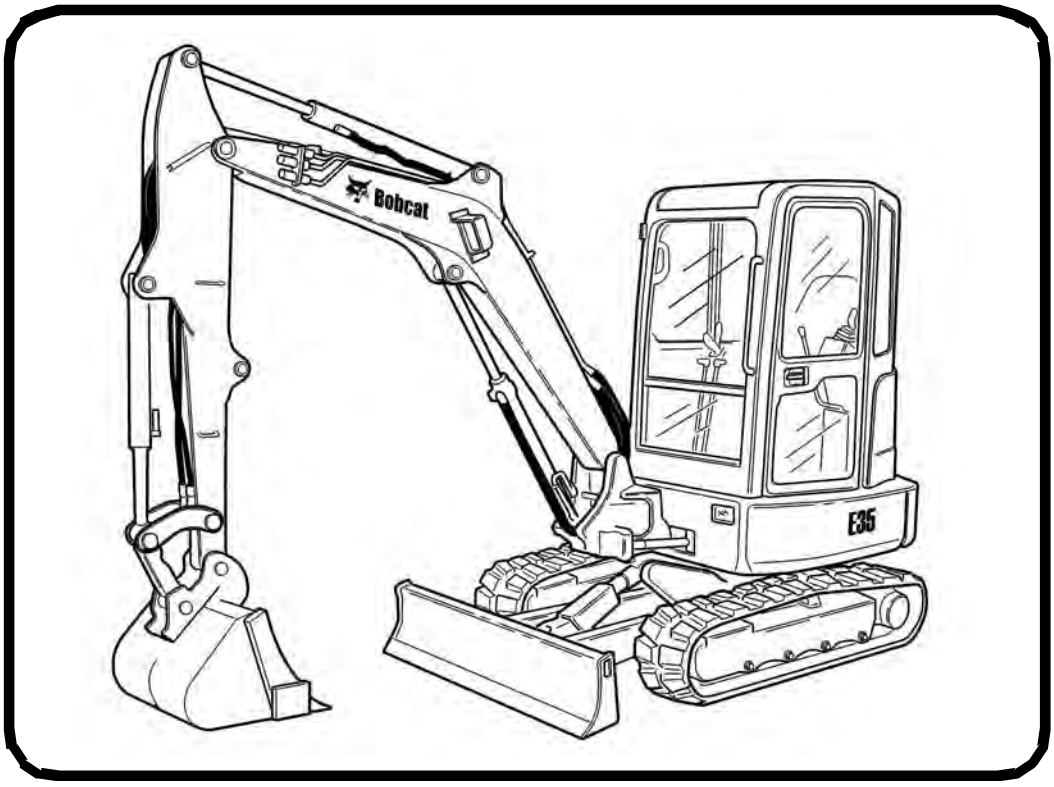
EN

Bobcat®

Operation & Maintenance Manual
E35 Compact Excavator

S/N AC2P11001 & Above



6987275-EN (1-11) Revised (2-12) (5)

Printed in Belgium
Original Instructions

BOBCAT COMPANY IS IS0 9001 CERTIFIED

ISO 9001 is an international standard that specifies requirements for a quality management system that controls the processes and procedures which we use to design, develop, manufacture and distribute Bobcat products.

British Standards Institute (**BSI**) is the Certified Registrar Bobcat Company chose to assess the Company's compliance with the ISO 9001 at Bobcat's manufacturing facilities in Gwinner and Bismarck, North Dakota (U.S.A.), Pontchateau (France), Dobris (Czech Republic) and the Bobcat corporate offices (Gwinner, Bismarck & West Fargo) in North Dakota. Only certified assessors, like BSI, can grant registrations.

ISO 9001 means that as a company we say what we do and do what we say. In other words, we have established procedures and policies, and we provide evidence that the procedures and policies are followed.

REGULAR MAINTENANCE ITEMS

	ENGINE OIL FILTER (6 Pack) 6675517		BATTERY 6670251
	FUEL FILTER 6667352		HYDRAULIC FILL / BREATHER CAP 6692836
 	AIR FILTER, Outer 6672467 AIR FILTER, Inner 6672468		RADIATOR CAP 6673313
	PRIMARY HYDRAULIC FILTER 6668819 CASE DRAIN HYDRAULIC FILTER 7009365		

NOTE: Always verify Part Numbers with your Bobcat dealer.

Avoid Silica Dust

Cutting or drilling concrete containing sand or rock containing quartz may result in exposure to silica dust. Use a respirator, water spray or other means to control dust.

FIRE PREVENTION

Maintenance

The machine and some attachments have components that are at high temperatures under normal operating conditions. The primary source of high temperatures is the engine and exhaust system. The electrical system, if damaged or incorrectly maintained, can be a source of arcs or sparks.

Flammable debris (leaves, straw, etc.) must be removed regularly. If flammable debris is allowed to accumulate, it can cause a fire hazard. Clean often to avoid this accumulation. Flammable debris in the engine compartment is a potential fire hazard.

The operator's area, engine compartment and engine cooling system must be inspected every day and cleaned if necessary to prevent fire hazards and overheating.

All fuels, most lubricants and some coolants mixtures are flammable. Flammable fluids that are leaking or spilled onto hot surfaces or onto electrical components can cause a fire.

Operation

Do not use the machine where exhaust, arcs, sparks or hot components can contact flammable material, explosive dust or gases.

Electrical

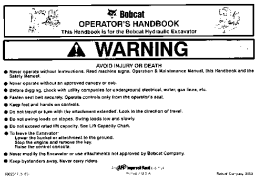
Check all electrical wiring and connections for damage. Keep the battery terminals clean and tight. Repair or replace any damaged part or wires that are loose or frayed.

Battery gas can explode and cause serious injury. Use the procedure in the Operation & Maintenance Manual for connecting the battery and for jump starting. Do not jump start or charge a frozen or damaged battery. Keep any open flames or sparks away from batteries. Do not smoke in battery charging area.

PUBLICATIONS AND TRAINING RESOURCES

The following publications are also available for your Bobcat Excavator. You can order them from your Bobcat dealer.

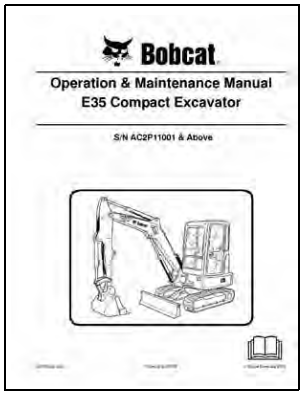
For the latest information on Bobcat products and the Bobcat Company, visit our web site at **www.bobcat.com**; you can also order Operator and Service Training materials online through **www.bobcatstore.com**



OPERATOR'S HANDBOOK

6987271

Gives basic operation instructions and safety warnings



OPERATION & MAINTENANCE MANUAL

6987275

- Complete instructions on the correct operation and the routine maintenance of the BOBCAT Excavator.

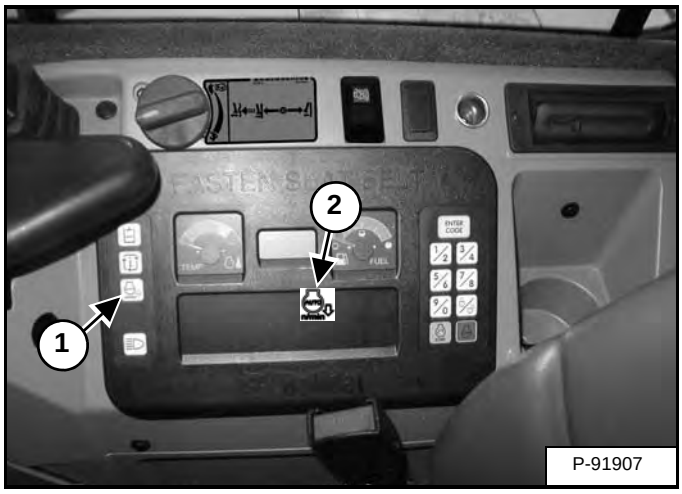
SERVICE MANUAL

6987276

- Complete maintenance instructions for your BOBCAT Excavator.

Auto Idle Feature

Figure 14



The auto idle feature (when engaged) will reduce the engine speed to low idle when the control levers (joystick, blade, travel, etc.) are in neutral and not used for approximately four seconds. The engine rpm will return to the set position as soon as any control lever is activated.

The automatic idle switch (Item 1) **[Figure 14]** is used to engage or disengage the automatic idle feature.

Press the switch (Item 1) once to engage automatic idle and the icon (Item 2) will illuminate. Press the switch (Item 1) a second time to disengage automatic idle, the icon (Item 2) **[Figure 14]** will be OFF.

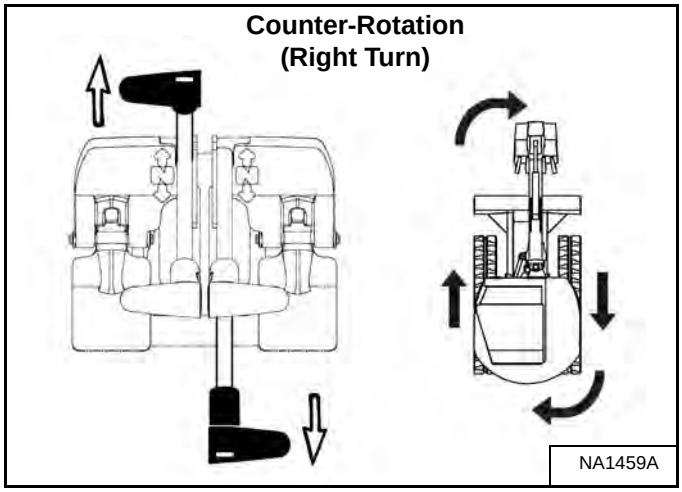
NOTE: Always disengage the auto idle feature when loading or unloading the excavator onto a transport vehicle.

TRAVEL CONTROLS (CONT'D)

Turning (Cont'd)

Counter-Rotation Right Turn

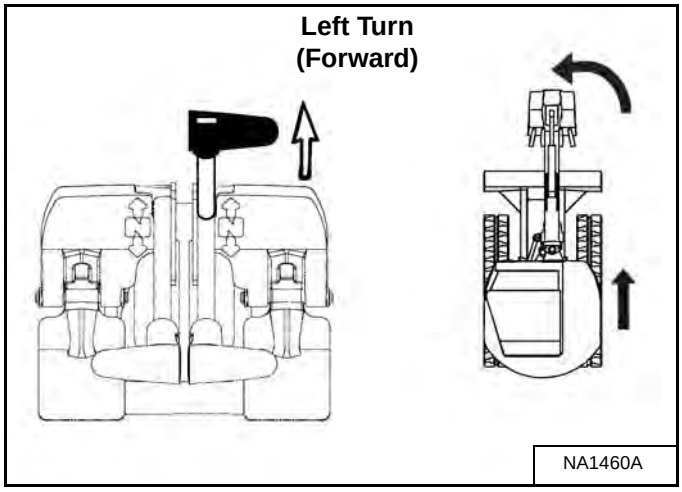
Figure 38



Push the left steering lever forward and pull the right steering lever backward **[Figure 38]**.

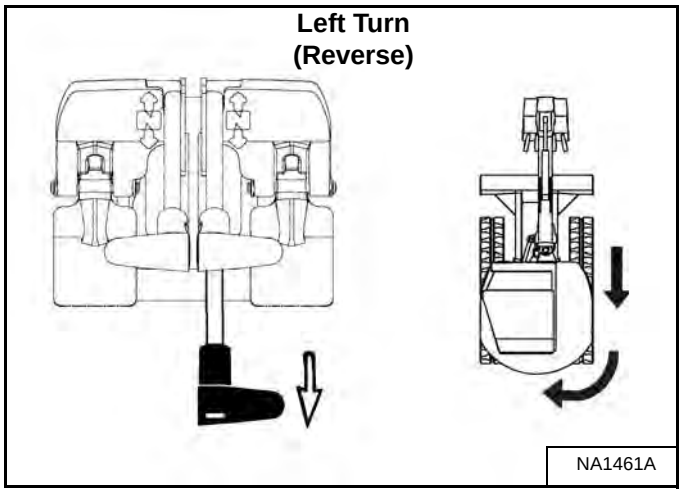
Left Turn

Figure 39



Push the right steering lever forward to turn left while travelling forward **[Figure 39]**.

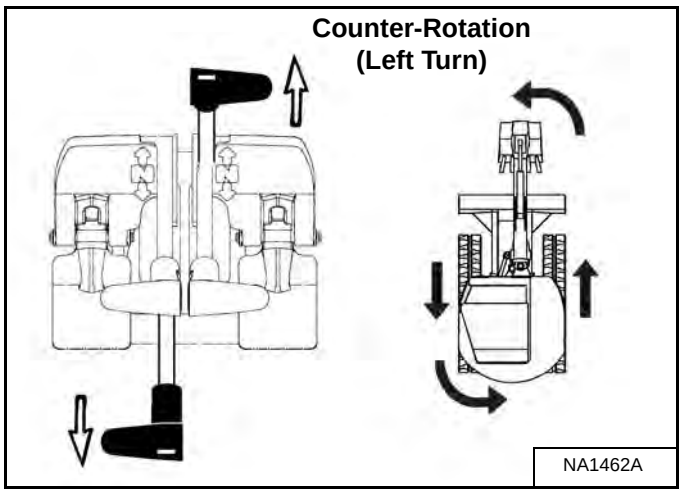
Figure 40



Pull the right steering lever backward to turn left while travelling backward **[Figure 40]**.

Counter-Rotation Left Turn

Figure 41

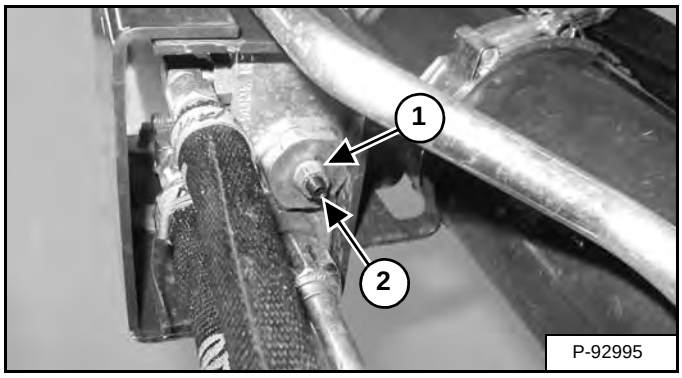


Push the right steering lever forward and pull the left steering lever backward **[Figure 41]**.

BOOM LOAD HOLDING VALVE (IF EQUIPPED) (CONT'D)

Lowering Boom With Load Holding Valve (Cont'd)

Figure 57



Lowering procedures:

With base end hose failure:

Loosen the jam nut (Item 1). Install a hex wrench into the valve screw (Item 2) **[Figure 57]** and slowly rotate the screw clockwise 1/8 to 1/4 turn and allow the boom to lower to the ground.

After the boom is fully lowered, rotate the screw anticlockwise (Item 2) 1/8 to 1/4 turn and tighten the lock nut (Item 1) **[Figure 57]**.

With rod end hose failure - with accumulator pressure:

Place a container under the valve and hose end to contain hydraulic fluid. Enter the excavator and turn the key to the ON position but do not start the engine. Slowly move the joystick boom lower function and allow the boom to lower to the ground.

With rod end hose failure and NO accumulator pressure:

Remove the boom base end hose from the boom load holding valve. Place a container under the valve and base end hose to contain hydraulic fluid.

Loosen the jam nut (Item 1). Install a hex wrench into the valve screw (Item 2) **[Figure 57]** and slowly rotate the screw clockwise 1/8 to 1/4 turn and allow the boom to lower to the ground.

After the boom is fully lowered, rotate the screw (Item 2) anticlockwise 1/8 to 1/4 turn and tighten the lock nut (Item 1) **[Figure 57]**. Reinstall the base end hose.

Loss of hydraulic pressure:

Use the same procedure as: **With rod end hose failure and NO accumulator pressure**.

Cold Temperature Starting Procedure (Cont'd)

Keyless

Follow STARTING PROCEDURE. (See Keyless on Page 67.)

If the preheat icon comes ON, wait for it to go off before pressing the START Button **[Figure 77 on Page 68]**.

The remaining preheat time (in seconds) will count down in the data display screen.

IMPORTANT

Do not engage the starter for longer than 15 seconds at a time. Longer use can damage the starter by overheating. Allow starter to cool for one minute before using starter again.

I-2034-0700

IMPORTANT

Machines warmed up with moderate engine speed and light load have longer life.

I-2015-0284

⚠ WARNING

AVOID INJURY OR DEATH

Do not use ether with glow plug (preheat) systems. Explosion can result which can cause injury, death, or severe engine damage.

W-2071-0907

Warming The Hydraulic System

IMPORTANT

When the temperature is below -30°C (-20°F), hydrostatic oil must be warmed before starting. The hydrostatic system will not get enough oil at low temperatures and will be damaged. Park the machine in an area where the temperature will be above -18°C (0°F) if possible.

I-2007-0910

Let the engine run at least 5 minutes to warm the engine and hydraulic fluid before operating the excavator.

Installing And Removing The Attachment (Pin-On X-Change)

Installation

NOTE: Installation and removal of the bucket is shown. The procedure is the same for other attachments. Disconnect any hydraulic lines that are operated by hydraulic power before removing any attachments (breaker, auger, etc.).

⚠ WARNING

AVOID INJURY OR DEATH

Never use attachments or buckets which are not approved by Bobcat Company. Buckets and attachments for safe loads of specified densities are approved for each model. Unapproved attachments can cause injury or death.

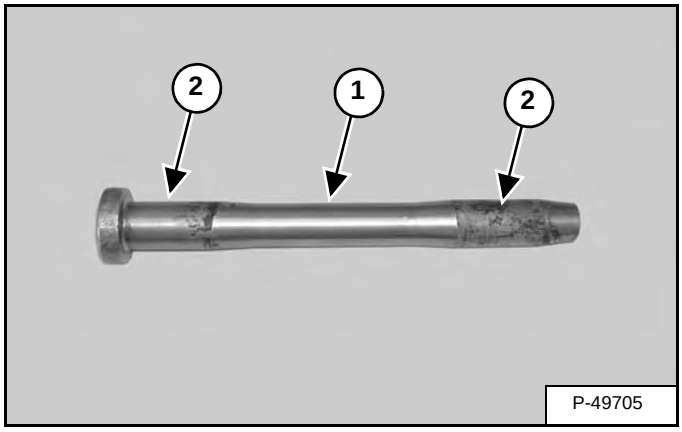
W-2052-0907

⚠ WARNING

Both hydraulic pins must be fully extended through the attachment mounting holes and locked with both retainer pins and clips. Failure to fully engage and lock hydraulic pins can allow attachment to come off and cause serious injury or death.

W-2507-0706

Figure 104



Inspect the pin (Item 1) **[Figure 104]** for wear or damage. Replace the pin as needed.

Apply a light coat of grease to the ends of the pin (Item 2) **[Figure 104]**.

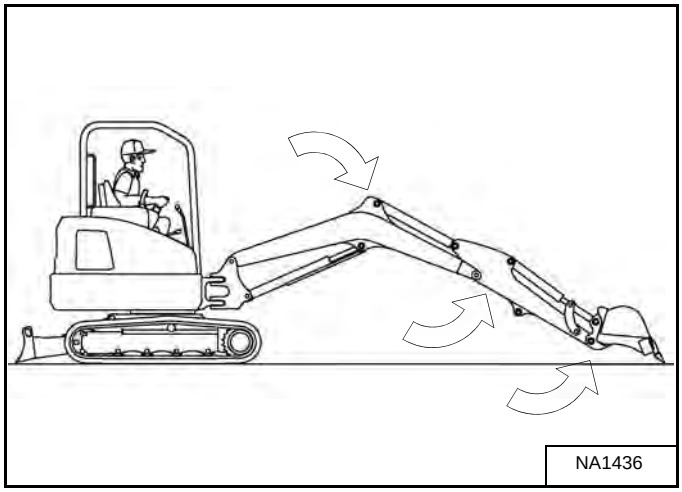
Figure 105

Start the engine and move the arm toward the bucket **[Figure 105]**.

Excavating

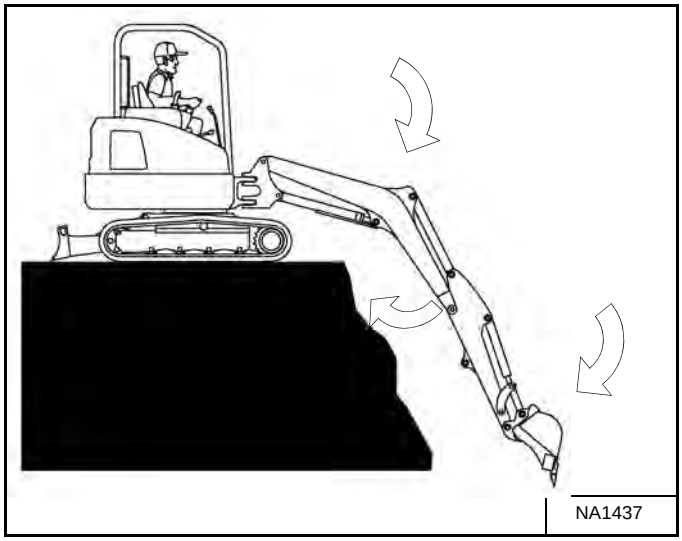
Lower the blade to increase digging performance.

Figure 121



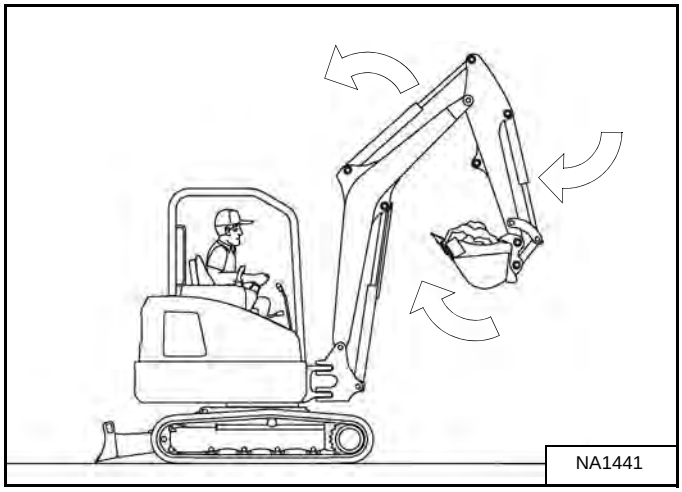
Extend the arm, lower the boom, and open the bucket **[Figure 121]**.

Figure 122



Retract the arm, while lowering boom and curling the bucket **[Figure 122]**.

Figure 123



Raise the boom, retract the arm and curl the bucket **[Figure 123]**.

Rotate the upperstructure.

NOTE: Do not allow the bucket teeth to contact the ground when swinging the upperstructure.

⚠ WARNING

Keep all bystanders 6 m (20 ft) away from equipment when operating. Contact with moving parts, a trench cave-in or flying objects can cause injury or death.

W-2119-0910

⚠ WARNING

AVOID INJURY OR DEATH

Check area to be excavated for overhead or underground electrical power lines. Keep a safe distance from electrical power lines.

LINE VOLTAGE	MINIMUM APPROACH DISTANCE
50 kV	At least 3 m (10 ft)
230 kV	At least 5 m (17 ft)
740 kV	At least 10 m (33 ft)

W-2757-0910

TRANSPORTING THE EXCAVATOR ON A TRAILER

Loading And Unloading

When transporting the machine, observe the rules, motor vehicle laws, and vehicle limit ordinances. Use a transport and towing vehicle of adequate length and capacity.

Secure the parking brakes and block the wheels of the transport vehicle.

Align the ramps with the centre of the transport vehicle. Secure the ramps to the truck bed and be sure ramp angle does not exceed 15 degrees.

Use metal loading ramps with a slip resistant surface.

Use ramps that are the correct length and width and can support the weight of the machine.

The rear of the trailer must be blocked or supported when loading or unloading the machine to prevent the front of the transport vehicle from raising.

Determine the direction of the track movement before moving the machine (blade forward).

Disengage the auto idle feature and move the two speed travel to the low range position.

Figure 146

Move the machine forward onto the transport vehicle **[Figure 146]**.

Do not change direction of the machine while it is on the ramps.

Lower the boom, arm, bucket, and blade to the transport vehicle.

Stop the engine and remove the key (if equipped).

Put blocks at the front and rear of the tracks.

SEAT BELT

Inspection And Maintenance

WARNING

Failure to properly inspect and maintain the seat belt can cause lack of operator restraint resulting in serious injury or death.

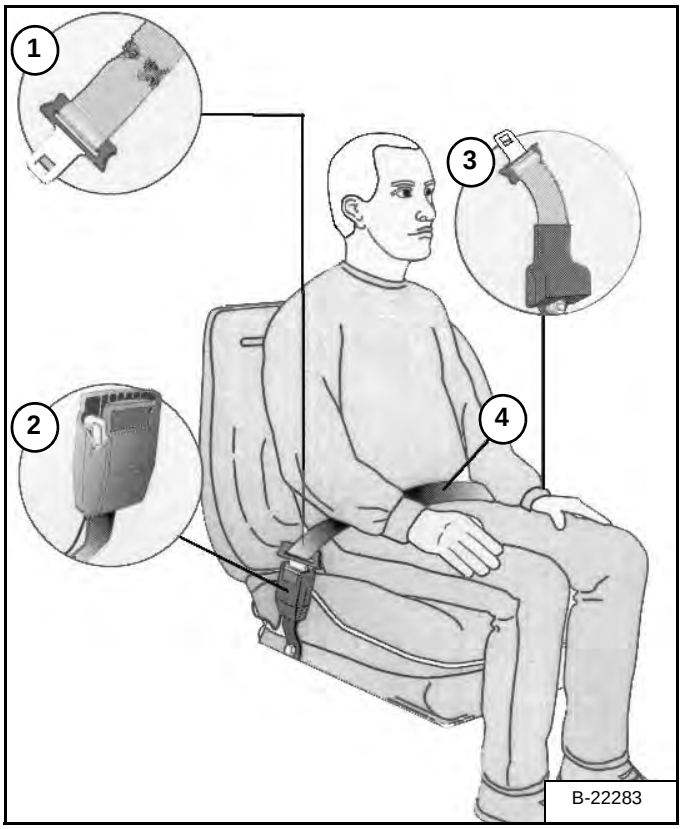
W-2466-0703

Check the seat belt daily for correct function.

Inspect the seat belt system thoroughly at least once each year or more often if the machine is exposed to severe environmental conditions or applications.

Any seat belt system that shows cuts, fraying, extreme or unusual wear, significant discolourations due to ultraviolet UV exposure, dusty / dirty conditions, abrasion to the seat belt webbing, or damage to the buckle, latch plate, retractor (if equipped), hardware or any other obvious problem should be replaced immediately.

Figure 151



The items below are referenced in **[Figure 151]**.

1. Check the webbing. If the system is equipped with a retractor, pull the webbing completely out and inspect the full length of the webbing. Look for cuts, wear, fraying, dirt and stiffness.

2. Check the buckle and latch for correct operation. Make sure latch plate is not excessively worn, deformed or buckle is not damaged or casing broken.

3. Check the retractor web storage device (if equipped) by extending webbing to determine if it looks correct and that it spools out and retracts webbing correctly.

4. Check webbing in areas exposed to ultraviolet (UV) rays from the sun or extreme dust or dirt. If the original colour of the webbing in these areas is extremely faded and / or the webbing is packed with dirt, the webbing strength may have deteriorated.

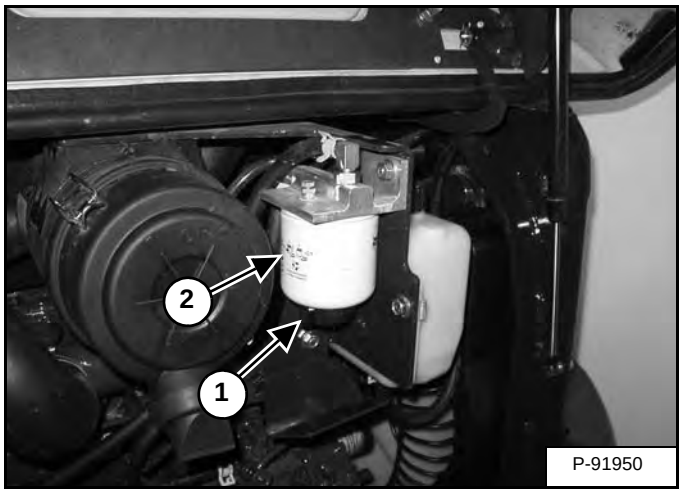
See your Bobcat dealer for seat belt system replacement parts for your machine.

Fuel Filters

Removing Water

Open the tailgate. (See TAILGATE on Page 112.)

Figure 171



Loosen the drain (Item 1) **[Figure 171]** at the bottom of the filter to drain water from the filter into a container.

Clean up any spilled fuel.

Replacing Elements

Remove the filter (Item 2) **[Figure 171]**.

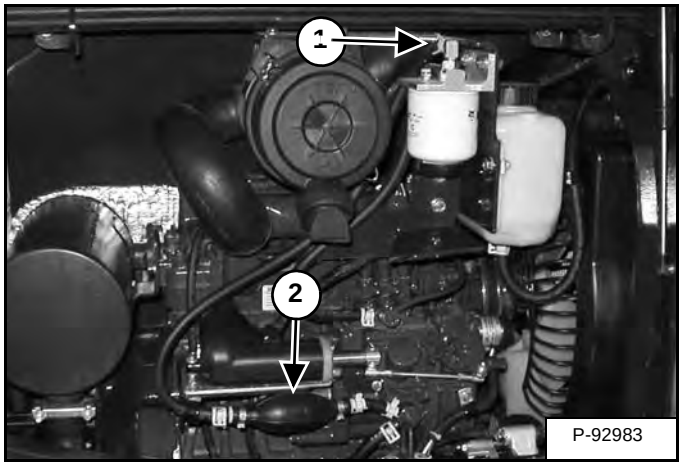
Clean the area around the filter housing. Put clean oil on the seal of the new filter. Install the fuel filter and hand tighten.

Remove the air from the fuel system. (See Removing Air From The Fuel System on Page 120.)

Draining The Fuel Tank

See the SERVICE SCHEDULE for the correct service interval. (See SERVICE SCHEDULE on Page 107.)

Figure 172



Remove the hose (Item 1) **[Figure 172]** from the fuel filter. Route the hose to a container.

Squeeze the hand pump (priming bulb) (Item 2) **[Figure 172]** to start the fuel siphoning from the fuel tank.

Drain the fuel into the container.

Reuse, recycle or dispose of fuel in an environmentally safe manner.

Reinstall the hose (Item 1) **[Figure 172]** after the fuel is removed from fuel tank.

⚠ WARNING

AVOID INJURY OR DEATH

Diesel fuel or hydraulic fluid under pressure can penetrate skin or eyes, causing serious injury or death. Fluid leaks under pressure may not be visible. Use a piece of cardboard or wood to find leaks. Do not use your bare hand. Wear safety goggles. If fluid enters skin or eyes, get immediate medical attention from a doctor familiar with this injury.

W-2072-EN-0909

Using A Booster Battery (Jump Starting)

IMPORTANT

If jump starting the excavator from a second machine:

When jump starting the excavator from a battery installed in a second machine, make sure the engine is NOT running while using the glow plugs. High voltage spikes from a running machine can burn out the glow plugs.

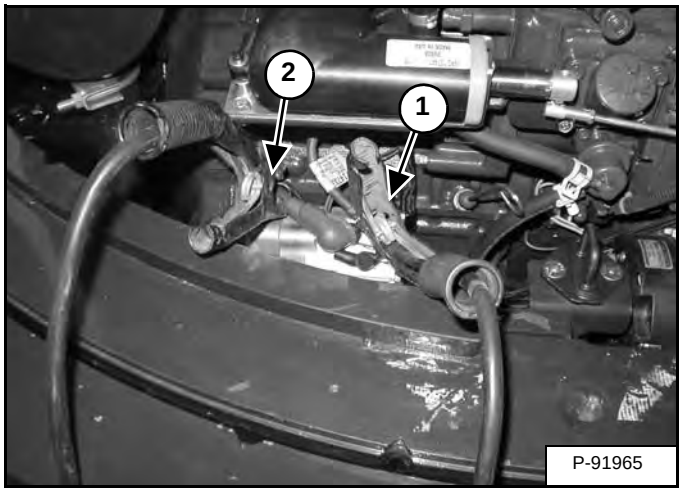
I-2060-0906

If it is necessary to use a booster battery to start the engine, BE CAREFUL! There must be one person in the operator's seat and one person to connect and disconnect the battery cables.

Be sure the key switch is OFF. The booster battery must be 12 volt.

Open the tailgate. (See TAILGATE on Page 112.)

Figure 192



Connect one end of the first cable to the positive (+) terminal of the booster battery. Connect the other end of the same cable to the positive (+) terminal (Item 1) **[Figure 192]** of the excavator starter.

Connect one end of the second cable to the negative (-) terminal of the booster battery. Connect the other end of the same cable to the starter mounting bolt (Item 2) **[Figure 192]**.

Start the engine. After the engine has started, remove the ground (-) cable first (Item 2) **[Figure 192]**.

Disconnect the cable from the excavator starter (Item 1) **[Figure 192]**.

NOTE: (See Cold Temperature Starting on Page 68.)

IMPORTANT

Damage to the alternator can occur if:

- **Engine is operated with battery cables disconnected.**
- **Battery cables are connected when using a fast charger or when welding on the excavator. (Remove both cables from the battery.)**
- **Extra battery cables (booster cables) are connected wrong.**

I-2223-0903

⚠ WARNING

AVOID INJURY OR DEATH

Batteries contain acid which burns eyes and skin on contact. Wear goggles, protective clothing and rubber gloves to keep acid off body.

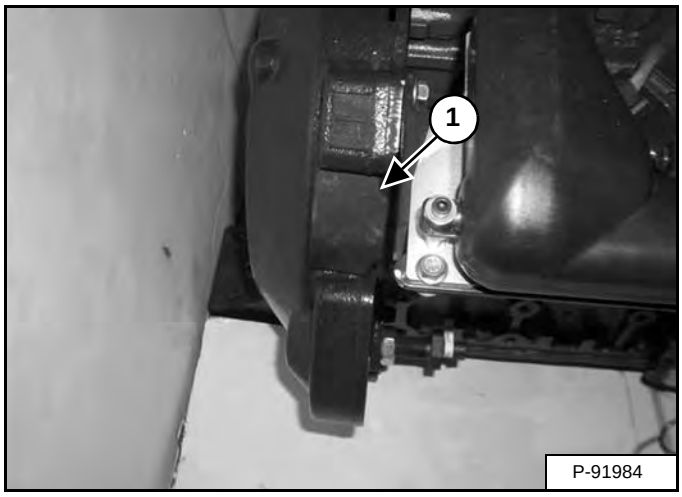
In case of acid contact, wash immediately with water. In case of eye contact get prompt medical attention and wash eye with clean, cool water for at least 15 minutes.

If electrolyte is taken internally drink large quantities of water or milk! DO NOT induce vomiting. Get prompt medical attention.

W-2065-0807

Belt Replacement (Cont'd)

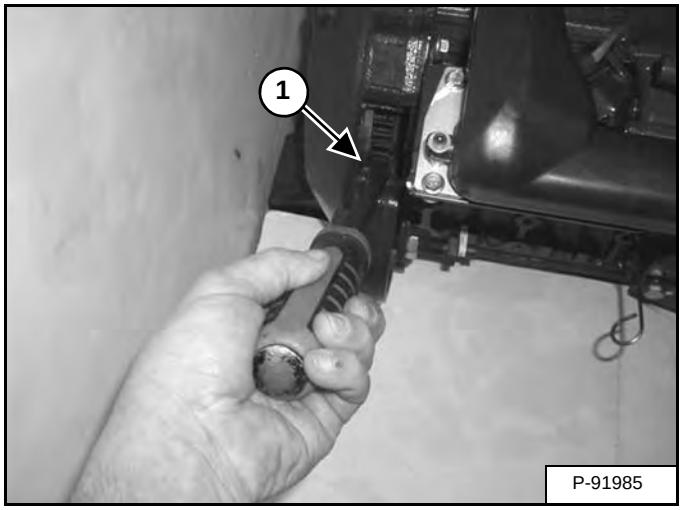
Figure 216



NOTE: The engine is removed from the machine for photo clarity only. This procedure can be performed with engine installed in machine.

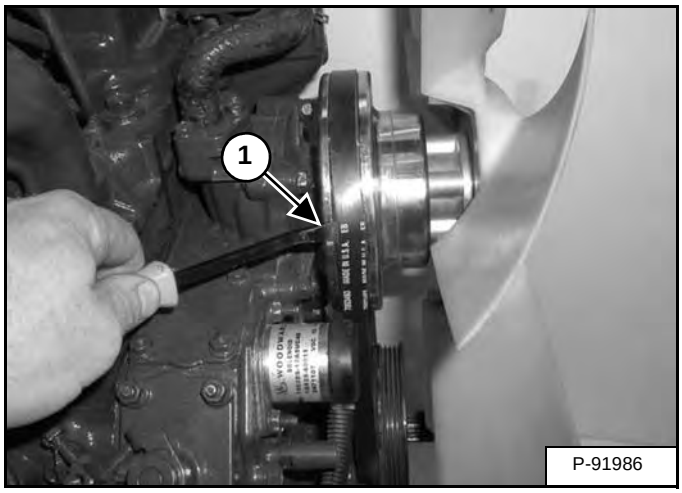
The engine will need to be rotated by hand to remove the belt. To access the flywheel, remove the plug (Item 1) **[Figure 216]** from the flywheel housing.

Figure 217



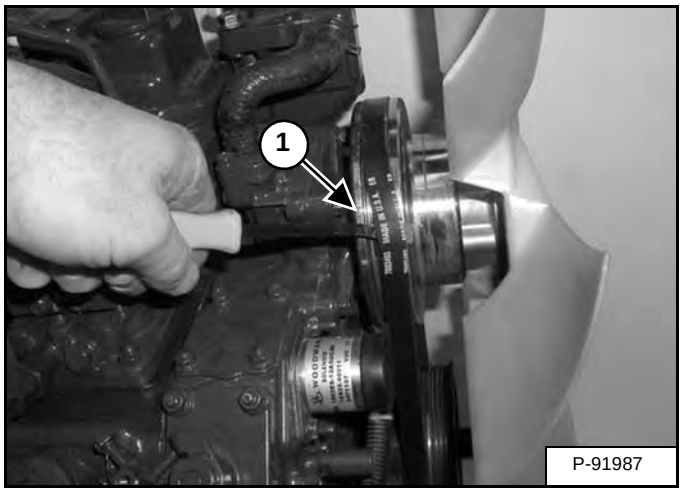
Install a pry bar (Item 1) **[Figure 217]** to the flywheel teeth.

Figure 218



Install a second pry bar (Item 1) **[Figure 218]** or flat blade screw driver between the belt and the water pump pulley.

Figure 219



Using the pry bar (Item 1) **[Figure 217]** to rotate the engine, start to push the belt off of the pulley using the second pry bar (Item 1) **[Figure 219]**.

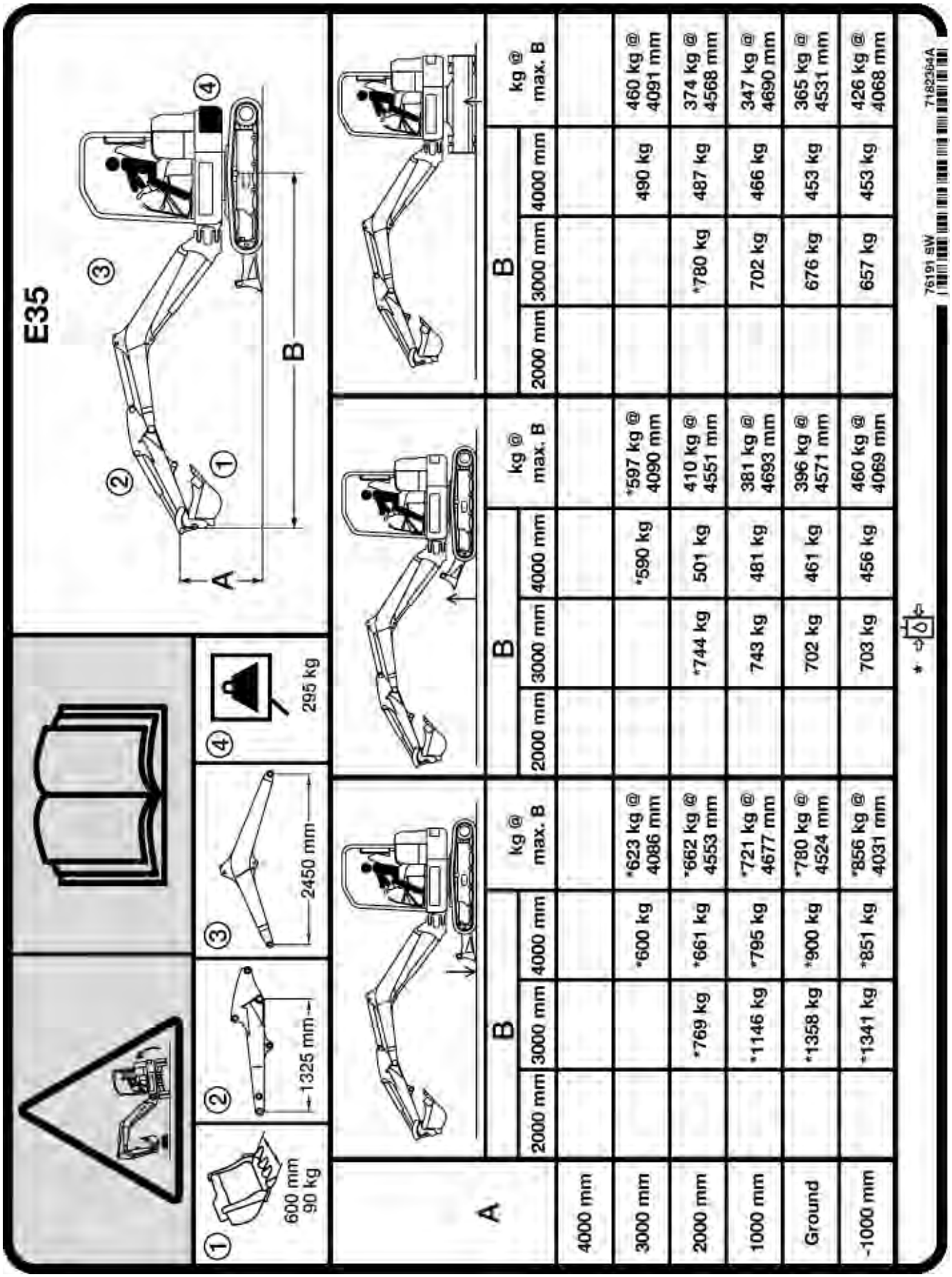
Continue to manually rotate the engine until the belt is off the pulley.

DIAGNOSTIC SERVICE CODES

Number Codes List

CODE		CODE	
C0216	Hydraulic charge filter not connected	C2005	Two speed solenoid error ON
C0217	Hydraulic charge filter plugged	C2006	Two speed solenoid error OFF
C0309	Battery voltage low	C2102	Glow plugs error ON
C0310	Battery voltage high	C2103	Glow plugs error OFF
C0311	Battery voltage extremely high		
C0314	Battery voltage extremely low	C2202	Starter error ON
C0315	Battery voltage shutdown level	C2203	Starter error OFF
C0322	Battery voltage out of range low		
		C2305	Offset base solenoid short to battery
C0414	Oil pressure extremely low	C2306	Offset base solenoid short to ground
C0415	Oil pressure shutdown level	C2307	Offset base solenoid open circuit
C0610	Engine speed high	C2405	Offset rod solenoid short to battery
C0611	Engine speed extremely high	C2406	Offset rod solenoid short to ground
C0613	Engine speed no signal	C2407	Offset rod solenoid open circuit
C0615	Engine speed shutdown level		
C0618	Engine speed out of range high	C2505	Offset return short to battery
		C2506	Offset return short to ground
C0710	Hydraulic oil temperature high	C2507	Offset return open circuit
C0711	Hydraulic oil temperature extremely high		
C0715	Hydraulic oil temperature shutdown level	C2605	Auxiliary base solenoid short to battery
C0721	Hydraulic oil temperature out of range high	C2606	Auxiliary base solenoid short to ground
C0722	Hydraulic oil temperature out of range low	C2607	Auxiliary base solenoid open circuit
C0810	Engine coolant temperature high	C2705	Auxiliary rod solenoid short to battery
C0811	Engine coolant temperature extremely high	C2706	Auxiliary rod solenoid short to ground
C0815	Engine coolant temperature shutdown level	C2707	Auxiliary rod solenoid open circuit
C0821	Engine coolant temperature out of range high		
C0822	Engine coolant temperature out of range low	C2805	Hydraulic exchange error ON
		C2806	Hydraulic exchange error OFF
C0921	Fuel level out of range high		
C0922	Fuel level out of range low	C3028	Controller memory failure (Log only)
C1221	Front auxiliary control out of range high	C3128	Interrupted power failure (Log only)
C1222	Front auxiliary control out of range low		
C1223	Front auxiliary control not in neutral	C3323	Main controller not programmed
C1305	Fuel shut-off hold solenoid short to battery	C3397	Main controller programmed (Log only)
C1306	Fuel shut-off hold solenoid short to ground		
C1307	Fuel shut-off hold solenoid open circuit		
C1402	Fuel shut-off hold solenoid short error on		
C1403	Fuel shut-off hold solenoid short error off		

Rated Lift Capacity - Standard Arm W/Counterweight



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