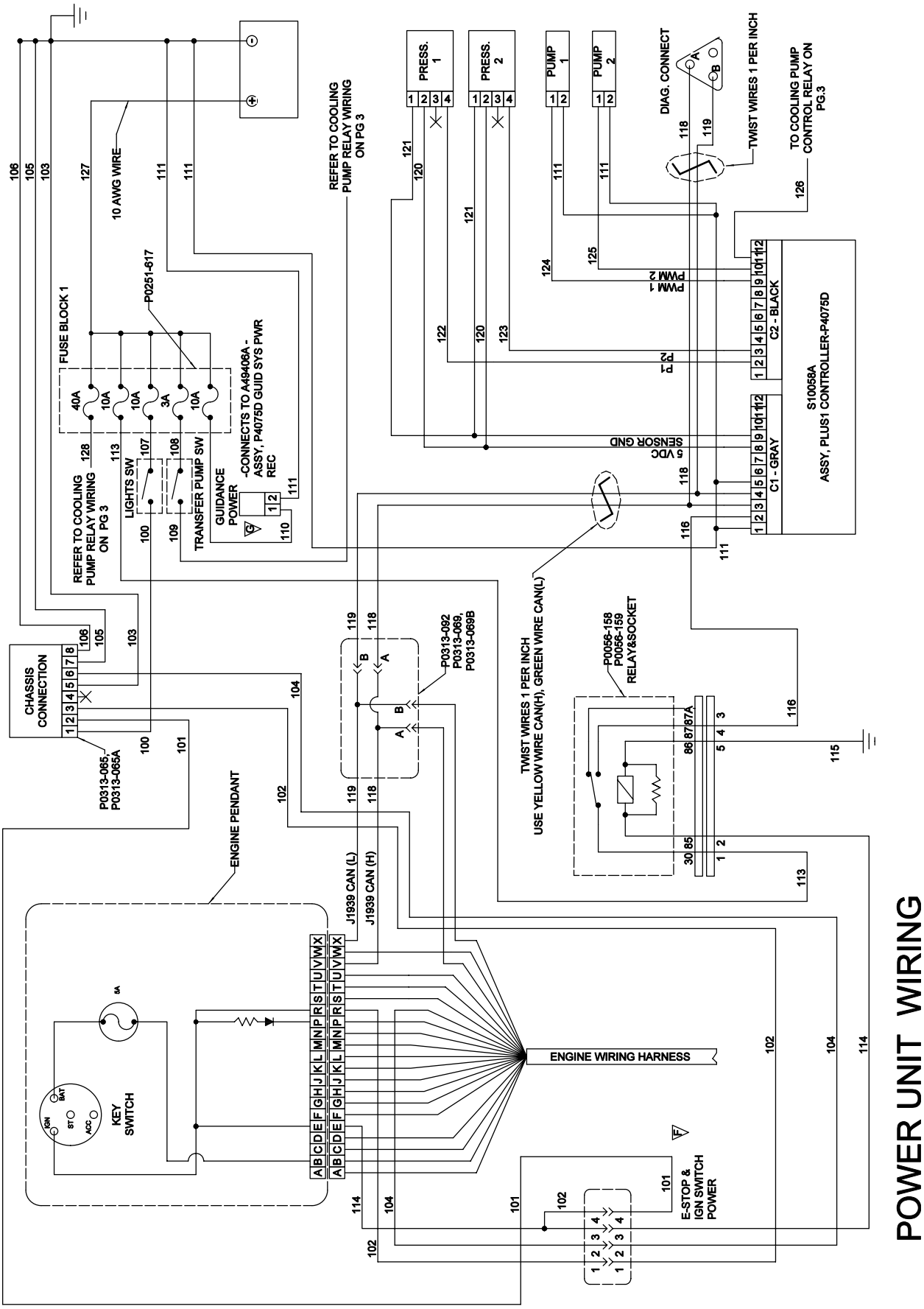
Power Pack Engine (Continued)

Problem	Cause	Solution
Undercharged system.	Excessive engine idling.	Increase engine rpm when heavy electrical load is used.
	Poor electrical connectors on battery, ground strap, starter, or alternator.	Inspect and clean or replace as necessary.
	Defective battery.	Test battery.
	Defective alternator. Replace alternator.	Test charging system.
Battery uses too much water.	Cracked battery case.	Replace battery.
	Defective battery.	Test battery. Replace if needed.
Battery will not charge.	Loose or corroded connections.	Clean and tighten connections.
	Worn out battery.	Replace battery.
	Drive belt loose or defective.	Replace belt.
	Defective belt tensioner.	Replace tensioner.
Starter will not crank.	Loose or corroded connections.	Clean and tighten connections.
Starter cranks slowly.	Crankcase oil too heavy.	Use proper oil.
	Loose or corroded connections.	Clean and tighten connections.
Entire electrical system does not function.	Loose or faulty battery connection.	Clean and tighten connections.
	Worn out battery.	Replace battery.

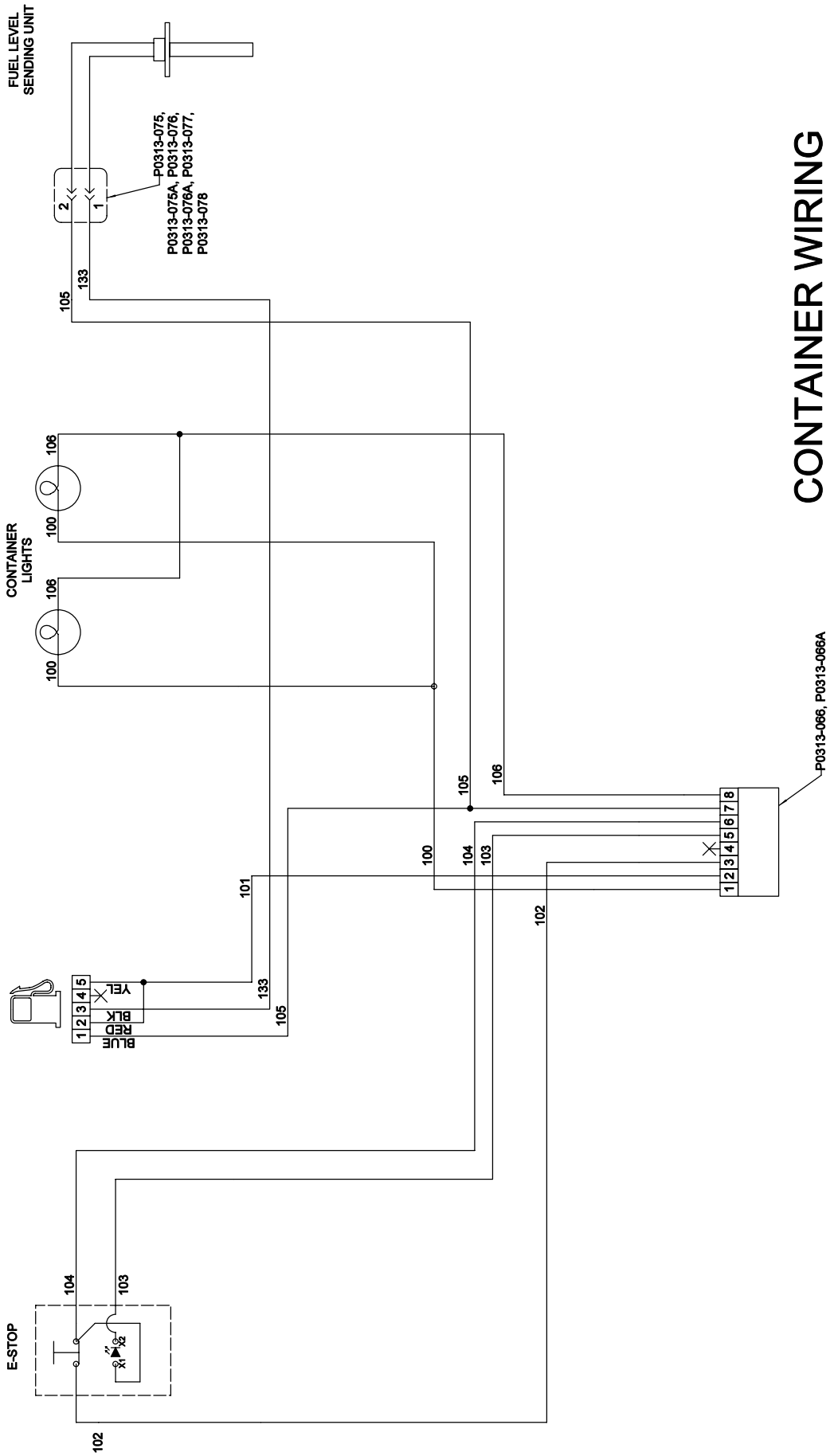
HYDRAULIC DIAGRAM

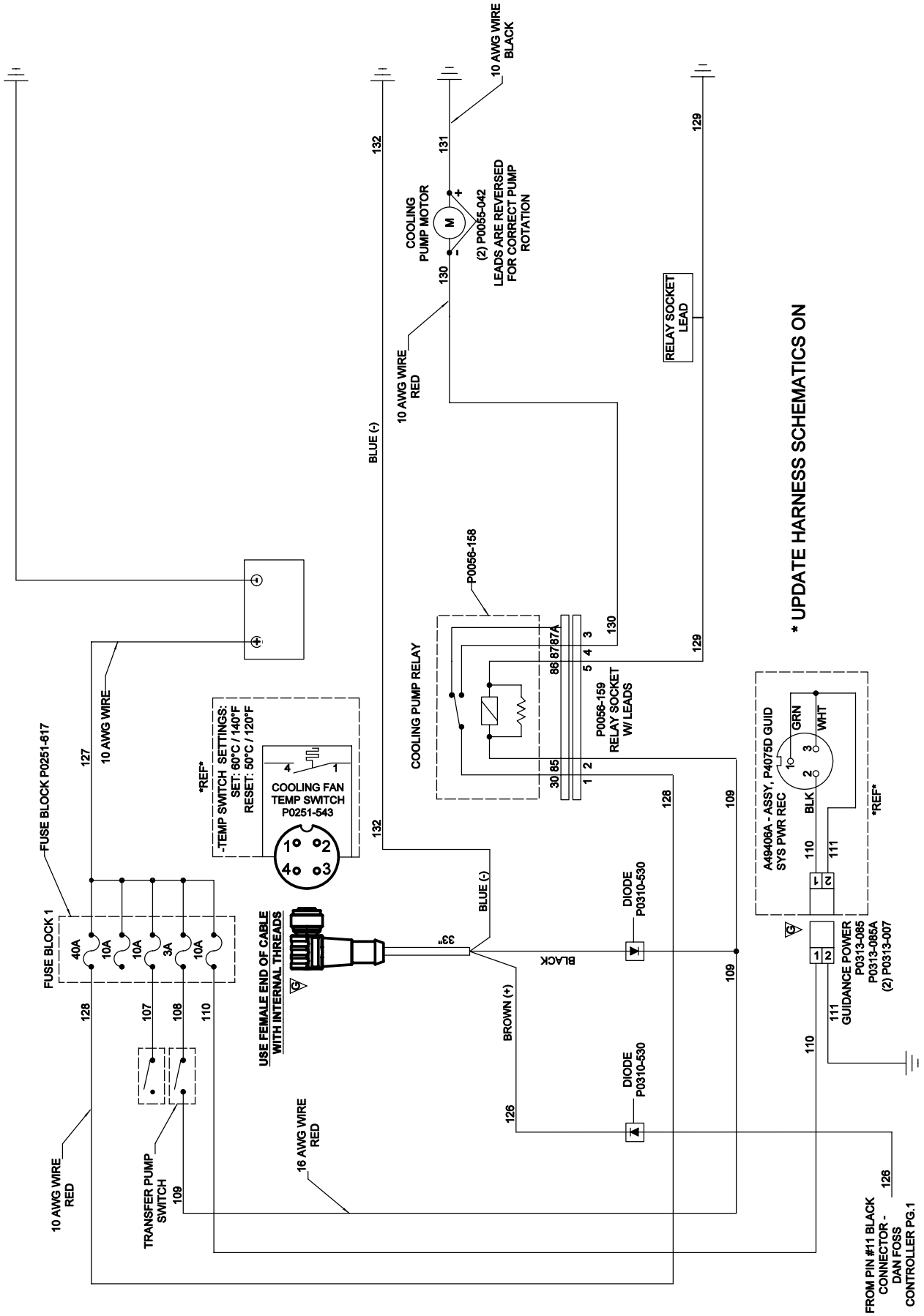


ELECTRICAL SCHEMATIC - POWER UNIT WIRING



ELECTRICAL SCHEMATIC - CONTAINER WIRING



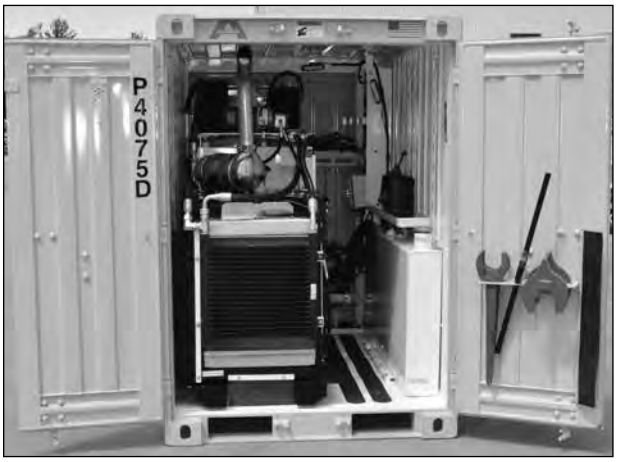

10 AWG WIRE BLACK
COOLING PUMP MOTOR
(2) P0055-042 LEADS ARE REVERSED FOR CORRECT PUMP ROTATION
10 AWG WIRE RED
RELAY SOCKET LEAD
BLUE (-)
P0056-158
COOLING PUMP RELAY
P0056-159 RELAY SOCKET W/ LEADS
* UPDATE HARNESS SCHEMATICS ON
FUSE BLOCK P0251-617
FUSE BLOCK 1
40A
10A
10A
3A
10A
10 AWG WIRE
REF
-TEMP SWITCH SETTINGS: SET: 60°C / 140°F RESET: 50°C / 120°F
COOLING FAN TEMP SWITCH P0251-543
USE FEMALE END OF CABLE WITH INTERNAL THREADS
33"
BLUE (-)
BLACK
BROWN (+)
DIODE P0310-530
DIODE P0310-530
A49406A - ASSY, P4075D GUID SYS PWR REC
GRN
WHT
BLK
REF
GUIDANCE POWER P0313-085 P0313-085A (2) P0313-007
16 AWG WIRE RED
10 AWG WIRE RED
TRANSFER PUMP SWITCH
FROM PIN #11 BLACK CONNECTOR - DAN FOSS CONTROLLER PG.1

WIRE NUMBER AND CIRCUIT DESCRIPTIONS

Wire Number	Description	From Location # 1	To Location # 2	Wire Color / Gauge
100	POWER TO LIGHTS	TOGGLE SWITCH	LIGHTS	BLUE-BLACK / 16 AWG
101	E-STOP 4 PIN TO FUEL GAUGE	4 PIN E-STOP	FUEL GAUGE	BLUE / 16 AWG
102	POWER TO E-STOP	POWER	E-STOP	BLUE / 16 AWG
103	GROUND TO E-STOP	GROUND	E-STOP	WHITE / 16 AWG
104	E-STOP 4 PIN TO E-STOP BUTTON	E-STOP	ECU POWER	BLUE / 16 AWG
105	FUEL GAUGE GROUND TO SENDER	FUEL GAUGE GROUND	SENDER	BLUE / 16 AWG
106	GROUND TO LIGHTS	GROUND	LIGHTS	WHITE-BLUE / 16 AWG
107	POWER FUSE BOX TO LIGHT SWITCH	FUSE BLOCK 1	LIGHT SWITCH	RED / 16 AWG
108	POWER FUSE BOX TO COOL PUMP RELAY SWITCH	FUSE BLOCK 1	COOLING PUMP RELAY SWITCH	RED / 16 AWG
109	TRANSFER PUMP CONTROL	TRANSFER PUMP SWITCH	COOLING PUMP RELAY	RED / 16 AWG
110	POWER FUSE BOX TO GUIDING SYSTEM PLUG	FUSE BLOCK 1	GUIDANCE PLUG	BLUE / 16 AWG
111	GROUND	BATTERY GROUND	MULTIPLE	WHITE-BLUE / 16 AWG
113	POWER FUSE POWER TO RELAY	FUSE BLOCK 1	LIGHTS	BLUE / 16 AWG
114	ECU POWER RELAY	KEY	RELAY	BLUE / 16 AWG
115	GROUND FOR RELAY	GROUND	RELAY	WHITE-BLUE / 16 AWG
116	RELAY TO DANFOSS GRAY PIN #2	RELAY	DANFOSS GRAY PIN # 2	GREEN / 16 AWG
118	CAN H	CONTROLLER	CAN H	YELLOW / 16 AWG
119	CAN L	CONTROLLER	CAN L	GREEN / 16 AWG
120	5 VDC PRESS # 1 & 2	CONTROLLER	PRESSEURE SENSOR 1 & 2	RED-WHITE / 16 AWG
121	SENSOR GROUND PRESS # 1 & 2	CONTROLLER	PRESSEURE CONTROLLER 1 & 2	WHITE-BLUE / 16 AWG
122	PUMP # 1 PRESSURE	CONTROLLER	PRESSEURE SENSOR 1	VIOLET / 16 AWG
123	PUMP # 2 PRESSURE	CONTROLLER	PRESSEURE SENSOR 2	GREEN / 16 AWG
124	PWM # 1	CONTROLLER	PUMP 1 SOLENOID	ORANGE / 16 AWG
125	PWM # 2	CONTROLLER	PUMP 2 SOLENOID	BLUE / 16 AWG
126	DANFOSS CONTROLLER TO COOLING FAN TEMP SWITCH	CONTROLLER	COOLING FAN TEMP SWITCH	BROWN / 16 AWG
127	FUSE BLOCK TO BATTERY POWER	FUSE BLOCK POWER	BATTERY POWER	BLUE / 10 AWG
128	FUSE BLOCK TO COOLING PUMP RELAY	FUSE BLOCK POWER	COOLING PUMP RELAY	BLUE / 10 AWG
129	TRANSFER PUMP SWITCH TO RELAY	GROUND	COOLING PUMP RELAY	WHITE-BLUE / 16 AWG
130	COOLING PUMP RELAY TO COOLING PUMP MOTOR	COOLING PUMP RELAY	COOLING PUMP MOTOR	BLUE / 10 AWG
131	GROUND COOLING PUMP	COOLING PUMP	GROUND	WHITE-BLUE / 10 AWG
132	GROUND COOLING FAN TEMP SWITCH	GROUND	FAN TEMP SWITCH	BLUE / 16 AWG
133	FUEL LEVEL SIGNAL	FUEL GAUGE	FUEL LEVEL SENDING UNIT	WHITE-BLUE / 16 AWG

Specifications

P4075D FEATURES & SPECIFICATIONS



FEATURES

- Assembly comes complete with the GBM P4075D Power Pack, remote control pendant, 50 foot hydraulic hose set to connect hoses from the power pack to the GBM 240A/308A/339A jacking frame, & standard tooling for pilot tube installation.
- Standard tooling includes: pilot tube breakout tool, pilot tube scraper, pilot tube to reaming head adapter, steering head kit, pilot tube support bars, guidance system, wrench set, and launch shaft breakout tool.
- Access doors on both ends for engine ventilation and a walk-through tooling storage area.
- Powered by a four cylinder, liquid cooled, charged air cooling with electronic governor, 74 HP tier IV diesel engine.
- Two load sense, variable volume piston pumps provide smooth efficient operation.
- Remote control pendant with 50 feet of cable, controls the engine functions in shaft.
- Hydraulic hoses are stored on hose reels for ease of hose routing to jacking frame.
- Quick coupler connections with lock for easy and secure hydraulic hoses at jacking frame.
- Hydraulic pressure gauges for monitoring jacking and rotation system pressures.
- Equipped with E-Stop control for quick access at container.
- Equipped with in-tank hydraulic return filter.

SPECIFICATIONS

Dimensions
- Height .....82 in. (2,083 mm)
- Width .....58 in. (1,473 mm)
- Length .....96 in. (2,438 mm)

Weight ..... 8,000 lbs. (3,629 kg)

Fluid Capacities
- Fuel Tank ..... 50 gal (189 L)
- Hydraulic Reservoir ..... 50 gal (189 L)

Power Unit
- Four Cylinder Diesel Engine ... 74 HP (55 kW)

Pumps
- Variable Piston
  - Jacking ..... 0 to 34 gpm (0 to 129 L/min)
  - Rotation ..... 0 to 34 gpm (0 to 129 L/min)
  - Operating Pressure** .....5,000 psi (34,475 kPa)

** Maximum

Breakout Tool
- Breaking Torque ... 12,000 ft-lbs (16,272 N·m)
- Power Source ..... 110 VAC

Pilot Tube/Reaming Head Adapter
- .....4.15” OD x 3” ID Hex Core x 5” OD

TORQUE CHART

Use these torque values as a guideline when tightening hardware unless otherwise specified in this manual.

Lubricated Coarse UNC Threads Grade 8 Fasteners			**Lubricated Fine UNF Threads Grade 8 Fasteners**		
Bolt Size	**Torque ft. lbs.**	**(N·m)**	**Bolt Size**	**Torque ft. lbs.**	**(N·m)**
1/4 - 20	10	(14)	1/4 - 28	11	(15)
5/16 - 18	20	(27)	5/16 - 24	22	(30)
3/8 - 16	35	(47)	3/8 - 24	39	(53)
7/16 - 14	56	(76)	7/16 - 20	62	(84)
1/2 - 13	85	(115)	1/2 - 20	96	(130)
9/16 - 12	123	(167)	9/16 - 18	137	(186)
5/8 - 11	170	(231)	5/8 - 18	192	(260)
3/4 - 10	301	(408)	3/4 - 16	336	(456)
7/8 - 9	450	(610)	7/8 - 14	500	(678)
1 - 8	680	(922)	1 - 12	740	(1003)
1-1/8 - 7	960	(1302)	1-1/8 - 12	1030	(1397)
1-1/4 - 7	1360	(1844)	1-1/4 - 12	1500	(2034)
1-1/2 - 6	2360	(3200)	1-1/2 - 12	2660	(3607)

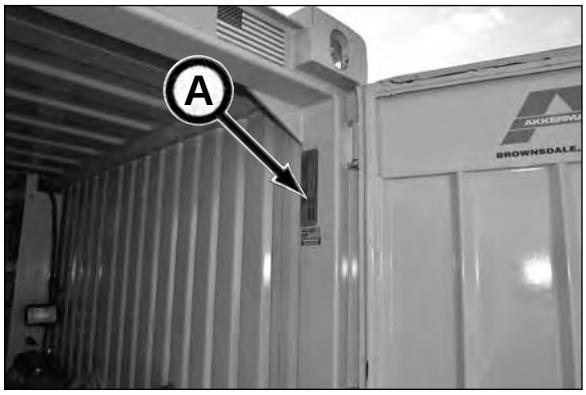
Identification Numbers

Model and serial numbers are required when ordering parts or requesting service information. Record your model and serial numbers below.

P4075D Power Pack (A)

Model Number _____P4075D_____

Serial Number _____



NOTES

Safety Data Sheets

The Federal Occupational, Safety, and Health Administration (OSHA) Standard 29 CFR 1910.1200, require that specific safety data sheets (SDS) be available to employees before operating this equipment. This may include information on substances contained in this equipment such as hydraulic fluid and gear lubricant.

Akkerman Inc. will provide, at no cost, SDS which apply to its product line. Simply contact your Akkerman Aftermarket Support representative for a copy.

To ensure a prompt response to your SDS request, include your return address (including zip or postal code) and the equipment's model numbers and serial numbers with your request.

NOTES

Warranty

Akkerman warrants that all equipment manufactured by it be free from defects due to workmanship or material when normally used and serviced for a period of 90 days from the date of shipment by Akkerman. Normal wear and tear to the equipment, including, but not limited to, wear on the cutter face tooling, hydraulic filters, augers, casings, slurry line and seals is not covered by this warranty. Akkerman does not warrant that the equipment meets the requirements of any particular safety code or rule governing equipment classification. If the Customer has questions about local safety codes, rules or ordinances, authorities local to the project should be consulted.

In order to be considered as a potential warranty claim, the component in question must be returned to Akkerman (freight prepaid) for factory inspection and analysis, and determination of warranty applicability. No warranty is provided for electronics or electrical components of any kind. The validity of all warranty claims are subject to the discretion and determination of the Akkerman Aftermarket Support Department. All such determinations are final.

NOTES

Alphabetical Index

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Parts
Contents

INTRODUCTION

This parts section of the manual contains assembly illustrations of the Akkerman P4075D Power Pack. The illustrations in this section are intended to show typical construction of various parts. In some instances, the details of parts illustrated may not exactly represent their actual appearance, but will help to identify parts performing the same functions.

LOCATING PARTS

This manual is organized to help you locate parts information quickly. An Alphabetical Index, Section 16, is provided to determine the page number of the assembly a part is used. If the part number is known, the Numerical Index, Section 18, can also be utilized to find the page number of the assembly.

USE GENUINE AKKERMAN PARTS

The use of second-rate parts could affect the efficient performance of the Power Pack. ALWAYS use genuine Akkerman parts.

PARTS ORDERING

To order fast, accurate, and reliable parts service, call (800) 533-0386, (507) 567-2261, or fax (507) 567-2720, and provide the following information.

1. Model Number
2. Serial Number
3. Part Number, Description, and Quantity
4. Shipping Preference

MEASUREMENTS

The unit of measure in this manual is in inches unless indicated otherwise.

HARDWARE SPECIFICATION

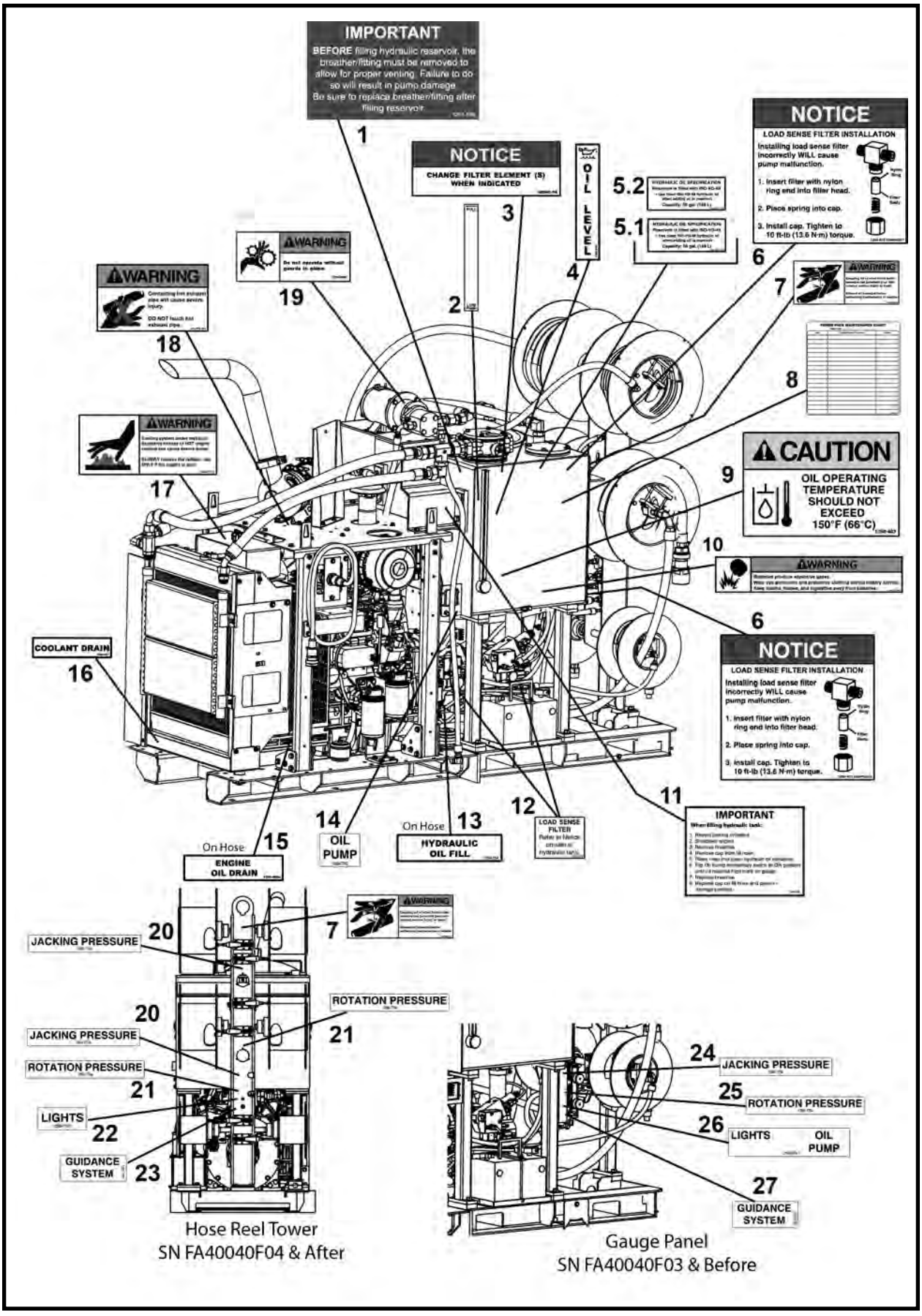
All Akkerman products are assembled with SAE Grade 8 bolts, nuts, and washers unless otherwise noted. ALWAYS use matched fastener hardware when replacing or repairing the unit.

If you find any errors with this manual or have any suggestions for improvement, please let us know. Mail your suggestions to:
Akkerman Inc, ATTN: Technical Publications, 58256 266th Street, Brownsdale, MN 55918.

Akkerman Inc. reserves the right to improve its product without notice or obligation.

NOTES

P4075D POWER PACK DECALS - POWER UNIT

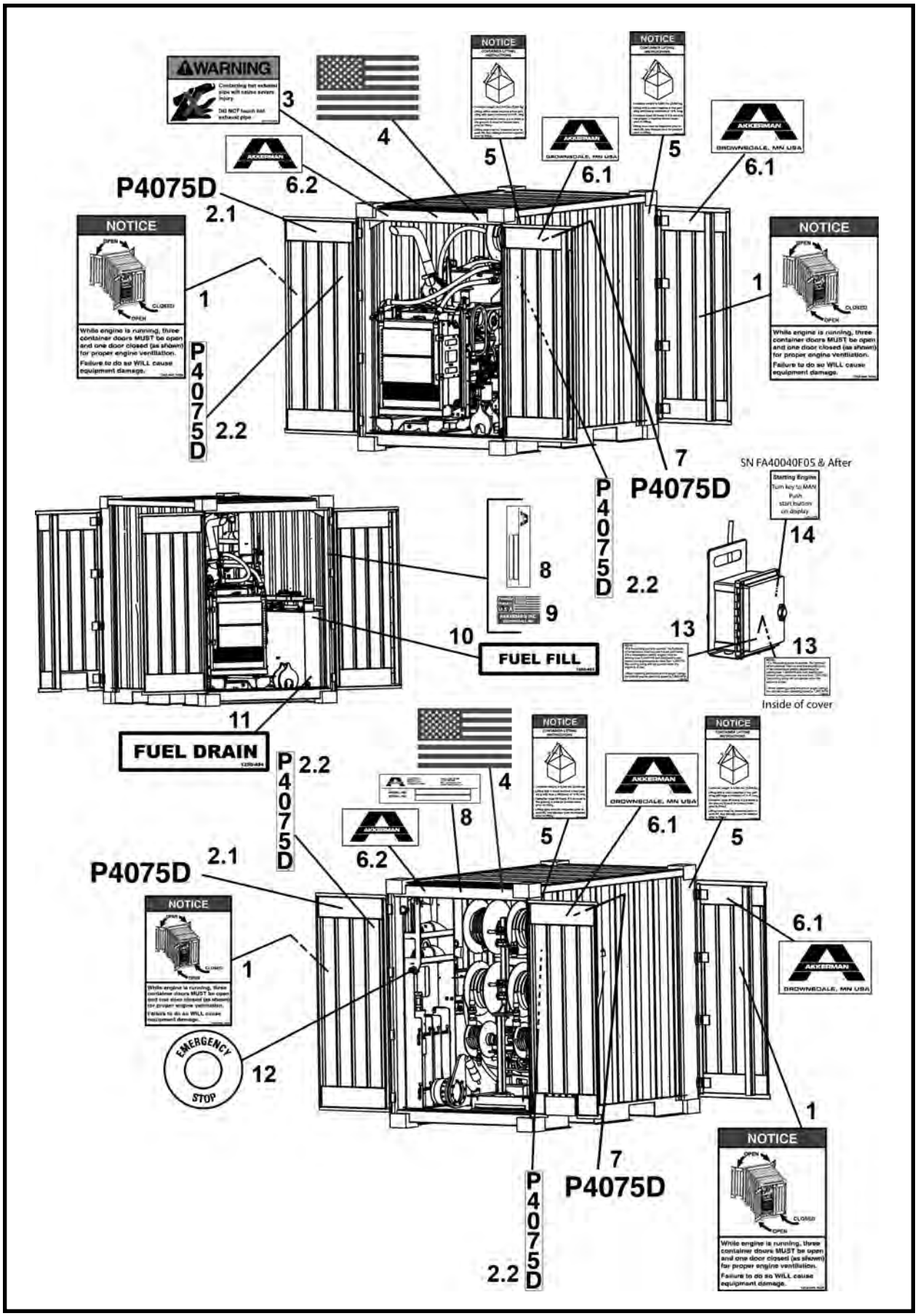


*P4075D POWER PACK DECALS - POWER UNIT

ITEM	QTY	PART NO.	DESCRIPTION
1	1	1251-598	DECAL, Important, Remove Breather/Fitting
2	1	1250-932	DECAL, Oil Level Gauge
3	1	40000-16	DECAL, Notice, Change Filter
4	1	1250-649	DECAL, Oil Level
5.1	1	1251-977	DECAL, Hyd Oil Spec ISO-VG-46
5.2	1	1251-978	DECAL, Hyd Oil Spec ISO-VG-68
6	2	1250-872	DECAL, Notice, Load Sense Filter Installation
7	2	1251-593	DECAL, Warning Escaping Fluid
8	1	1250-724	DECAL, Power Pack Maintenance Chart
9	1	1250-483	DECAL, Caution, Oil Temperature
10	1	1251-016	DECAL, Warning, Batteries Produce Explosive Gas
11	1	1252-008	DECAL, Important Hyd Fill Procedure
12	2	1250-873	DECAL, Load Sense Filter
13	1	1250-854	OVERLAY, Hydraulic Oil Fill
14	1	1250-775I	DECAL, Oil Pump
15	1	1250-498C	OVERLAY, Engine Oil Drain
16	1	1250-527	DECAL, Coolant Drain
17	1	1250-697	DECAL, Warning, Cooling System Under Pressure
18	1	1250-777A	DECAL, Warning, Hot Exhaust Pipe
19	1	1250-004	DECAL, Warning Guards In Place
20	2	1250-775B	DECAL, Jacking Pressure (SN FA40040F04 & After)
21	2	1250-775C	DECAL, Rotation Pressure (SN FA40040F04 & After)
22	1	1250-775H	DECAL, Lights (SN FA40040F04 & After)
23	1	1251-778	DECAL, Guidance System (SN FA40040F04 & After)
24	1	1250-775B	DECAL, Jacking Pressure (SN FA40040F03 & Before)
25	1	1250-775C	DECAL, Rotation Pressure (SN FA40040F03 & Before)
26	1	1250-775A1	DECAL, Lights - Oil Pump (SN FA40040F03 & Before)
27	1	1251-778	DECAL, Guidance System (SN FA40040F03 & Before)

* Part of 1255-036 KIT, Decal P4075D

P4075D POWER PACK DECALS - CONTAINER

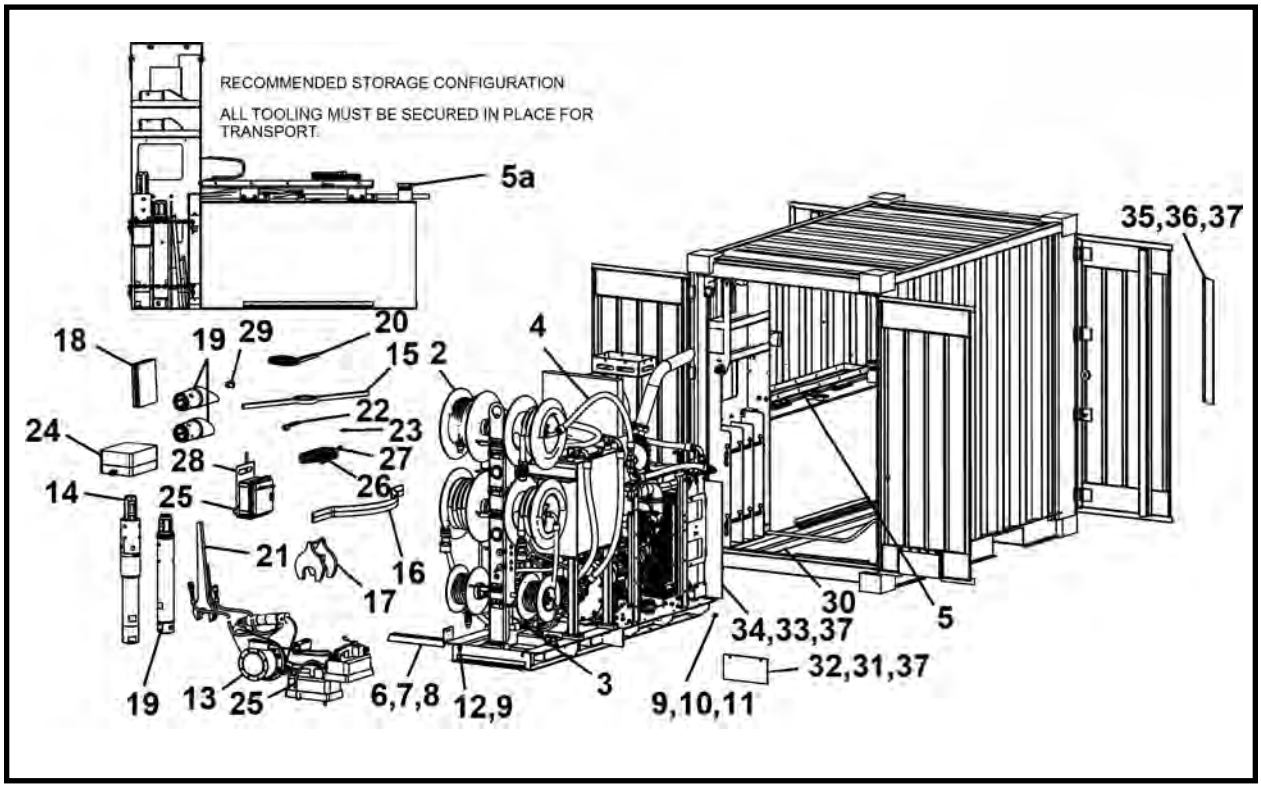


*P4075D POWER PACK DECALS - CONTAINER

ITEM	QTY	PART NO.	DESCRIPTION
1	4	1252-040	DECAL, Notice, One Door Closed
2.1	2	1251-719	DECAL, P4075D - Large (Earlier Models)
2.2	4	1251-719V	DECAL, P4075D - Vertical (Later Models)
3	1	1250-777A	DECAL, Hot Exhaust Pipe
4	2	1250-558	DECAL, USA Flag - Small
5	4	1250-778	DECAL, Lifting Instructions
6.1	4	1251-246	DECAL, Akkerman - Large (Earlier Models)
6.2**	2	1251-246	DECAL, Akkerman - Large (Later Models)
7	2	1251-719A	DECAL, P4075D - Small (Earlier Models)
8	2	REF	PLATE, Serial Number
9	1	1250-544	DECAL, Made In USA
10	1	1250-493	DECAL, Fuel Fill
11	1	1250-494	DECAL, Fuel Drain
12	1	P0310-474F	DECAL, Emergency Stop
13	2	1252-042	DECAL, Cooling Pump Operation
14	1	1252-099	DECAL, Start Engine (FA40040F05 & After)

* Part of 1255-036 KIT, Decal P4075D
** Trim “Brownsdale MN USA” from decal.
REF - Reference

P4075D POWER PACK ASSEMBLY, FA40040F



ITEM	QTY	PART NO.	DESCRIPTION
0	1	FA40040F	POWER PACK ASSEMBLY
1*	1	A48386A	ASSEMBLY, Container
2*	1	A48366A	ASSEMBLY, Power Unit
3*	1	A48385A	ASSEMBLY, Electrical (not shown)
4*	1	A48343A	ASSEMBLY, Hydraulics (not shown)
5*	1	A48342A	ASSEMBLY, Fuel Lines (Includes item 5a)
5a	1	P0125-123	CAP, Diesel Fuel
6.1	1	A48662A	GUARD, Hose (SN FA40040F03 & Before)
6.2	1	A08891P	GUARD, Hose (SN FA40040F04 & After)
7	2/1	P0040-004	WASHER, Hardened Flat 1/4
8	2/1	P0001-04-002	BOLT, Hex 1/4 UNC x .5
9	7	P0040-008	WASHER,Hardened Flat 1/2
10	2	P0013-08-000	NUT, Lock 1/2 UNC
11	2	P0001-08-006	SCREW, Hex Cap 1/2 UNC x 1.5
12	3	P0001-08-003	BOLT, Hex 1/2 UNC x .75
13	1	FA40230F	DUAL TUBE BREAKOUT TOOL
14	1	FA41403F	ADAPTER, Reaming Head
15	1	FA40482F	SCRAPER, Pilot Tube
16	2	A40118P	SUPPORT, Pilot Tube
17	1	FA42240F	ASSEMBLY, Break-out Tool Launch
18	1	050126A	MANUAL, P4075D Operation & Parts
19	1	FA40245F	ASSEMBLY, Steering Head
20	1	F0095-105	WRENCH, Chain
21	1	FA40244F	WRENCH SET
22	1	F0095-103	WRENCH, Spanner
23	25	P0085-228	ORING
24	1	A03883A	KIT, Nitrogen Purge
25	8	003060A00	TIE DOWN
26	2	P0054-169	CABLE

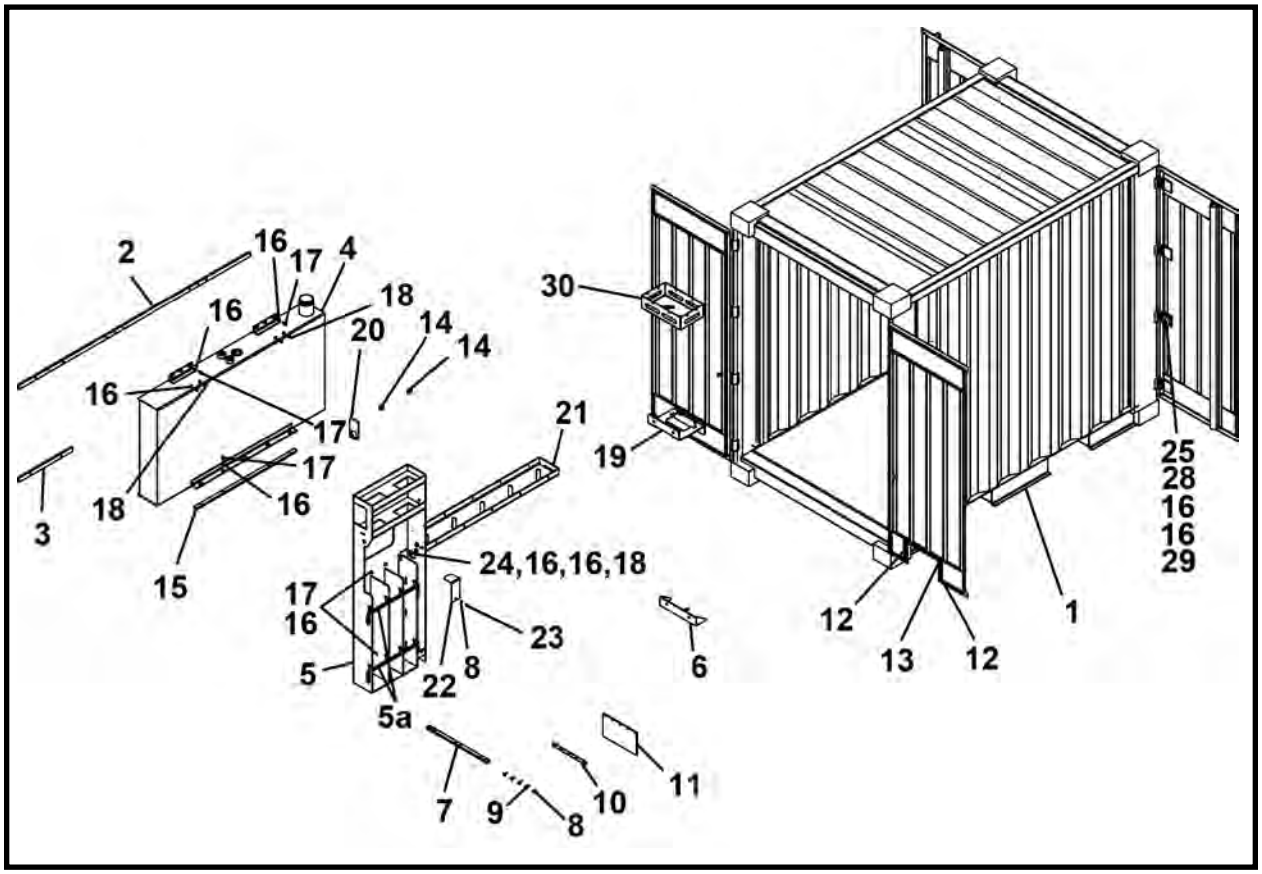
P4075D POWER PACK ASSEMBLY, FA40040F

ITEM	QTY	PART NO.	DESCRIPTION
27	2	P0054-195	CABLE, Adapter Extension
28*	1	A48682A	ASSEMBLY, Pendant Hanger
29	1	A47915P	WRENCH, Pilot Tube Cap
30	168 LI	P0122-005	TAPE, Anti Skid 4”
31	1	A02721P	MOUNT, Lower Rubber
32	1	A02727P	RUBBER, Motor Seal - Bottom
33	1	A02719P	MOUNT, Rubber - Wall Side
34	1	A02728P	RUBBER, Motor Seal - Side
35	1	A02726P	RUBBER, Door Seal
36	1	A02723P	MOUNT, Door Rubber
37	7	P0035-012	SCREW, Drill Hex Head 1/4 x 1
38	1	1255-036	KIT, Decal P4075D

LI - Linear Inch

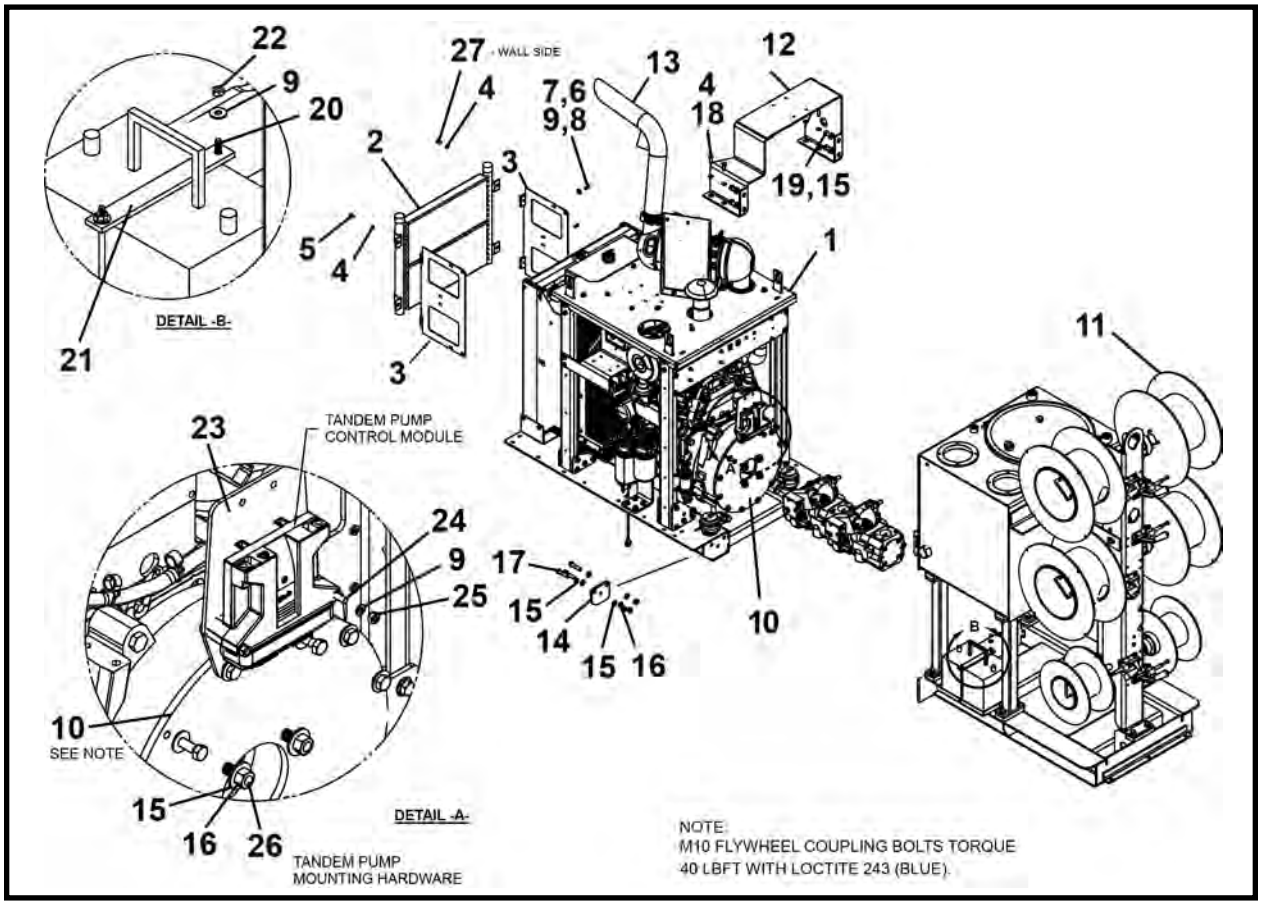
* Refer to this section for parts information.

CONTAINER ASSEMBLY, A48386A



ITEM	QTY	PART NO.	DESCRIPTION
0	1	A48386A	CONTAINER ASSEMBLY
1	1	P0125-120	CONTAINER
2	1	A48398P	MOUNT, Rack -Long
3	1	A48399P	MOUNT, Rack -Sort
4	1	A48378A	TANK, Fuel 50 Gallon
5	1	A48387A	RACK, Tooling (Includes item 5a)
5a	1	P0094-004	CHAIN
6	1	A48668A	MOUNT, Power Unit
7	1	A42788P	SPACER
8	6	P0040-004	WASHER, Hardened Flat 1/4
9	5	P0035-008	SCREW, Self Tap 1/4 x 1
10	1	A44722P	MOUNT, Door Flap
11	1	A40749P	RUBBER, Door Flap
12	2	A40728P	TUBE, Rectangular
13	1	A40719P	MOUNT, Door Flap
14	2	A48597P	MOUNT, Clip
15	1	A48345P	BAR, Bolt
16	28	P0040-006	WASHER, Hardened Flat 3/8
17	12	P0001-06-003	BOLT, Hex 3/8 UNC x .75
18	6	P0001-06-004	BOLT, Hex 3/8 UNC x 1
19	1	A08899P	HANGER, Breakout Tool
20	1	A48595P	PLATE, Fuel Gauge
21	1	A48321A	SHELF
22	1	A49942P	CAP, Wire Channel
23	1	P0001-04-002	BOLT, Hex 1/4 UNC x .5
24	2	P0003-06-000	NUT, Hex 3/8 UNC
25	4	P0253-112	BUMPER, Rubber 1 x 2.5
26*	1	A08898P	BAR, Tool Hanger (Not Shown)
27*	1	A02718P	BAR (Not Shown)
28	4	P0001-06-008	BOLT, Hex 3/8 UNC x 2
29	4	P0013-06A-000	NUT, Nylock 3/8 UNC
30	1	A49351P	PLATE, Shelf

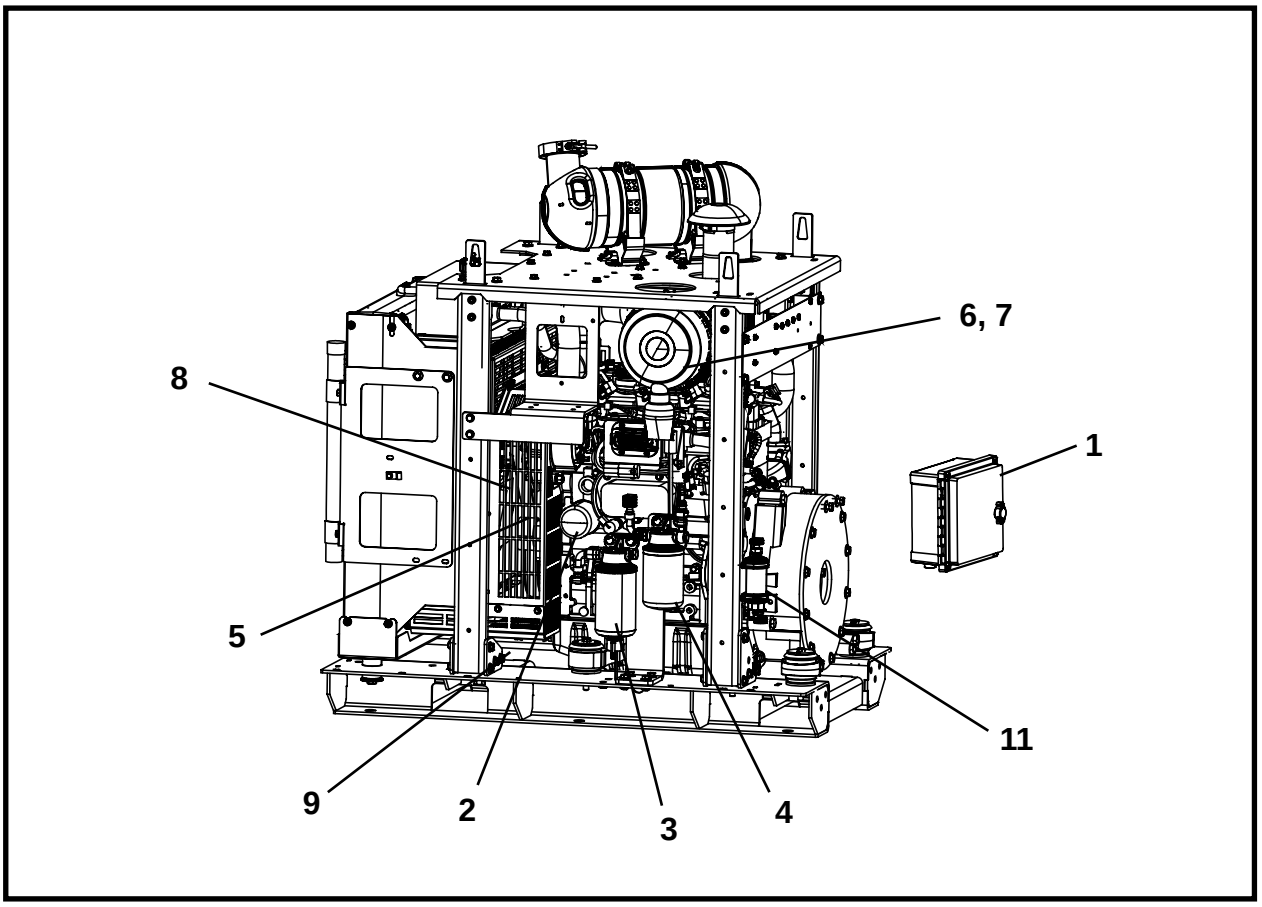
P4075D POWER UNIT ASSEMBLY, A48366A



ITEM	QTY	PART NO.	DESCRIPTION
0	1	A48366A	POWER UNIT ASSEMBLY
1*	1	P0125-153	ENGINE, Diesel 74HP
2	1	P0125-121B	OIL COOLER
3	2	A48374A	MOUNT, Cooler
4	8	P0040-006	WASHER, Hardened Flat 3/8
5	2	P0001-06-002	BOLT, Hex 3/8 UNC x .5
6	4	PM08A-1.25-016	BOLT, Hex 8x1.25x16 10.9
7	4	P0040-005	WASHER, Hardened Flat 5/16
8	2	PM6A-16-1.00	BOLT, Hex H M6x1.00x16 10.9
9	8	P0040-004	WASHER, Hardened Flat 1/4
10	1	P0125-154	KIT, Pump Drive (Includes items 10a and 10b)
10a	1	P0125-154A	FLANGE, Drive
10b	1	P0125-154B	HUB
11*	1	A48367A	ASSEMBLY, Tank & Skid
12	1	A40693A	MOUNT, Cooling Tank
13	1	A49162P	PIPE, Exhaust
14	2	A48358P	PLATE, BOLT
15	20	P0040-008	WASHER, Hardened Flat 1/2
16	10	P0003-08-000	NUT, Hex 1/2 UNC
17	6	P0001-08-008	BOLT, Hex 1/2 UNC x 2
18	4	PM10A-1.50-030	BOLT, Hex M10x1.50 x 30 10.9
19	4	P0001-08-004	BOLT, Hex 1/2 UNC x 1
20	2	A44455P	CLAMP, Battery
21	1	012945P00	CROSS BAR, Battery Clamp
22	2	P0003-04-000	NUT, Hex 1/4 UNC
23	1	A48377P	PLATE, Lift Pump Mount
24	2	P0001-04-010	BOLT, Hex 1/4 UNC x 2.5
25	2	P0013-04-000	NUT, Nylock 1/4 x 20
26	4	P0025-002A	BOLT, 1/2 UNC x 1.5
27	2	P0001-06-004	BOLT, Hex 3/8 UNC x 1

* Refer to this section for parts information.

DIESEL ENGINE 74 HP, P0125-153



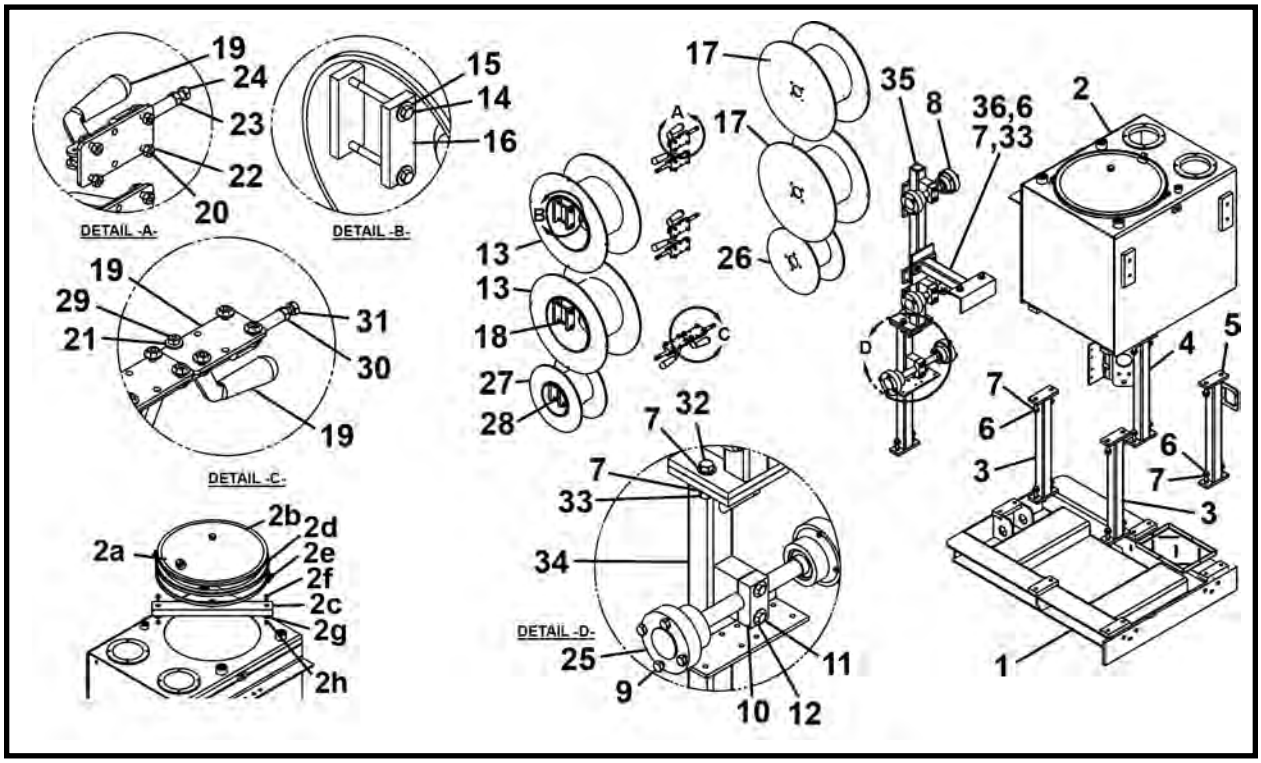
ITEM	QTY	PART NO.	DESCRIPTION
0	1	P0125-153	ENGINE, Diesel 74HP
1	1	P0125-153A	PENDANT ASSEMBLY
2	1	P0125-153B	FILTER, Oil - Spin On
3	1	P0125-153C	FILTER, Fuel
4	1	P0125-153D	FILTER, Fuel - Spin On
5	1	P0125-153E	BELT, V Ribbed
6	1	P0125-153F	FILTER, Air (Air Intake)
7	1	P0125-153G	CARTRIDGE, Safety (Air Intake)
8	1	P0125-153H	FAN, Sucker
9	1	P0125-153J	HOSE, Drain
10*	1	P0125-153K	COUPLING, Fuel Line Return
11	1	P0125-153L	PUMP, Fuel Supply

* Not Shown

NOTES

TANK & SKID ASSEMBLY, A48367A

P4075D (SN FA40040F-03 & BEFORE)



ITEM	QTY	PART NO.	DESCRIPTION
0	1	A48367A	TANK & SKID ASSEMBLY
1	1	A48350A	SKID
2	1	A48362A	TANK, Hydraulic (Includes items 2a - 2h)
2a	1	P0416-004	PLUG, Square Head 3/4
2b	1	P0308-105	KIT, End Cover
2c	1	P0308-104	BRACKET, End Cover
2d	1	P0201-224	CLAMP, Hose
2e	1	P0201-218	CLAMP, Tube
2f	2	P0001-06-003	BOLT, Hex UNC x .75
2g	2	P0040-006	WASHER, Hardened Flat 3/8
2h	2	P0003-06-000	NUT, Hex 3/8 UNC
3	2	A48363A	LEG, Tank
4	1	A48364A	LEG, With Gauges
5	1	A48679A	LEG, With Fuse Box
6	20	P0001-08-005	SCREW, Hex 1/2 UNC x 1.25
7	30	P0040-008	WASHER, Hardened Flat 1/2
8	2	A43566A	HUB, Short
9	24	P0001-06-003	BOLT, Hex 3/8 UNC x .75
10	3	A43560P	MOUNT, Front Shaft
11	6	P0001-06-007	BOLT, Hex 3/8 UNC x 1.75
12	6	P0040-006	WASHER, Hardened Flat 3/8
13	2	A42610A	REEL, Right 3/4-1
14	2	P0001-05-014	BOLT, Hex 5/16 UNC x 3.5
15	12	P0040-005	WASHER, Hardened Flat 5/16
16	4	A42521P	MOUNT, Reel Plate
17	2	A42624A	REEL, Left 3/4-1
18	10	P0001-05-012	BOLT, Hex 5/16 UNC x 3
19	6	P0059-061	CLAMP, Toggle
20	24	P0001-04-003	BOLT, Hex 1/4 UNC x .75
21	33	P0040-004	WASHER, Hardened Flat 1/4

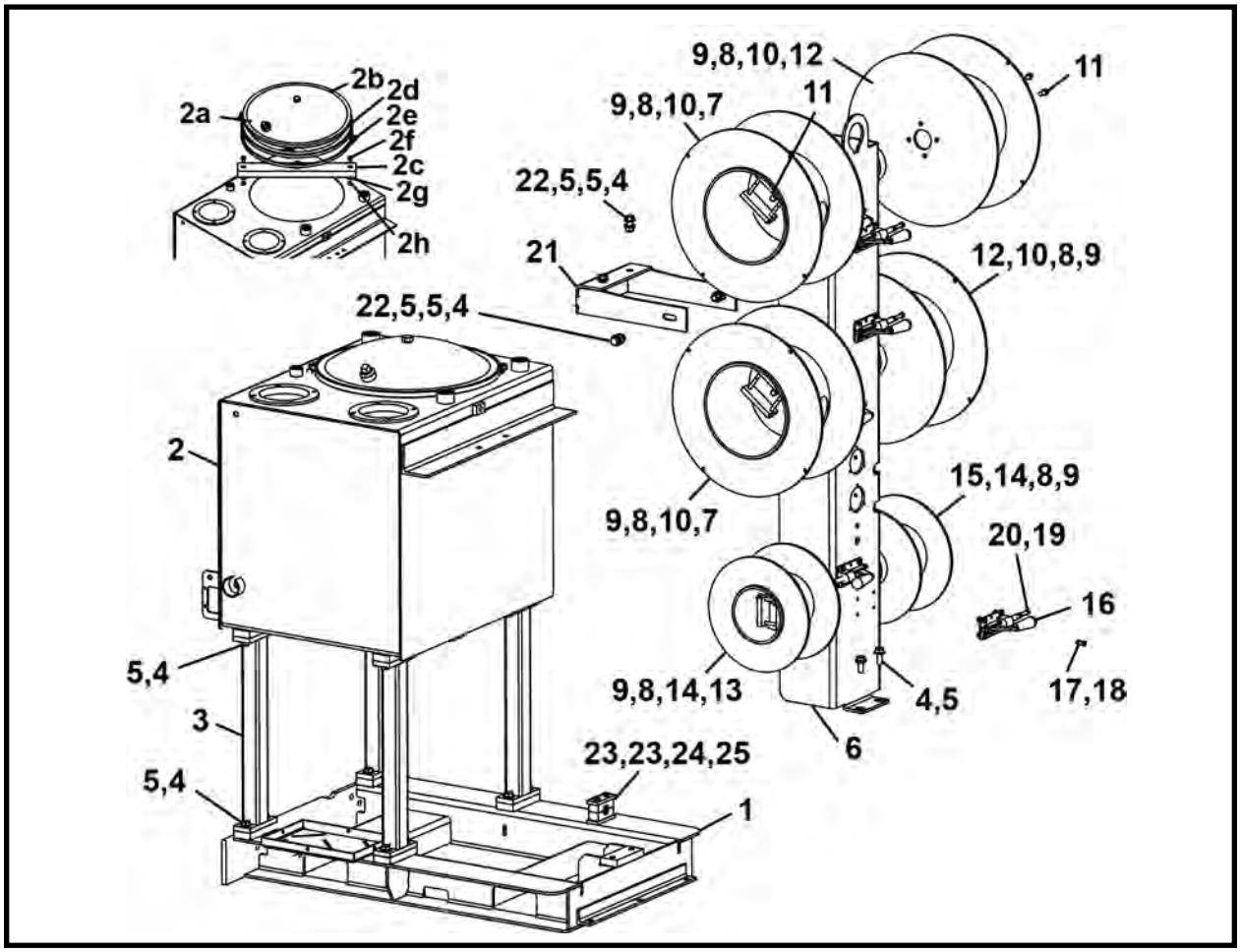
TANK & SKID ASSEMBLY, A48367A

P4075D (SN FA40040F-03 & BEFORE)

ITEM	QTY	PART NO.	DESCRIPTION
22	16	P0003-04-000	NUT, Hex 1/4 UNC
23	4	P0003-05-000	NUT, Hex 5/16 UNC
24	4	P0001-05-005	BOLT, Hex 5/16 UNC x 1.25
25	1	A43557A	HUB, Short
26	1	A42618A	REEL, Left 3/8
27	1	A42623A	REEL, Right 3/8
28	2	A42518P	MOUNT, Reel Plate
29	8	P0003-04-000	NUT, Hex 1/4 UNC
30	2	P0003-05-000	NUT, Hex 5/16 UNC
31	2	P0001-05-004	BOLT, Hex 5/16 UNC x 1
32	4	P0001-08-006	BOLT, Hex 1/2 UNC x 1.5
33	6	P0003-08-000	NUT, Hex 1/2 UNC
34	1	A48370A	SUPPORT, Reel - Lower
35	1	A43564A	MOUNT, Reel
36	1	A48369A	BRACE, Reel

TANK & SKID ASSEMBLY, A48367A

P4075D (SN FA40040F-04)



ITEM	QTY	PART NO.	DESCRIPTION
0	1	A48367A	TANK & SKID ASSEMBLY
1	1	A48350A	SKID
2	1	A48362A	TANK, Hydraulic (Includes items 2a - 2h)
2a	1	P0416-004	PLUG, Square Head 3/4
2b	1	P0308-105	KIT, End Cover
2c	1	P0308-104	BRACKET, End Cover
2d	1	P0201-224	CLAMP, Hose
2e	1	P0201-218	CLAMP, Tube
2f	2	P0001-06-003	BOLT, Hex UNC x .75
2g	2	P0040-006	WASHER, Hardened Flat 3/8
2h	2	P0003-06-000	NUT, Hex 3/8 UNC
3	4	A48363A	LEG, Tank
4	22	P0001-08-005	SCREW, Hex 1/2 UNC x 1.25
5	26	P0040-008	WASHER, Hardened Flat 1/2
6	1	A08335A	MOUNT, Reel
7	2	A42624A	REEL, Left 3/4-1
8	12	P0001-05-012	BOLT, Hex 5/16 UNC x 3
9	12	P0040-005	WASHER, Hardened Flat 5/16
10	4	A42521P	MOUNT, Reel Plate
11	24	P0001-06-003	BOLT, Hex 3/8 UNC x .75
12	2	A42610A	REEL, Right 3/4-1
13	1	A42618A	REEL, Left 3/8
14	2	A42518P	MOUNT, Reel Plate
15	1	A42623A	REEL, Right 3/8

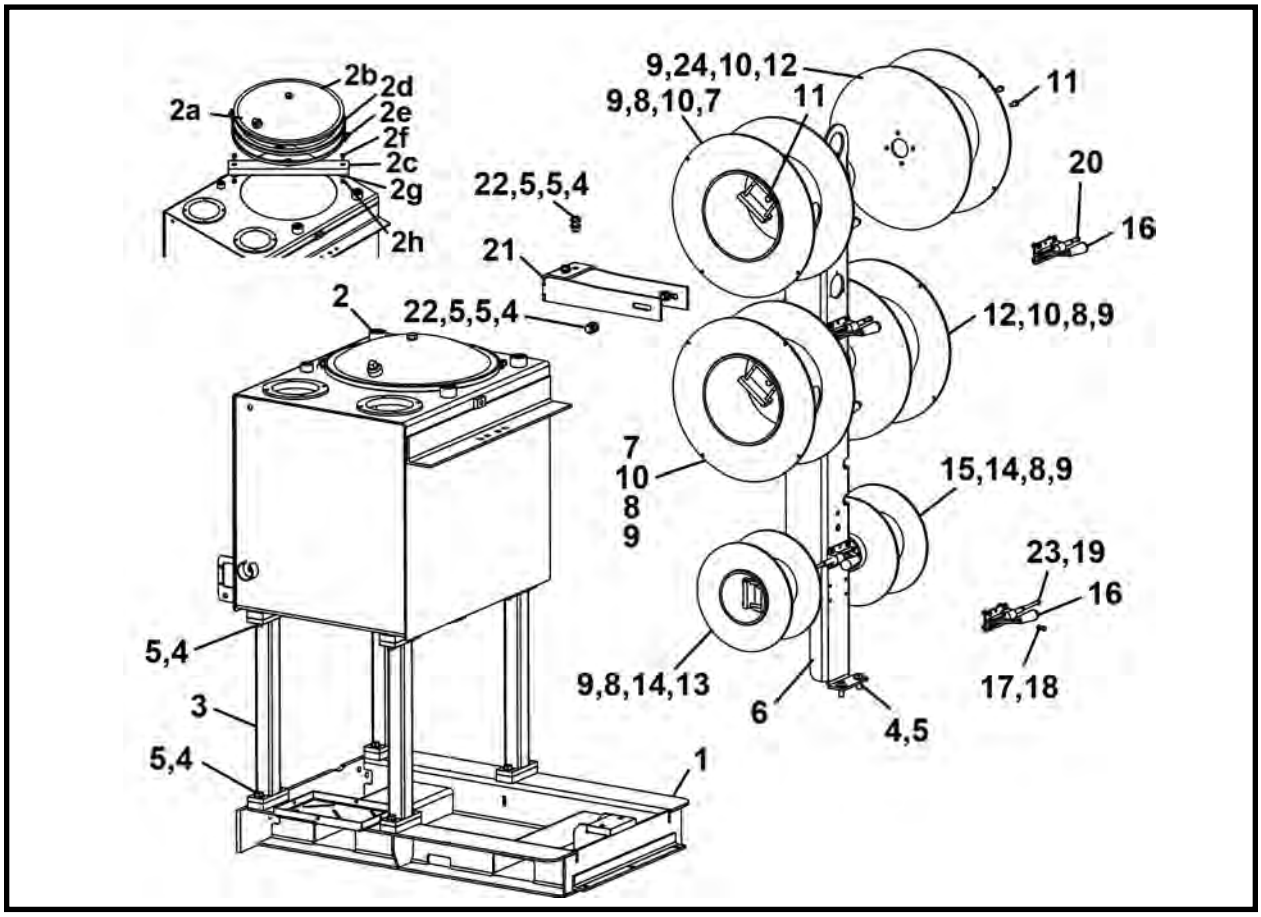
TANK & SKID ASSEMBLY, A48367A

P4075D (SN FA40040F-04)

ITEM	QTY	PART NO.	DESCRIPTION
16	6	P0059-061	CLAMP, Toggle
17	24	P0001-04-003	BOLT, Hex 1/4 UNC x .75
18	24	P0003-04-000	NUT, Hex 1/4 UNC
19	6	P0003-05-000	NUT, Hex 5/16 UNC
20	6	P0001-05-008	BOLT, Hex 5/16 UNC x 2
21	1	A08334A	SUPPORT, Reel
22	4	P0003-08-000	NUT, Hex 1/2 UNC
23	2	P0059-050A	CLAMP SET 3/4
24	1	P0059-050B	PLATE, Cover
25	2	P0059-050D	BOLT, Hex 3/8 x 2.25

TANK & SKID ASSEMBLY, A48367A

P4075D (SN FA40040F-05 & AFTER)



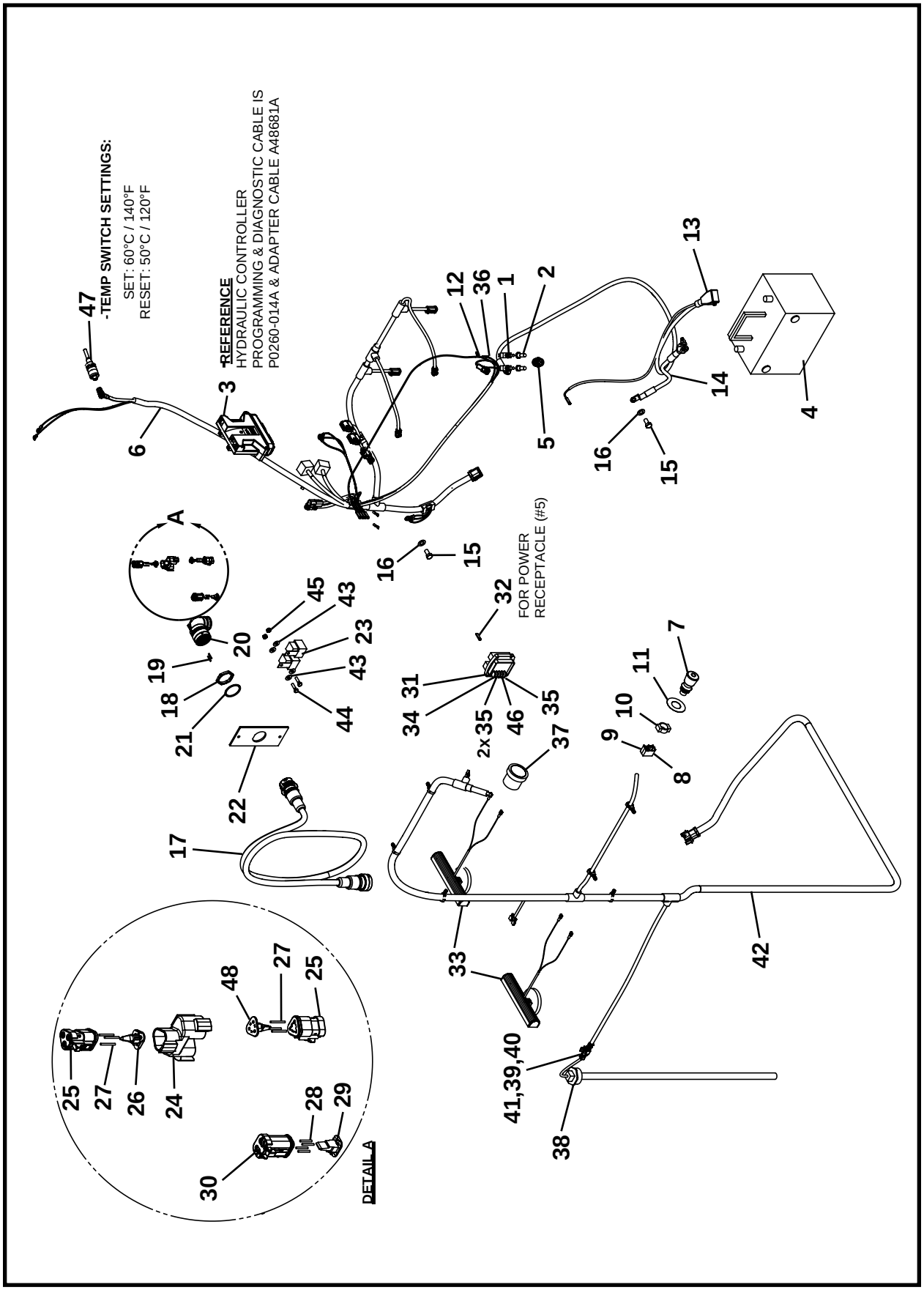
ITEM	QTY	PART NO.	DESCRIPTION
0	1	A48367A	TANK & SKID ASSEMBLY
1	1	A48350A	SKID
2	1	A48362A	TANK, Hydraulic (Includes items 2a - 2h)
2a	1	P0416-004	PLUG, Square Head 3/4
2b	1	P0308-105	KIT, End Cover
2c	1	P0308-104	BRACKET, End Cover
2d	1	P0201-224	CLAMP, Hose
2e	1	P0201-218	CLAMP, Tube
2f	2	P0001-06-003	BOLT, Hex UNC x .75
2g	2	P0040-006	WASHER, Hardened Flat 3/8
2h	2	P0003-06-000	NUT, Hex 3/8 UNC
3	4	A48363A	LEG, Tank
4	22	P0001-08-005	SCREW, Hex 1/2 UNC x 1.25
5	26	P0040-008	WASHER, Hardened Flat 1/2
6	1	A08396A	MOUNT, Reel
7	2	A42624A	REEL, Left 3/4-1
8	10	P0001-05-012	BOLT, Hex 5/16 UNC x 3
9	12	P0040-005	WASHER, Hardened Flat 5/16
10	4	A42521P	MOUNT, Reel Plate
11	24	P0001-06-003	BOLT, Hex 3/8 UNC x .75
12	2	A42610A	REEL, Right 3/4-1
13	1	A42618A	REEL, Left 3/8
14	2	A42518P	MOUNT, Reel Plate
15	1	A42623A	REEL, Right 3/8
16	6	P0059-061	CLAMP, Toggle

TANK & SKID ASSEMBLY, A48367A

P4075D (SN FA40040F-05 & AFTER)

ITEM	QTY	PART NO.	DESCRIPTION
17	24	P0001-04-003	BOLT, Hex 1/4 UNC x .75
18	24	P0003-04-000	NUT, Hex 1/4 UNC
19	6	P0003-05-000	NUT, Hex 5/16 UNC
20	4	P0001-05-008	BOLT, Hex 5/16 UNC x 2
21	1	A08395A	SUPPORT, Reel
22	4	P0013-08A-000	NUT, Nyloc 1/2 UNC
23	2	P0001-05-016	BOLT, Hex 5/16 UNC x 4
24	2	P0001-05-014	BOLT, Hex 5/16 UNC x 3.5

ELECTRICAL ASSEMBLY, A48385A



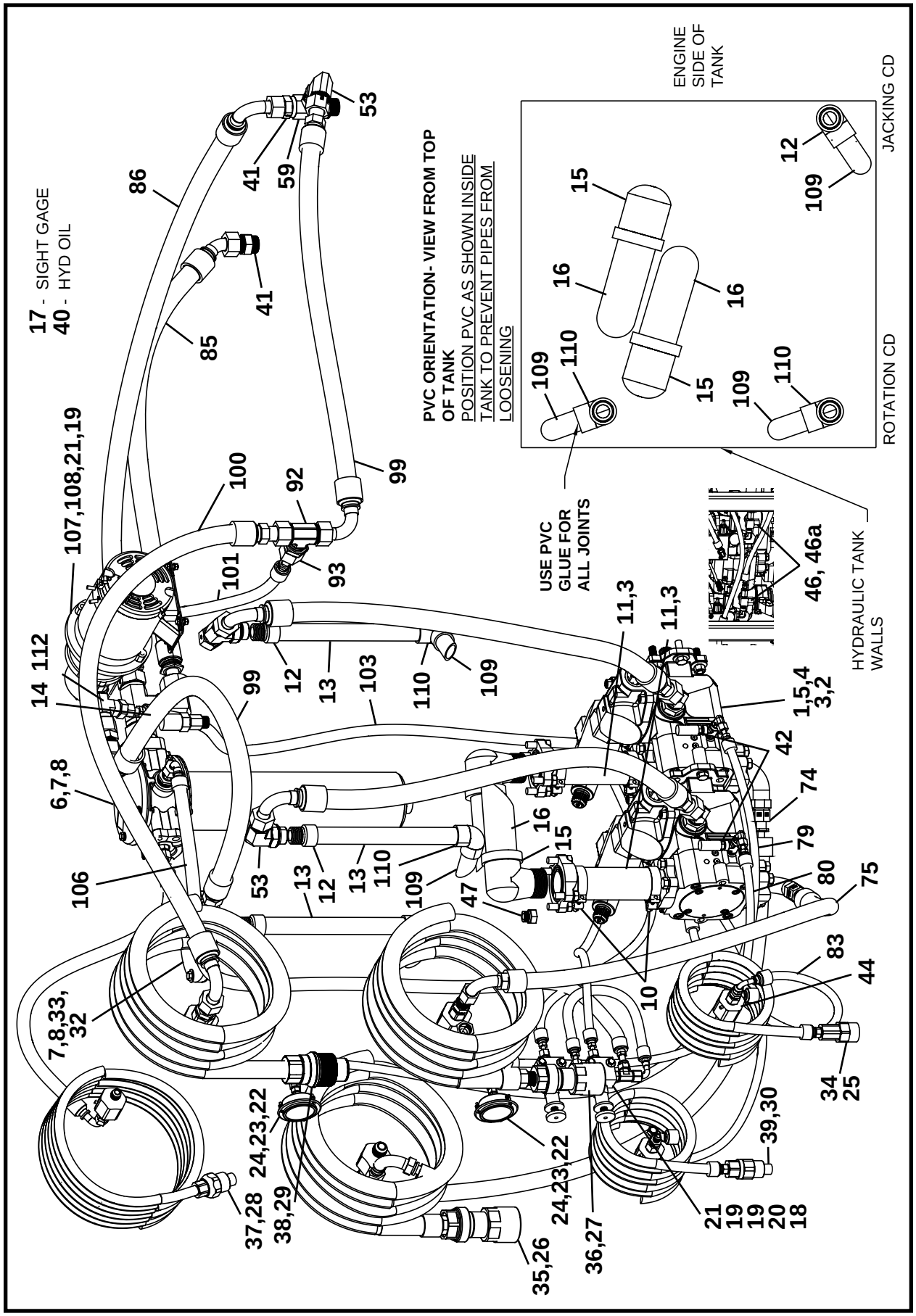
ELECTRICAL ASSEMBLY, A48385A

ITEM	QTY	PART NO.	DESCRIPTION
0		A48385A	ELECTRICAL ASSEMBLY
1	2	P0056-009	SWITCH, Toggle
2	2	P0056-010	BOOT, Toggle Switch
3.1	1	S10058A	ASSEMBLY, Controller (used with pump with 1.8 amp coil)
3.2	1	S10090A	ASSEMBLY, Controller (used with pump with 2.5 amp coil)
4	1	P0064-019	BATTERY
5	1	A49406A	ASSEMBLY, Guidance Sys Pwr Receptacle
6	1	A48498A	WIRE HARNESS
7	1	P0310-420F	PUSH BUTTON, Illuminated E-Stop
8	1	P0251-171	LED MODULE
9	1	P0056-122F	CONTACT BLOCK
10	1	P0310-419F	LATCH, Mounting
11	1	P0310-474F	DECAL, Emergency Stop
12	120 LI	P0054-012	WIRE
13	1	A48599A	ASSEMBLY, Battery Cable
14	1	A48598A	ASSEMBLY, Negative Battery Cable
15	2	PM10A-1.50-020	BOLT, Hex M10x1.50 x 20 10.9
16	2	P0040-007	WASHER, Hardened Flat 7/16
17	1	A48384A	CORD, Pendant
18	1	P0313-095	NUT, Panel -Plastic
19	2	P0313-052	CONNECTOR
20	1	P0313-006	SOCKET
21	1	P0313-010	WASHER
22	1	A48344P	PLATE, Pendant Cord Mount
23	1	P0056-158	RELAY, 12VDC
24	1	P0313-092	RECEPTACLE
25	2	P0313-069	PLUG
26	2	P0313-069B	PLUG
27	6	P0313-093	SOCKET
28	4	P0313-008	SOCKET
29	1	P0313-067A	PLUG
30	1	P0313-067	PLUG
31	1	P0251-617	PANEL, Fuse
32	2	P0251-416A	TERMINAL
33.1	2	P0053-026	LIGHT, Halogen Flood
33.2	2	016409A	LIGHT, LED
34	1	P0251-936	FUSE, 40 Amp
35	3	P0251-413	FUSE, 10 Amp
36	3	P0055-001	TERMINAL
37	1	P0125-156	GAUGE, Fuel
38	1	P0125-157	SENDING UNIT, Fuel
39	1	P0313-076A	RECEPTACLE
40	1	P0313-076	RECEPTACLE
41	2	P0313-078	PIN
42	1	A48499A	WIRE HARNESS
43	4	P0040-004	WASHER, Hardened Flat 1/4
44	2	P0001-04-003	BOLT, Hex 1/4 UNC x .75
45	2	P0013-04-000	NUT, Nylock 1/4
46	1	P0251-412	FUSE, 3 A DC
47	1	P0251-543	SWITCH, Temp
48	1	P0313-069A	PLUG, 3 Way

LI - Linear Inch

NOTE: For electrical schematics, refer to section 11, Troubleshooting.

HYDRAULIC ASSEMBLY, A48343A

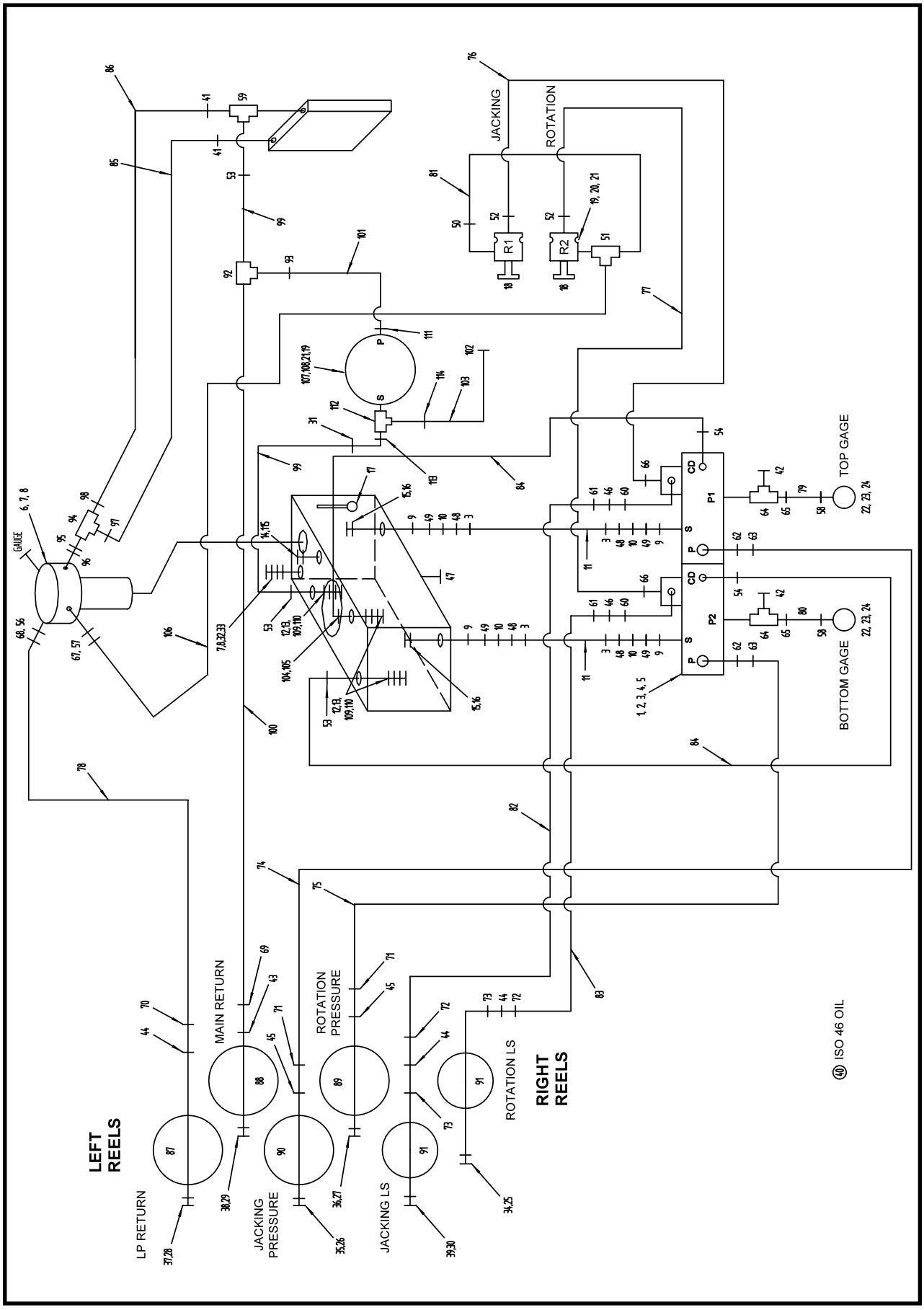


HYDRAULIC ASSEMBLY, A48343A

ITEM	QTY	PART NO.	DESCRIPTION
0	1	A48343A	HYDRAULICS ASSEMBLY
1*	1	P0303-372	PUMP
2	6	P0040-008	WASHER, Hardened Flat 1/2
3	18	P0001-08-006	SCREW, Hex Cap 1/2UNC x 1.5
4	4	P0003-08-000	NUT, Hex 1/2 UNC
5	4	P0025-002A	BOLT, 1/2 UNC x 1.5
6	1	P0309-212	FILTER, Intake
7	8	P0040-006	WASHER, Hardened Flat 3/8
8	8	P0001-06-004	BOLT, Hex 3/8 UNC x 1
9	4	P0220-225	INSERT, 61-32FL
10	4	P0201-180	CLAMP, T-Bolt
11	20 LI	P0201-159	HOSE, Hydraulic 2”
12	3	P0258-058	ADAPTER, Male 1 NPT
13	3	A40044P	PIPE, PVC 1 x 13.63
14	1	P0309-185	BREATHER, Pressure Vacuum
15	2	P0258-056	ELBOW, Street 2” NPT 90°
16	2	A40761P	PIPE, PVC 2 x 6.50
17	1	P0301-138	GAUGE, Sight 18”
18	2	P0302-402	VALVE, Relief 5,000 Max
19	16	P0040-004	WASHER, Hardened Flat 1/4
20	4	P0001-04-008	BOLT, Hex 1/4 UNC x 2
21	8	P0003-04-000	NUT, Hex 1/4 UNC
22	2	P0301-142	GAUGE, 5000 PSI 2.5 7/16 MORB
23	6	P0003-03-000	NUT, Hex 6-32
24	6	P0017-06-750	SCREW, Round Machine 6/32 x .75
25	1	P0100-110	COUPLER, QD 3/8
26	1	P0100-099	COUPLER HALF, Female 1
27	1	P0100-103	COUPLER HALF, Female 3/4
28	1	P0100-111	NIPPLE, QD 1/2
29	1	P0100-100	NIPPLE HALF, Male 1
30	1	P0100-109	NIPPLE, QD 3/8
31	1	P0302-682	CHECK VALVE
32	1	A48326P	PLATE, Filter Port Cover
33	1	P0309-130	KIT, Seal
34	1	P0100-110A	PLUG, Aluminum
35	1	P0100-099A	PLUG, Aluminum
36	1	P0100-103A	PLUG, Aluminum Protective
37	1	P0100-111A	PLUG, Aluminum Protective
38	1	P0100-100A	PLUG, Aluminum Protective
39	1	P0100-109A	CAP, Aluminum
40	280 QT	P0126-001	OIL, Hydraulic Duraguard AW-46
41	2	P0300-319	FITTING, 16MFFOR-16MB
42	2	P0260-013	TRANSDUCER, Pressure
43	1	P0302-821	FITTING, 16 x 16 JIC Swivel Joint
44	3	P0302-819	FITTING, 8 x 8 JIC Swivel Joint
45	2	P0302-820	FITTING, 12 x 12 JIC Swivel Joint
46	2	P0309-180	FILTER, SS Tee (Includes item 46a)
46a	2	P0309-180a	ELEMENT
47	1	P0300-060	PLUG, 10MB-PLUG
48	4	P0300-460	ORING, 32FLOR
49	4	P0300-518	FLANGE, Code 61
50	1	P0300-311	FITTING, 04MFFOR-06MB90
51	1	P0300-386	FITTING, 06MFOR-06MB-06MFOR
52	2	P0300-310	FITTING, 04MFOR-06MB
53	3	P0300-371	FITTING, 16MFOR-16MB90
54	2	P0300-434	FITTING, 16MFOR-16MB45
55	1	P0300-446	FLANGE, 24SFO
56	1	A48133P	FITTING, Modified Plug
57	1	P0300-078	FITTING, 16MP-08FPS

(Continued on next page)

HYDRAULIC ASSEMBLY, A48343A

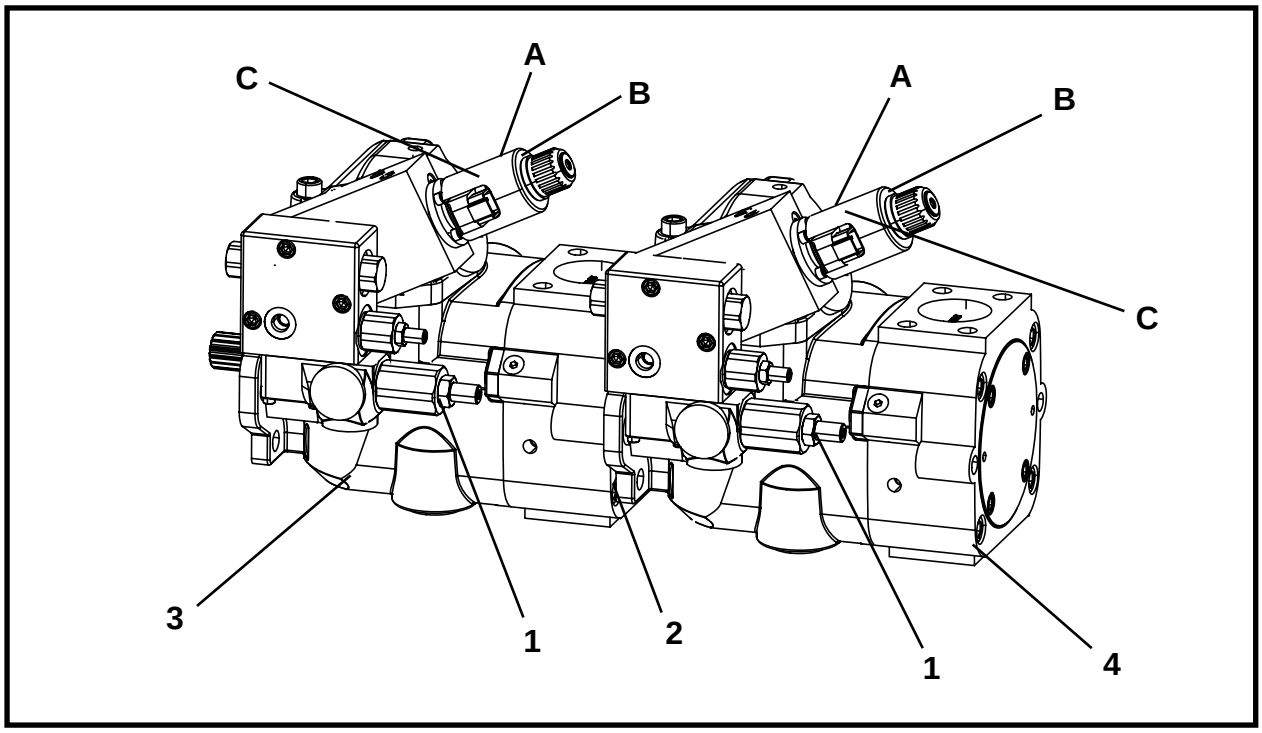


HYDRAULIC ASSEMBLY, A48343A

ITEM	QTY	PART NO.	DESCRIPTION
58	2	P0300-594	FITTING, 4FB-4MFFOR
59	1	P0300-537	FITTING, 16MB-16FB-16FB
60	2	P0300-528	FITTING, 06MB-04FP90
61	2	P0300-268	FITTING, 04MJ-04FP
62	2	P0300-421	FITTING, 20FLH6K-16MJ90
63	2	P0300-420	FLANGE, 20SFXO
64	2	P0300-878	FITTING, 04MB-04FB-04FB
65	2	P0300-427	FITTING, 04MFOR-04MB90
66	2	P0300-735	FITTING, 06MFFOR-04MB
67	1	P0300-382	FITTING, 08MFOR-08MP
68	1	P0300-305	FITTING, 08MFOR-08MB
69	1	P0300-441	FITTING, 16MJ-16MJ
70	1	P0300-438	FITTING, 08MJ-08MJ
71	2	P0300-440	FITTING, 12MJ-12MJ
72	2	P0300-439	FITTING, 08MJ-06MJ
73	2	P0300-454	FITTING, 08FJ-06MJ
74	1	A10428A-053	HOSE ASSEMBLY, 3/4 x 53
75	1	A10428A-046	HOSE ASSEMBLY, 3/4 x 46
76	1	A10314A-041	HOSE ASSEMBLY, 1/4 x 41
77	1	A10314A-030	HOSE ASSEMBLY, 1/4 x 30
78	1	A10337A-034	HOSE ASSEMBLY, 1/2 x 34
79	1	A10325A-063	HOSE ASSEMBLY, 1/4 x 63
80	1	A10325A-038	HOSE ASSEMBLY, 1/4 x 38
81	1	A10314A-016	HOSE ASSEMBLY, 1/4 x 16
82	1	A10371A-043	HOSE ASSEMBLY, 1/4 x 43
83	1	A10371A-046	HOSE ASSEMBLY, 1/4 x 46
84	2	A10342A-045	HOSE ASSEMBLY, 1 x 45
85	1	A09846A-045	HOSE ASSEMBLY, 1 x 45
86	1	A09870A-052	HOSE ASSEMBLY, 1 x 52
87	1	A10462A-600	HOSE ASSEMBLY, 1/2 x 600
88	1	A10451A-600	HOSE ASSEMBLY, 1 x 600
89	1	A09824A-600-R	HOSE ASSEMBLY, 3/4 x 600
90	1	A10463A-600-B	HOSE ASSEMBLY, 3/4 x 600
91	2	A09949A-600	HOSE ASSEMBLY, 3/8 x 600
92	1	P0300-953	FITTING, 16MFFOR-16MFFOR-16MFFOR-BKHD
93	1	P0300-631	FITTING, 16FFOR-08MFFOR
94	1	P0300-937	FITTING, 20MB-20FB-20FB
95	1	P0300-161	FITTING, 24MB-20FB
96	1	P0303-424	FLANGE, 4 Bolt Code 61
97	1	P0300-620	FITITNG, 20MFOR-20MB90
98	1	P0302-852	CHECK VALVE
99	2	A10342A-043	HOSE ASSEMBLY, 1 x 43
100	1	A10370A-056	HOSE ASSEMBLY, 1 x 56
101	1	A10359A-024	HOSE ASSEMBLY, 1/2 x 24
102	1	P0417-003	CAP, Pipe
103	1	A10080A-066	HOSE ASSEMBLY, 1/2 x 66
104	1	P0300-952	FITTING, 16MFFOR-16MFFOR-16MB
105	1	A40067P	FITTING, Temp Switch
106	1	A10312A-058	HOSE ASSEMBLY, 3/8 x 58
107*	1	A49339A	ASSEMBLY, Cooling Pump
108	4	P0001-04-003	BOLT, Hex 1/4 UNC x .75
109	3	A40045P	PIPE, PVC 1 x 3.38
110	3	P0258-092	ELBOW, PVC 1” 90°
111	1	P0302-810	CHECK VALVE
112	1	P0300-536	FITTING, 12MB-12FB-12FB
113	1	P0300-306	FITTING, 12MB-16FB
114	1	P0300-375	FITTING, 08MFOR-12MB
115	1	P0300-545	FITTING, 10MB-6FP

* Refer to this section for parts information.
QT - Quart

PUMP, P0303-372

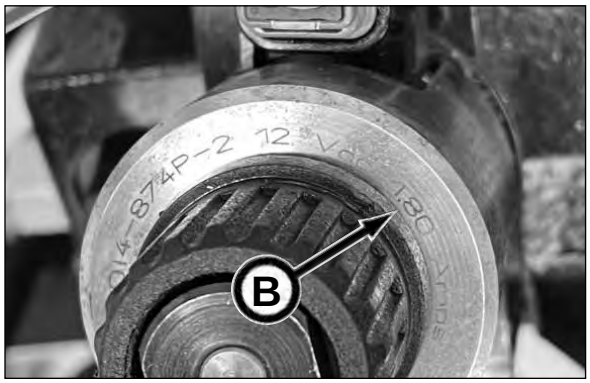


ITEM	QTY	PART NO.	DESCRIPTION
0	1	P0303-372	PUMP
1	2	P0303-372A	CONTROL, Load Sense
2	1	P0303-372B	KIT, Adapter, Viton
3*	1	P0303-372C	PUMP, Front (Jacking)
4*	1	P0303-372D	PUMP, Rear (Rotation)

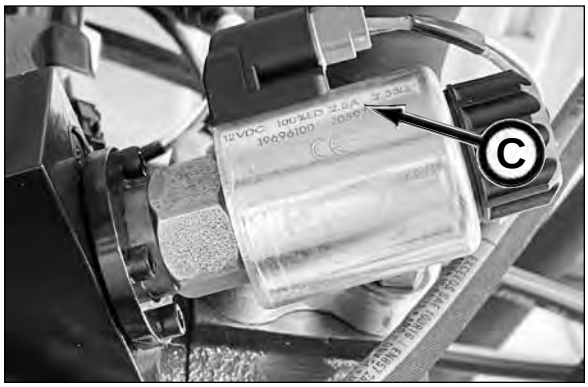
*** IMPORTANT:** If replacing a pump, the coil (A) on BOTH Jacking and Rotation pumps MUST have the identical amperage setting, otherwise improper operation will result.

Earlier pumps are equipped with the 1.8 amp coil. The coil ID is on the end of the coil (B). The 1.8 amp coil is obsolete. New pumps are equipped with the 2.5 amp coil. Therefore if the pump you are replacing has the 1.8 amp coil style, the remaining 1.8 amp coil pump will require a Coil Retrofit Kit (stem, spool and adapter) and the controller assembly software must be updated to the S10090A controller software. Contact your Akkerman Aftermarket Support representative for more information.

Later pumps are equipped with the 2.5 amp coil. The coil ID is on the side of the coil (C).

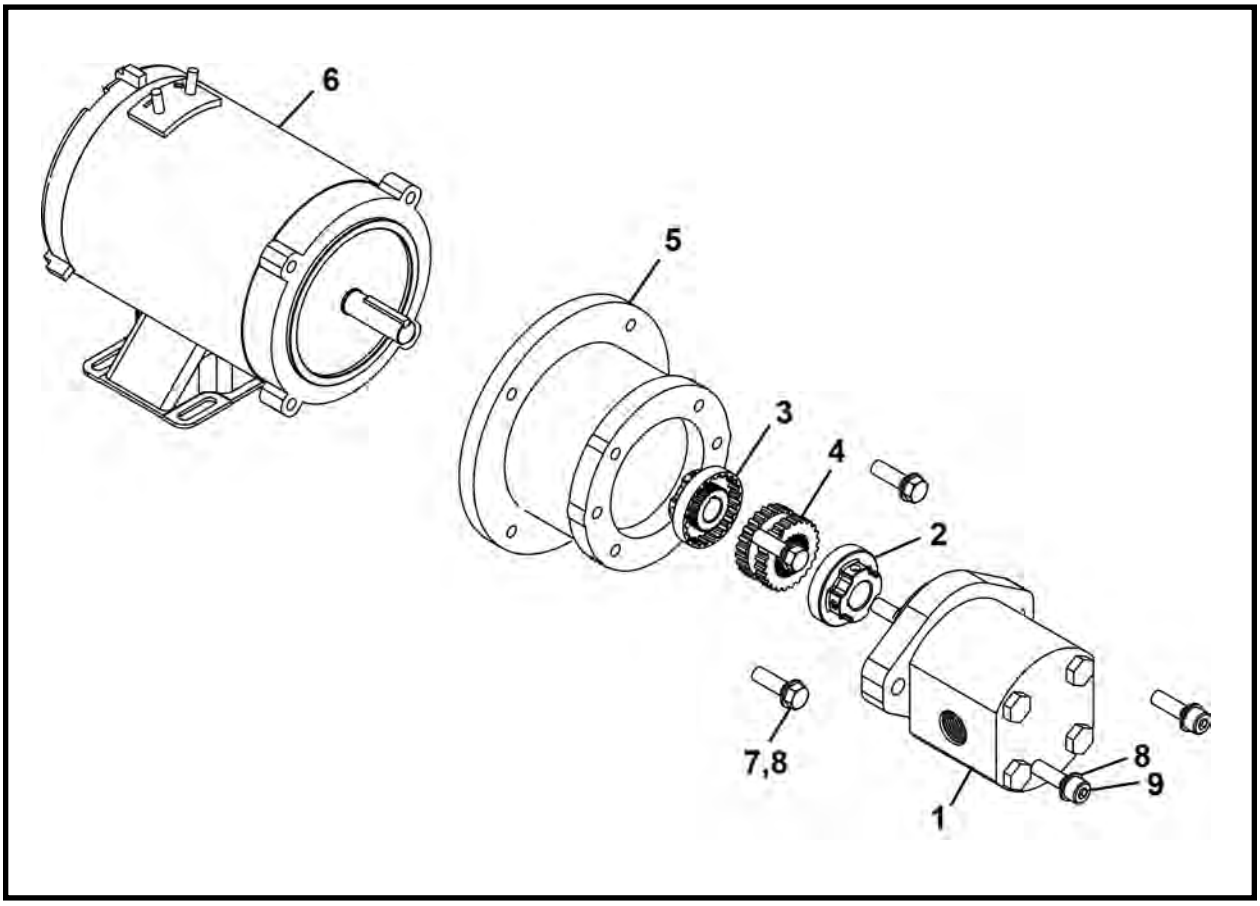


1.8 Amp Coil Stamping (B)



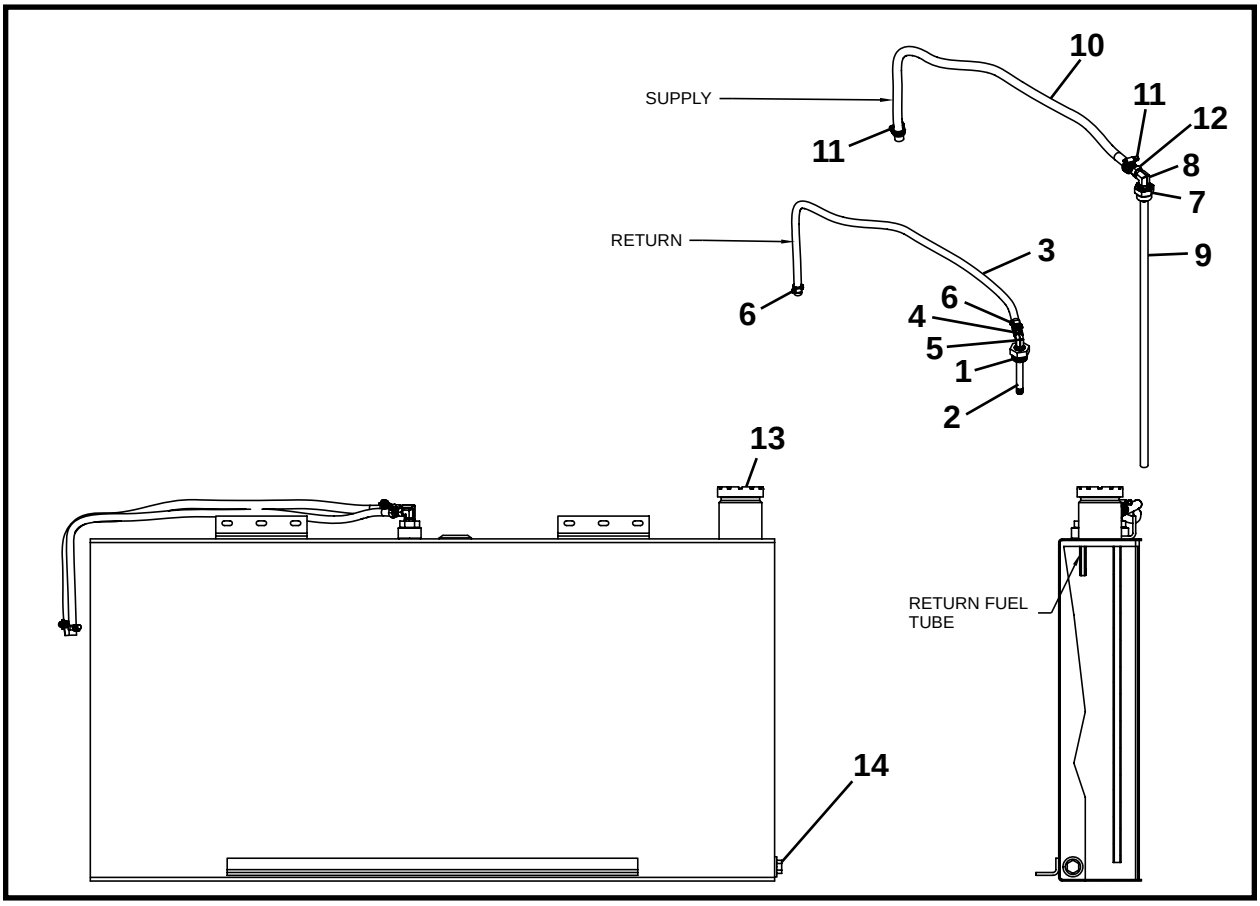
2.5 Amp Coil Stamping (C)

COOLING PUMP ASSEMBLY, A49339A



ITEM	QTY	PART NO.	DESCRIPTION
0	1	A49339A	COOLING PUMP ASSEMBLY
1	1	P0303-400	PUMP
2	1	P0305-266	COUPLING, Sleeve
3	1	P0305-265	COUPLING, Sleeve
4	1	P0305-267	SLEEVE
5	1	P0305-264	MOUNT, Motor
6	1	P0304-361	MOTOR, 1/4HP 12VDC
7	4	P0001-06-005	BOLT, Hex 3/8 UNC x 1.25
8	6	P0040-006	WASHER, Hardened Flat 3/8
9	2	P0031-06-005	SCREW, Socket Head Cap 3/8 UNC x 1.25

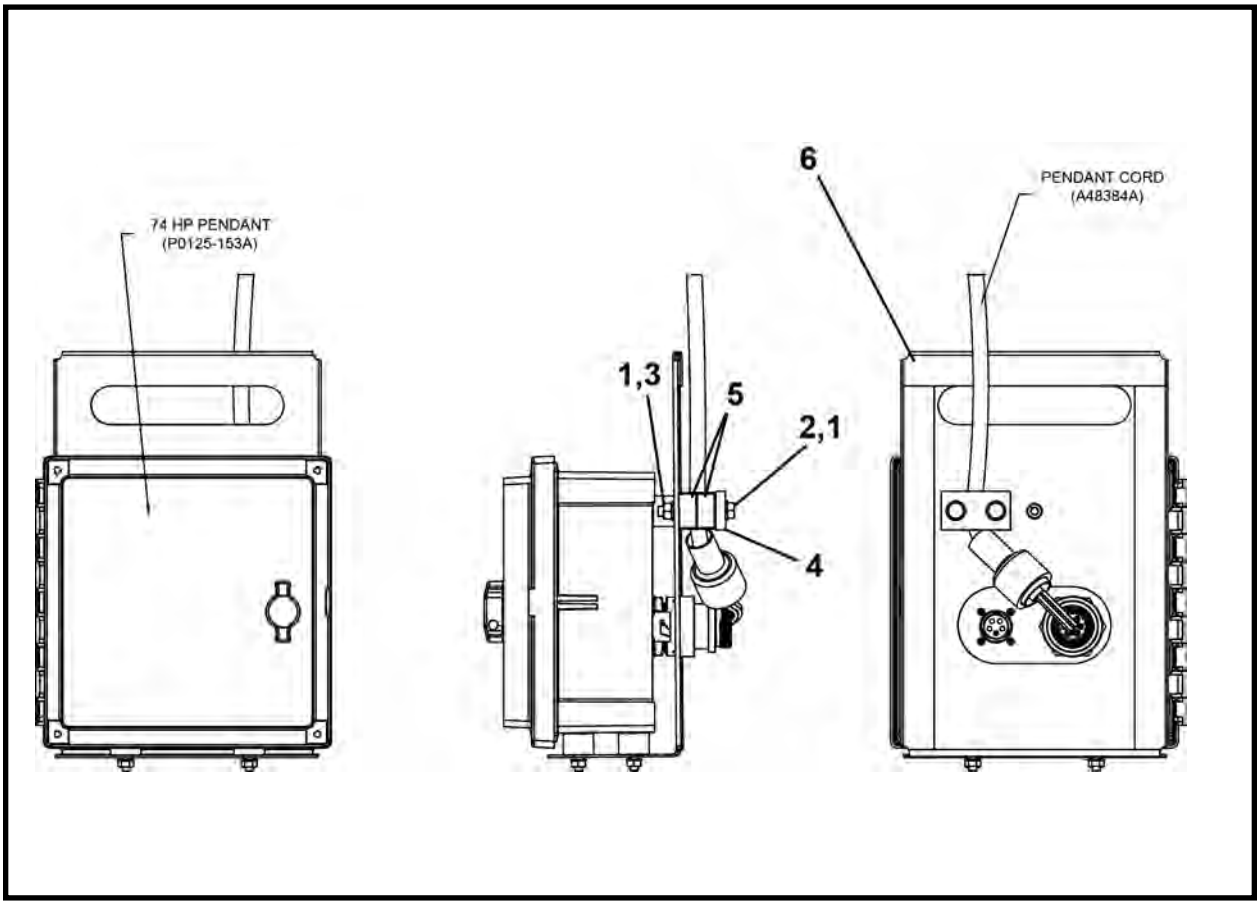
FUEL LINES ASSEMBLY, A48342A



ITEM	QTY	PART NO.	DESCRIPTION
0	1	A48342A	FUEL LINES ASSEMBLY
1	1	A42563P	FITTING, Fuel Tank
2	1	P0403-007	NIPPLE 1/4 x 4
3	155 LI	P0201-315	HOSE, Fuel 3/8 High Temp
4	1	P0300-875	FITTING, Hose
5	1	P0300-042	FITTING, 06MJ-06MB90
6	2	P0201-293	CLAMP, Radiator
7	1	A48329P	FITTING, Fuel Supply
8	1	P0300-877	FITTING, 8MJ-8MB90
9	1	A15417P	NIPPLE, 3/8
10	155 LI	P0201-314	HOSE, Fuel 1/2 High Temp
11	2	P0201-294	CLAMP, Radiator
12	1	P0300-876	FITTING
13	1	P0125-123	CAP, Diesel Fuel
14	1	P0300-060	PLUG

LI - Linear Inch

PENDANT HANGER ASSEMBLY, A48682A



ITEM	QTY	PART NO.	DESCRIPTION
0	1	A48682A	PENDANT HANGER ASSEMBLY
1	4	P0040-005	WASHER, Hardened Flat 5/16
2	2	P0001-05-009	BOLT, Hex 5/15 UNC x 2.25
3	2	P0013-05-000	NUT, Nylock 5/16 UNC
4	1	P0059-049B	PLATE, Cover
5	2	P0059-049A	CLAMP, Tube 5/8
6	1	A40010P	MOUNT, Pendant

NOTES

Numerical Index

CALIFORNIA
Proposition 65 Warning
Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.