1350RT
1350RT (EU)
1350RT X-Series

Compact Track Loader

Operator's Manual

50950468 Rev. G 05/21

Original Instructions

TABLE OF CONTENTS

List of Attachments

Dirt / Construction Buckets	*Weight*	*Rated Operating Capacity @ 35%*
1524 mm/0.31 m³ (60 in./11.0 ft³)	138 kg (305 lbs)	612 kg (1350 lbs)
1549 mm/0.33 m³ (61 in./11.6 ft³)	141 kg (310 lbs)	600 kg (1323 lbs)
Pallet Forks	Weight	Rated Operating Capacity
406.4 mm (16 in.) Forks with Backrest Rating per EN474-3	213 kg (470 lbs)	420 kg (925 lbs)
508 mm (20 in.) Forks with Backrest Rating per EN474-3	213 kg (470 lbs)	386 kg (850 lbs)
609.6 mm (24 in.) Forks with Backrest Rating per SAE J1197	213 kg (470 lbs)	363 kg (800 lbs)

Table 2 - List of Attachments

NOTE: *The attachments determine how the machine is used.*

⚠ WARNING

Contact Edge Attachments (http://www.edgeattach.com/) for information about available attachments approved for use with the machine.

Use of unapproved attachments could result in serious injury or property damage.

Contact Edge Attachments (http://www.edgeattach.com/) before using attachments or equipment not approved by Manitou Americas. Use of non-approved attachments or unauthorized modifications is prohibited.

Using Attachments

Read all documentation provided with attachments to learn how to safely operate and maintain them.

Do not use the machine for any applications or purposes other than those described in this manual or manuals supplied with attachments. Contact your dealer before using attachments or equipment not approved by Manitou Group. Use of non-approved attachments or unauthorized modifications is prohibited.

Vibration Information

Compact construction equipment is generally used in harsh environments. This type of usage can expose an operator to uncomfortable levels of vibration. It is useful to understand exposure to vibration levels when operating compact equipment and what can be done to reduce vibration exposure. As a result, equipment operation can be more efficient, productive and safe.

An operator's exposure to vibration occurs in two ways:

- Whole-Body Vibration (WBV)
- Hand-Arm Vibration (HAV)

WBV issues are primarily addressed in this manual, because evaluations have shown that operation of mobile compact construction equipment on work sites typically results in HAV levels less than the allowed exposure limit of 2.5 m/s^2. Member States of the European Union must comply with the Physical Agents (vibration) Directive, 2002/44/EC.

Effective control of vibration exposure for an operator involves more than just vibration levels on the machine. The work site, how the machine is used, and proper training all play important roles in reducing vibration exposure.

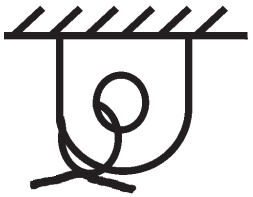
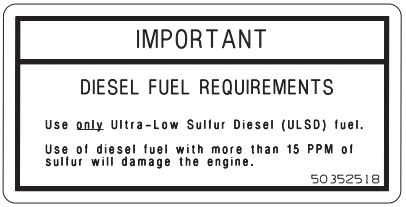
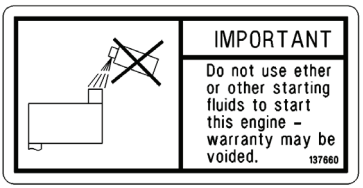
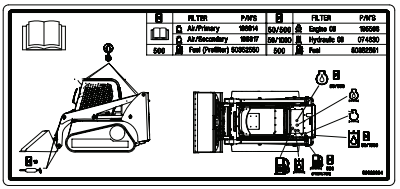
Vibration exposure results from:

and close to the ground can be difficult to see from the cab.

- Always look in the direction of travel, including reverse. A back-up alarm is not a substitute for looking behind you when operating the machine in reverse.
- Keep bystanders out of and away from the work area.
- Keep the lift arm as low as possible while traveling. See "Lift Arm Travel Position" on page 90.

- Control the machine cautiously until fully familiar with all the controls and handling.
- Carry the load low. Move the controls smoothly and gradually, and operate at speeds appropriate for the conditions.
- New operators must learn to operate the machine in an open area away from bystanders. Practice with the controls until the machine can be operated safely and efficiently.
- Do not overload the machine. See "Payloads/Capacities" on page 41 for load limits. Be aware that effective operating capacity is reduced when the machine is turned.
- Do not raise or drop a loaded bucket or attachment suddenly. Abrupt movements under load can cause serious instability.
- DO NOT ram the lift cylinder to the end of the stroke. The resulting jolt could spill the load.
- Do not use the machine to lift or transport people. Never carry riders. Do not allow others to ride on the machine or attachments, because they could fall or cause an accident.
- Never leave the operator's seat without lowering the lift arm/attachment flat on the ground or engaging the lift arm support device(s), and then stopping the engine and removing the ignition key.
- Stop the engine and place the controls in the lock-out position before mounting attachments. Check that attachments are securely fastened to the lift arm before working.
- Be aware that attachments affect the handling and balance of the machine. Adjust the operation of the machine as necessary when using attachments.
- Before coupling or uncoupling the hydraulic lines for the attachment, stop the engine and press the auxiliary hydraulics pressure relief switch to relieve pressure in the auxiliary hydraulics circuit.
- Make sure the bucket is lowered to the ground before activating the lift arm float. Never activate the float function with the bucket or attachment raised, because this will cause the lift arm and bucket or attachment to drop suddenly.
- Be aware of overhead obstacles. Any object near the lift arm could represent a potential hazard, or cause the operator to react suddenly and cause an accident. Use a spotter or signal person when working near bridges, phone lines, work site scaffolds, or other obstructions.
- Do not place limbs near moving parts. Severing of body parts can result.
- Exhaust fumes can kill. Do not operate the machine in an enclosed area without adequate ventilation. Internal combustion engines deplete the oxygen supply within enclosed spaces and may create a serious hazard unless the oxygen is replaced.
- Operators should be aware of any open windows, doors or duct work into which exhaust gases may be carried, exposing others to danger.
- Never allow anyone under a raised lift arm. Lowering the lift arm or a falling load can result in death or serious personal injury.
- Avoid slowing suddenly while carrying a load. Sudden slowing can cause the load

Common Decals

REF.	DECAL	INFORMATION
A		Located next to the fuel filler neck USE PROPER DIESEL FUEL ONLY!
B		Located on the bottom of the side panels behind the tracks (both sides), and at the front of each pontoon on the outside face (both sides) Tie-down point. Only use tie-down points indicated on machine when transporting machine.
C		Located near the fuel filler neck IMPORTANT: DIESEL FUEL REQUIREMENTS Use only Ultra-Low Sulfur Diesel (ULSD) fuel Use of diesel fuel with more than 15 PPM of sulfur will damage the engine.
D		Located near the hydraulic fluid reservoir filler neck USE PROPER HYDRAULIC FLUID ONLY!
E		Located inside the engine compartment IMPORTANT Do not use ether or other starting fluids to start this engine — warranty may be voided.
F		Located on the inside of the left lift arm pillar. Service Decal

Q	Departure Angle (w/o Counterweight)	26°
R	Ground Clearance	213 mm (8.4 in)
S	Track Gauge	1148 mm (45.2 in)
T	Track Shoe Width	300 mm (11.8 in)
U	Crawler Base	1168 mm (46.0 in)
V	Overall Width (w/o Bucket)	1448 mm (57.0 in)
W	Bucket Width	1524 mm (60.0 in)
X	Clearance Radius – Front (with Bucket)	1918 mm (75.5 in)
Y	Clearance Radius – Front (w/o Bucket)	1171 mm (46.1 in)
Z	Clearance Radius – Rear (w/o Counterweight)	1440 mm (56.7 in)

Payloads/Capacities

NOTE: *Pallet fork load center is the distance from the front face of the forks to the center of mass of the load.*

Table 5 - Payloads and Capacities

Dirt / Construction Buckets	Weight	Rated Operating Capacity @ 35%
1524 mm/0.31 cu. m. (60 in/11.0 cu. ft.)	138 kg (305 lbs)	612 kg (1350 lbs)
1549 mm/0.33 cu. m. (61 in/11.6 cu. ft.)	141 kg (310 lbs)	600 kg (1323 lbs)
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609.6 mm (24.00 in) Forks with Backrest Rating per SAE J1197	213 kg (470 lbs)	363 kg (800 lbs.)

1. Measured on firm and level ground. Equipped with full fluids and 84 kg (185 lbs.) operator.

Weights

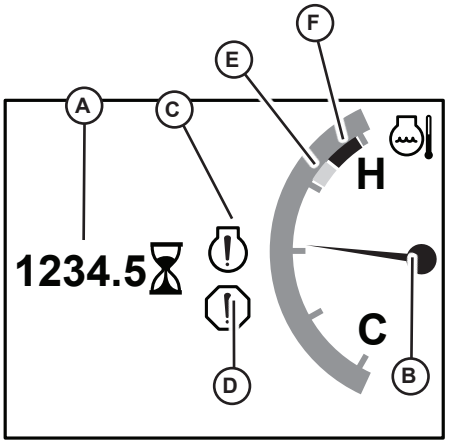
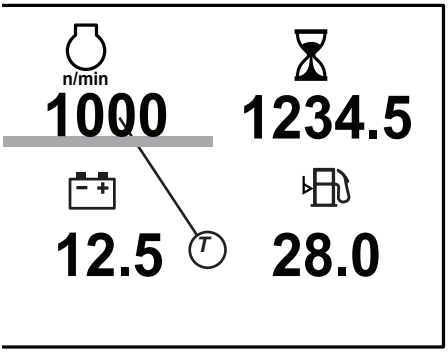
Table 6 - Weights

	1350RT
Operating Mass[1]	2953 kg (6510 lbs.)
Maximum Permissible Weight[3]	3565 kg (7859 lbs.)

Information Center Electronic Display Screens

NOTE: *Values may not display for all parameters, depending upon installed options and equipment.*

Table 16 - Status, Maintenance and Error Code Screens

Display Mode	Description
	Dual Gauge Display Accumulated operation time. *Time is displayed in hours, and accumulates when the engine is running.* Engine coolant temperature. Amber error condition warning. Causes DM1/DM2 errors screen(s) to display. See page 64. Red critical error warning. Causes DM1/DM2 errors screen(s) to display. See page 64. Engine coolant temperature amber warning region. Indicates elevated coolant temperature. Engine coolant temperature red stop warning region. Indicates serious coolant overheating condition. Running the engine in an overheated condition can damage the engine.
	Quad Gauge Display Displays four different status parameters simultaneously. To change the displayed parameters, press and hold the ok button (N,) until orange bar (T) displays. Press the left/right side of navigation rocker button (M,) to select the parameter and press the top/bottom of navigation rocker button to change the selected parameter. Press the ok button again to dismiss orange bar (T).

Operator's Seat

The operator's seat has adjustments for:

- Forward and back horizontal seat position.

⚠ WARNING

Never adjust the seat when the machine is in operation.

Adjust the seat only when the machine is stopped and the parking brake is applied.

All controls must be within easy reach. The operator must be able to move the throttle pedal and the control handles through the complete range of motion.

After adjustments, make sure levers for the seat are fully engaged before using the machine.

Travel Controls

Forward, reverse, lift, tilt, and turning functions are performed using the control handles.

Lift Arm Float

⚠ WARNING

Make sure the attachment is lowered to the ground before activating the lift arm float. Activating float with an attachment raised will cause it to fall, which can cause severe injury or death.

⚠ WARNING

The float mode can be used where the engine has stopped, is unable to be started, and lowering the lift arm is necessary to allow the operator to exit the machine.

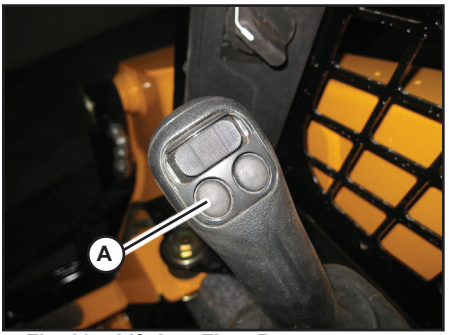


Fig. 20 - Lift Arm Float Button

1. Lower the attachment to the ground.
2. Press button (A, Fig. 20) to activate float:
3. Press button (A) momentarily to apply float momentarily.
4. Press and hold button (A) for 5 seconds to activate continuous float. Press button (A) again to deactivate continuous float.

Engine Stalling

⚠ WARNING

If the engine should stall for any reason during operation, always turn the ignition key all the way counter-clockwise to the "OFF" position before re-starting the engine according to"Starting the Engine" on page 78.

Safety Interlock System (Hydraloc™)

⚠ WARNING

NEVER defeat the safety interlock system by mechanically or electrically bypassing any switches, relays or solenoid valves.

An interlock system is used on the machine for operator safety. Together with solenoid valves, switches and relays, the interlock system:

- Prevents the engine from starting unless the operator is sitting on the seat and the operator restraint bar is down.
- Disables the lift arm, attachment tilt and wheel drives when the operator leaves the seat, turns the key switch to OFF or raises the restraint bar.
- Disables auxiliary hydraulic system when the restraint bar is raised or the key switch is OFF.

Testing the Safety Interlock System

Before leaving a parked machine, check the safety interlock system for proper operation:

Restraint Bar

With the engine running, raise the restraint bar. Move each of the controls. There should be not more than a slight movement of the lift arm, attachment and machine. If there is any significant movement, troubleshoot and correct the problem immediately. Contact your dealer if necessary.

Seat Switch

With the engine off and the restraint bar lowered, unfasten the seatbelt. Lift your weight up off the seat. Try to start the engine. If the engine starts, turn off the engine, and trouble-shoot and correct the problem. Contact your dealer if necessary.

Travel Drive Operation

⚠ WARNING

Never allow anyone to enter inside the turning radius and the machine path.

Signal your intention to move by sounding the horn.

Traveling should be performed with the attachment in transport position.

Avoid sudden stops, starts or turns.

Do not raise the restraint bar while traveling. Raising the restraint bar will apply the parking brake. Loss of control could result.

Do not switch off the ignition switch while traveling. Switching off the ignition automatically applies the parking brake. Sudden braking during travel could result in loss of control.

Visually check behind you before traveling in reverse. Traveling in reverse without checking could result in collision with a person or obstacle.

Remove obstacles in the machine's path before traveling with a load.

Self-Leveling Cancel

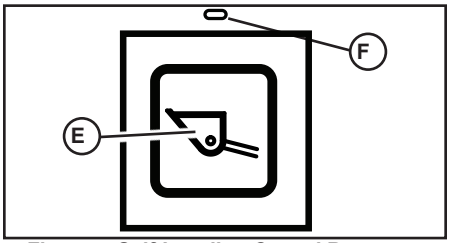


Fig. 45 - Self-Leveling Cancel Button

The self-leveling cancel option allows deactivation of the self-leveling feature when equipped with this option.

To deactivate self-leveling, press the self-level cancel button (E, Fig. 45) on the control pad. To restore self-leveling, press button (E) again.

NOTE: *If equipped with this option, self-leveling is activated by default. If the engine is shut off, self-leveling defaults to the activated condition.*

NOTE: *Indicator (F) above button (E) is lit when the self-leveling cancel option is on and the self-leveling feature is deactivated. This indicator will light if the unit does not have this installed option.*

Connecting/Disconnecting Attachments

⚠ WARNING

To prevent unexpected release of the attachment from the hitch, make sure the attachment is fully locked onto the hitch before using the attachment. On manual All-Tach® hitches, rotate the latch levers fully. On Power-A-Tach® hitches, verify that the pin flags are all the way to the outside of the hitch.

Always verify that the locking pins on the hitch are fully engaged down through the holes in the attachment frame before using the attachment. The attachment could fall off if it is not locked on the hitch and could cause serious injury or death.

Connecting Attachments

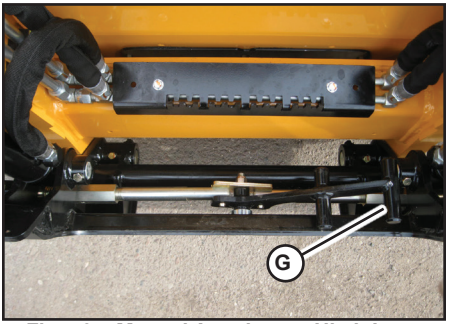


Fig. 46 - Manual Attachment Hitch In Unlocked Condition

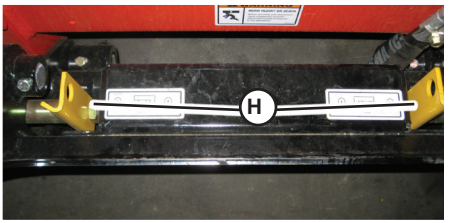


Fig. 47 - Power-A-Tach® System Quick Attach Hitch In Unlocked Condition

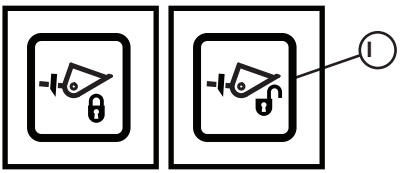


Fig. 48 - Attachment Hitch Unlocked

1. In an open, level area, place the attachment lock into the unlocked position (I, Fig. 46).
2. All-Tach® system manual hitch: Move hitch lock lever (G) all the way to the right.
3. Power-A-Tach® system quick attach hitch: Press the Power-A-Tach® system unlock button (I, Fig. 48) on the control keypad until safety flags (H) have moved all the way in.

⚠ WARNING

Do not use bent, cracked, or otherwise damaged fork arms/pallet forks.

Always inspect pallet forks each time before using. Refer to the pallet fork manufacturer's documentation and/or contact the pallet fork manufacturer for information regarding safe pallet fork condition criteria:

- **• Check the fork arm locks for proper function and/or damage. Do not use pallet forks with damaged locks or locks that do not function properly.**
- **• Visually check the fork arm hooks and/or bends for cracks and/or deformations. Do not use fork arms that are cracked and/or have deformations that make the fork arms unsafe.**
- **• Do not use fork arms that have bends or blades that have more than 10 percent of the original material worn away.**
- **• Check the fork arms blades and tips for deformations or holes..**

Transporting Loads Using Pallet Forks

IMPORTANT: *When the self-leveling feature is on, the tilt angle of the attachment is kept constant when the lift arm is raised. When the lift arm is lowered, self-leveling is not activated. Refer to "Self-Leveling and Return-To Dig (Option)" on page 90 for more information about the self-leveling feature.*

Loading Pallet Forks

1. Stop the machine immediately in front of the material
2. Position the fork arms parallel to the ground.
3. Make sure the fork arms are adjusted as far apart as possible, as allowed by the load, and are both the same distance away from the center-line of the load.
4. Adjust the height of the fork arms to fit the lifting area at the bottom of the pallet.
5. Drive slowly and carefully forward until the fork frame contacts the material.
6. Make sure the pallet is evenly and safely positioned on the pallet fork arms.

Lifting Loads Using Pallet Forks

7. Apply the parking brake.
8. Slowly raise the pallet forks. Do not raise the pallet forks any higher than required. Make sure to not exceed pallet fork load center and/or lifting capacity. Refer to "Payloads/Capacities" on page 51.
9. Lower the load immediately if you are unsure of the load, the equipment, or in case of any unsafe circumstances.
10. Tilt the pallet fork frame back slightly, to help retain the load.

Transporting Loads Using Pallet Forks

11. Make sure the area around and behind the machine is clear of bystanders and obstacles.
12. Slowly and carefully drive in reverse and lower the pallet forks to transport position when it is safe to do so. Carry materials above the ground, and adjust as necessary to clear obstacles. Generally, carry the load as low as safely possible. Tilt buckets back, to prevent spilling material.

Loading and Securing the Machine

⚠ WARNING

Secure the loading ramps to the transport vehicle before loading. Position the loading ramps at the shallowest possible angle. Do not exceed an angle of 15°. Only use ramps with anti-skid surfaces.

Make sure the loading area is clear and access to it is not obstructed.

Make sure the driver of the transport vehicle knows the overall height, width and weight of the vehicle, including the loaded machine, before starting transport.

Know and follow the legal transport regulations for the area in which the transport will occur.

Make sure the loading ramps are free of mud, oil, grease, snow, ice, etc.

Know and follow all transport regulations for the area where the transport will occur.

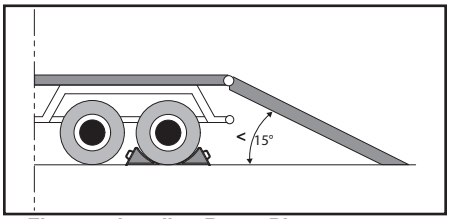


Fig. 74 - Loading Ramp Placement

1. Check the engine oil. The oil level must be at the "MAX" mark on the dipstick. Add oil if needed.

IMPORTANT: *When loading and driving on ramps, the engine can be damaged if the engine oil level is too low.*

2. Start the engine.
3. Raise the hitch plate/attachment enough so that it will not touch the loading ramps.
4. Slowly and carefully drive the machine in reverse onto the transport vehicle, with the bucket end facing down the ramp.
5. Do not adjust travel direction while traveling on the ramps. Instead, drive down off of the ramps, and re-align the machine with the ramps.
6. Position the machine at the lowest possible position on the transport platform, with the center of gravity of the load over center line of the transport vehicle.
7. Lower the bucket onto the loading area.
8. Stop the engine.
9. Raise the safety bars/armrests to disable the hydraulic controls.
10. Remove the ignition key.
11. Do not allow anyone to stay in the cab.
12. Close all doors and the engine cover.
13. Tie down the machine as follows:

a. Make sure the authorized maximum height is not exceeded.

b. Place blocks in front and behind tracks to prevent movement.

c. Securely strap the machine at the tie-down points (Fig. 75) to the platform. Use only belts or chains of sufficient capacity.

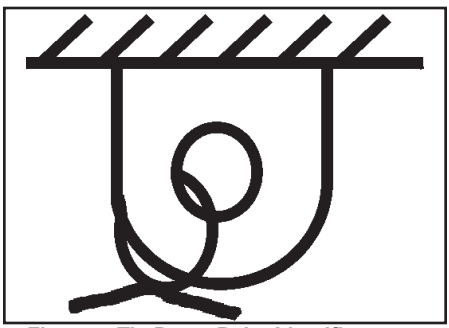


Fig. 75 - Tie-Down Point Identifier

IMPORTANT: *Before transporting the machine through heavy rain, close off the exhaust pipe with a cap or suitable adhesive tape.*

Engine Maintenance

Check Engine Mounting Hardware

All bolts that secure the engine mounting brackets to the engine and the loader frame should be checked and re-tightened as necessary.

⚠ WARNING

Allow hot engine and hydraulic system components to cool before servicing.

Checking Engine Oil Level

Check the engine oil level daily before starting the machine, or after every ten hours of use.

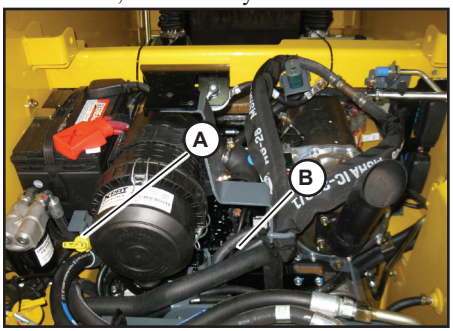


Fig. 81 - Oil Dipstick and Fill Cap

1. Park the machine on a level surface.
2. Perform the "Mandatory Safety Shutdown Procedure" on page 28.
3. Wait until the engine has cooled. Refer to "Maintenance and Service Safety Practices" on page 34.
4. Open the rear door and engine access cover.
5. Pull out the dipstick (A, Fig. 81) and check the oil level. The oil fill cap (B, Fig. 81) is located nearby.
6. Wipe the dipstick with a clean cloth and replace it in the engine. Push it in until it is fully inserted.
7. Remove the dipstick again. The oil level should be within the "Add" and "Full" markings.
8. Markings on the dipstick represent full and low (add oil) levels. Refer to the Maintenance Interval Chart (page 119) for the service interval for replacing the engine oil and filter.

IMPORTANT: *Do not over-fill the engine with oil. Damage could result.*

Changing Engine Oil and Filter

Change the engine oil and filter every 500 hours. Refer to "Fuel System Maintenance" on page 124 for proper grade and type.

IMPORTANT: *Oil should be changed more frequently under heavy work conditions, if higher sulfur content fuel is used, or if multiple standstill regenerations are performed.*

Reduce the oil change interval if the machine is exposed to constant ambient temperatures below -10 °C (14 °F).

1. Park the machine on a level surface.

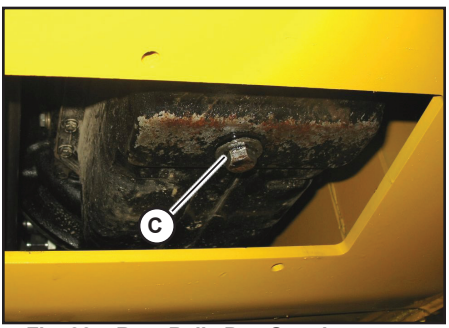


Fig. 82 - Rear Belly Pan Opening.

2. Run the engine until it is at operating temperature. Stop the engine. Remove the rear belly pan (C, Fig. 82).
3. Perform the "Mandatory Safety Shutdown Procedure" on page 28.
4. Wait until the engine has cooled, but is not completely cold. Oil will drain faster and more completely if it is warm.

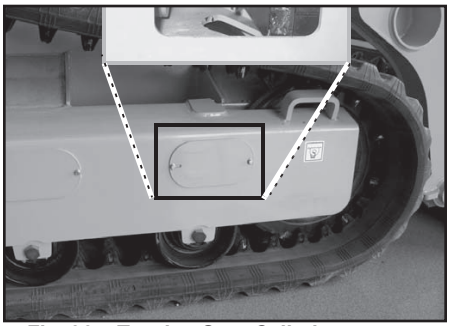


Fig. 96 - Tension Stop Cylinder

1. With the machine running and the drive system not moving, remove tension cylinder stop (Fig. 96) on the side on the machine with the track to be replaced.

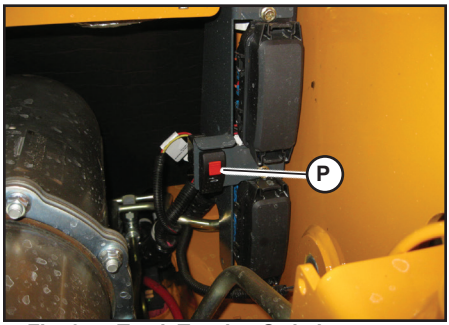


Fig. 97 - Track Tension Switch

2. With the machine running and the drive system not moving, open the engine compartment. Press and hold the red lock button (P, Fig. 97) on the track tension service switch, press the switch to set the track tension cylinders into the service (retracted) position.
3. When the track tension cylinders are in the service (retracted) position, shut off the machine.
4. Raise the machine about 150 mm (6.0”) so the tracks are free to move.

⚠ WARNING

Use solid support blocking. Never rely on jacks or other inadequate supports when maintenance work is being done. Never work under any equipment supported only by jacks.

5. Use a pry bar to pry/guide the old track at off the front idler wheel.
6. Using a hoist with a hook installed and a pry bar, lift/guide the old track off at the drive sprocket. Remove the old track.
7. Using a hoist with a hook, lift the new track and maneuver the track under the rear idler wheel at using a pry bar and your foot.

IMPORTANT: *Guides on the inside of the track must straddle the rear idler.*

8. Place a block under the new track to hold the track against the bottom of the rear idler wheel.
9. Using a hoist with a hook and a pry bar, lift/ guide the new track onto the drive sprocket.

IMPORTANT: *Lugs on the inside of the track must be fully engaged by drive sprocket.*

Using a pry bar and wedging blocks, pull/ guide the new track over the front idler wheel and under the bottom rollers. Carefully, direct an assistant to start the machine and direct the assistant to operate the track drive slowly forward/back to work the track over the front idler wheel.

⚠ WARNING

Keeps hands and feet clear from between the track and the idler/roller wheels when installing tracks. Crushing of body parts and amputation can result.

Chapter 9

TROUBLESHOOTING

Engine Troubleshooting

Problem	Possible Cause	Corrective Action
Engine does not turn over.	Blown Fuse	Check circuit and replace fuse.
	Dead Battery	Charge or replace battery.
	Battery disconnect switch in open position or malfunctioning	Place battery disconnect switch into closed position. Repair or replace if necessary.
	Starter malfunction	Contact dealer.
	Operator not in operator's seat	Operator's seat must be occupied for the engine to start.
	Malfunctioning seat/restraint bar/door switch	Replace seat/restraint bar/door switch.
	Cab door open (if equipped)	Close cab door.
	Engine electronics logic error	Contact dealer.
	Engine fault code(s) displayed	Contact dealer.
	Fuel pump malfunction.	Check electrical connections / voltage to fuel pump. Contact dealer.
Engine turns over but will not start.	Engine cranking speed too slow	Check battery and charge / replace as necessary - tighten battery terminals.
	Fuel tank empty	Fill tank and vent fuel system if necessary.
	Fuel filter plugged or restricted	Change fuel filter.
	Fuel paraffin separation in winter	Use winter grade diesel fuel.
	Fuel line leak	Tighten all threaded connections and clamps, replace fuel line as necessary.
	Fuel shut-off solenoid not energizing (interim Tier 4 engines only)	Check electrical connections / voltage to shut-off solenoid.
	Fuel filter restricted / fuel hose restriction	Replace filter / check for pinched fuel hose.
	Fuel pump malfunction	Contact dealer.
	Water in the fuel filter	Purse water from filter.
	Fuel valve on water separator is in the OFF position	Turn the valve to its ON position.
	Engine fault code(s) displayed	Contact dealer.
	Engine too cold / ambient temperature too low	Pre-heating module malfunction; check connection and voltage and charge / replace as necessary. Install block heater.
Engine overheating	Crankcase oil level incorrect	Adjust oil level.
	Cooling air circulation restricted	With engine off, reposition shroud / contact dealer.
	Fan shroud improperly positioned	With engine off, reposition shroud / contact dealer.
	Improper oil grade or oil excessively dirty	Change engine oil.
	Exhaust restricted	Allow exhaust to cool; remove restriction.
	Air filter restricted	Replace filter(s)
	Low coolant level	Top off coolant.
	Loose fan belt	Tighten fan belt.
	Dirty / restricted radiator	Clean radiator.
	Thermostat malfunction	Replace thermostat.

DTC code				Number of the lamp flashes	Error item		Reference page	
P code	SPN		FMI		Part	State	Descrip-tion	Failure diagnosis
	Decima number	Hexadec-imal number	Decima number					
P0201	654	28E	5	MIL + RSL	Injector 3 4TNV: Cyl No. 1 3TNV: Cyl No. 1 Corresponding port 4TNV: 2 - 2 3TNV: 1 - 1	Injector 3 open circuit (Inherent location of the injector)	*P133*	*P364*
P0262			6	MIL + RSL		Injector 3 coil short circuit	*P135*	*P364*
P1262			3	MIL + RSL		Injector 3 short circuit	*P137*	*P368*
P0203	652	28C	5	MIL + RSL	Injector 4 4TNV: Cyl No. 3 Corresponding port 4TNV: 1 - 1	Injector 4 open circuit (Inherent location of the injector)	*P139*	*P364*
P0268			6	MIL + RSL		Injector 4 coil short circuit	*P141*	*P364*
P1268			3	MIL + RSL		Injector 4 short circuit	*P143*	*P368*
P0611	4257	10A1	12	MIL + RSL	Injector (common)	Injector drive IC error	*P145*	–
P1146	2797	AED	6	MIL + RSL		Injector drive circuit (Bank1) short circuit (4TN: Common circuit for No. 1, No. 4 and all 3TN cylinders)	*P146*	*P368*
P1149	2798	AEE	6	MIL + RSL		Injector drive circuit (Bank 2) short circuit (4TN: Circuit for No. 2 and No. 3 cylinders)	*P148*	*P368*
P1648	523462	7FCC6	13	MIL + RSL	Injector (correction value)	IQA corrected injection amount for injector 1 error	*P150*	–
P1649	523463	7FCC7	13	MIL + RSL		IQA corrected injection amount for injector 2 error	*P151*	–
P1650	523464	7FCC8	13	MIL + RSL		IQA corrected injection amount for injector 3 error	*P152*	–
P1651	523465	7FCC9	13	MIL + RSL		IQA corrected injection amount for injector 4 error	*P153*	–
P1641	522571	7F94B	3	MIL + RSL	SCV (MPROP)	High-pressure pump drive circuit (Low side VB short-circuit)	*P154*	*P370*
P1643			6	MIL + RSL		High-pressure pump drive circuit (Low side GND short-circuit)	*P155*	*P370*
P0629	633	279	3	MIL + RSL		High-pressure pump drive circuit (High side VB short-circuit)	*P157*	*P370*
P1642			6	MIL + RSL		High-pressure pump drive circuit (High side GND short-circuit)	*P159*	*P370*
P0627			5	MIL + RSL		High-pressure pump drive circuit (Open circuit)	*P160*	*P370*
P062A	522572	7F94C	6	MIL + RSL		High-pressure pump drive circuit (Drive current (high level))	*P161*	*P370*
P1645			11	MIL + RSL		High-pressure pump drive circuit (Pump overload error)	*P163*	*P370*
P0088	157	9D	0	MIL + RSL	Abnormal rail pressure	Actual rail pressure rise error	*P165*	–
P0094			18	MIL + RSL		Rail pressure deviation error during the actual rail pressure drop	*P167*	–
P0093			15	MIL + RSL		Rail pressure deviation error during the actual rail pressure rise	*P169*	–
P000F			16	MIL + RSL	PLV (Common rail pressure limit valve)	PLV open valve	*P171*	–
P1666	523469	7FCCD	0	MIL + RSL		Rail pressure fault (The times of PLV valve opening error)	*P173*	–
P1667	523470	7FCCE	0	MIL + RSL		Rail pressure fault (The time of PLV valve opening error)	*P175*	–
P1668	523489	7FCE1	0	MIL + RSL		Rail pressure fault (The actual rail pressure is too high during PRV limp home)	*P177*	–
P1665	523468	7FCCC	9	MIL + RSL		Rail pressure fault (Controlled rail pressure error after PLV valve opening)	*P179*	–
P1669	523491	7FCE3	0	MIL + RSL	Rail pressure control	Rail pressure fault (Injector B/F temperature error during PLV4 limp home)	*P181*	–
P1670	523460	7FCC4	7	MIL + RSL		Rail pressure fault (Operation time error during RPS limp home)	*P183*	–
P0219	190	BE	16	MIL + RSL	Overspeed	Overspeed	*P285*	*P393*
P0660	2950	B86	5	MIL + AWL	Intake throttle drive circuit	No-load of throttle valve drive H bridge circuit	*P184*	*P373*
P1658			3	MIL + AWL		Power short circuit of throttle valve drive H bridge output 1	*P185*	*P373*
P1659			4	MIL + AWL		GND short circuit of throttle valve drive H bridge output 1	*P186*	*P373*
P1660			6	MIL + AWL		Overload on the drive H bridge circuit of throttle valve	*P187*	*P373*
P1661	2951	B87	3	MIL + AWL		VB Power short circuit of throttle valve drive H bridge output 2	*P188*	*P373*
P1662			4	MIL + AWL		GND short circuit of throttle valve drive H bridge output 2	*P189*	*P373*