

CENTAUR



OPERATOR'S MANUAL

**Do not remove this
manual from this vehicle.**

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A MESSAGE FROM THE PEOPLE WHO BUILT YOUR CENTAUR

Thank you for selecting a **CENTAUR** off-road utility vehicle!

Ontario Drive & Gear Limited has been building off road vehicles since 1967. By listening carefully to our customers and responding to their needs, we have been constantly improving them and will continue to do so.

Over thirty thousand vehicles have provided reliable service all over the world. From Britain to the Far East, Alaska to the Antarctic, and from the tropical forests of South America to the deserts of Saudi Arabia. We are proud to provide you with a vehicle that represents the ultimate in all-terrain transportation.

Your safety and the safety of all **CENTAUR** users is of the greatest concern to us. You will find numerous safety statements in this manual. Please read and follow them carefully. Always be safety conscious when you operate your **CENTAUR** and remember it is a motorized vehicle.

The **CENTAUR** is easy to drive and you will soon be tempted to take on new challenges. Please take the time to develop your driving skills before doing so. There is a Driver Training Program available through your servicing dealer. Observe the recommendations outlined in this Operator's Manual and remember; some things are just impossible, even with a **CENTAUR**.

WELCOME TO THE WORLD WIDE CENTAUR FAMILY!

Centaur Service Manual

Ontario Drive & Gear has a service manual which provides the Centaur owner with step-by-step instructions on how to perform full service procedures on your vehicle. Everything from removal and replacement of brake pads to rebuilding the transmission. It's all there. Removal and replacement of engines is included, however, engine overhaul is not. A separate overhaul manual is available for each engine from your Centaur dealer. Order the service manual on CD-ROM from your dealer.

NOTE

Read this manual *before* you operate your **CENTAUR**. It contains safe operating instructions and warns the user about potential hazards that can result in personal injury.

Warnings are identified in the text by the following symbol:



Warning text warns the user about potential hazards that can result in personal injury or death.

Cautions are identified in the text by the following symbol:



Caution text contains cautions that can prevent damage to the vehicle.

This manual is based on the latest product information available at the time of printing. Ontario Drive & Gear Limited reserves the right to make changes at any time and without obligation.

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PREFACE

This manual describes the controls, operation and basic maintenance procedures for all CENTAUR vehicles. Please take the time to read this manual carefully, for your safety and that of others. By following these instructions, you will ensure extended, trouble free operation of your vehicle.

For maintenance and adjustment of the engine, refer to the engine manufacturer's operation and maintenance manual included in your vehicle's information package.

Before you drive your CENTAUR, make sure you understand how to use all controls, particularly the brakes and steering system. Learn how to drive your vehicle in an open level area, away from buildings, trees and other obstacles, until you are completely familiar with its operating characteristics. Drive very slowly until your driving skills improve, and drive with caution and consideration at all times. The risk of accident or injury is greatest during the first weeks of use. Take special care during this period. ALWAYS RESPECT OUR ENVIRONMENT.

CAUTION TO THE CENTAUR OWNER/OPERATOR

- Make sure everyone who drives this vehicle receives proper operating instructions and reads this Operator's Manual.
- No one under the age of 16 should be allowed to operate the CENTAUR. Children under the age of 16 may not have the skills, abilities or judgement needed to operate the Centaur safely and may be involved in an accident causing severe injury or death.
- Never allow anyone under the influence of alcohol or any other intoxicating substance to drive or ride in the vehicle.
- Wear an approved safety helmet and eye protection when driving or riding in the vehicle.
- Special operating and safety procedures described in this manual must be observed before and during operation.
- The use of approved hearing protection is recommended.
- Equip your vehicle with a fire extinguisher and a first aid kit.
- Equip your vehicle with basic tools for emergency repairs.
- Before starting your engine, check for spilled fuel and wipe any up immediately. Any fuel is a potentially explosive substance that can cause serious personal injury when ignited.
- Keep the floor pans secured in place at all times. Fingers, feet, animal tails or paws can be injured in the drive components beneath the floor pans. The floor pans also help keep damaging debris out of the drive components.
- Make sure all passengers remain seated and use all safety restraints while the vehicle is in motion. Advise your passengers to use the hand rails and bars at all times.
- Wear seatbelts when riding in a vehicle equipped with a ROPS.
- Never overload your vehicle. Trying to steer an overloaded vehicle can damage the steering system. Overloading your vehicle can lead to costly damage to steering system, transmission, drive chains, axles or bearings. Follow the recommended load capacity for your vehicle listed in Section 1.
- Do not drive the vehicle at high speeds over unfamiliar or rough terrain. Personal injury or vehicle damage may result.
- Certain terrain and steep hills cannot be traversed safely with the Centaur or any other vehicle. Do not attempt to drive over terrain that is questionable.
- Use common sense at all times when driving your vehicle.

IMPORTANT

Operate this vehicle with safety constantly in mind. Off-road vehicles face unpredictable and often hazardous terrain conditions. It is ultimately the operator's responsibility to handle the vehicle safely within its limitations and to decide when and where to travel.

TABLE OF CONTENTS

SECTION	PAGE
1.0 GENERAL INFORMATION	
1.1 AMPHIBIOUS OPERATION	1
1.2 MAINTENANCE PROCEDURES	1
1.3 WIND CHILL FACTOR.....	1
1.4 MODEL IDENTIFICATION	1
1.4.1 Centaur Vehicle Capacity.....	3
1.5 IDENTIFICATION AND LOCATION OF CONTROLS.....	3
1.6 CE MARKED CENTAURS.....	3
1.7 INFORMATION LABELS	4
2.0 GENERAL OPERATING INFORMATION	
2.1 NEW VEHICLE “BREAK-IN” PROCEDURE	5
2.2 PRE-OPERATION CHECKS	5
2.3 CARRYING PASSENGERS AND CARGO	5
2.4 FUELING THE VEHICLE	5
Centaur 950DT - Diesel	6
2.5 VENTED FUEL SYSTEM	6
2.6 INSTRUMENT CLUSTER	6
3.0 OPERATING INSTRUCTIONS	
3.1 STEERING	7
3.2 BRAKES.....	7
3.3 PARKING/EMERGENCY BRAKE	7
3.4 THROTTLE CONTROL	7
3.5 STARTING PROCEDURE	7
3.5.1 Diesel Powered	7
3.6 STOPPING THE ENGINE	8
3.7 SELECTING AND CHANGING TRANSMISSION GEARS	8
3.8 HEADLIGHTS	8
4.0 DRIVING PROCEDURES	
4.1 DRIVING STRAIGHT AHEAD	10
4.2 STOPPING THE VEHICLE	10
4.3 TURNING THE VEHICLE	10
4.4 BACKING THE VEHICLE UP	10
4.4.1 Turning The Vehicle While Backing Up.....	10
5.0 DRIVING PROCEDURES IN UNUSUAL CONDITIONS	
5.1 REMOTE AREA USE	11
5.2 ANGLE OF OPERATION	11
5.3 UPHILL OPERATION	11
5.4 DOWNHILL OPERATION	11
5.5 SIDE SLOPE OPERATION	11
5.6 WATER CROSSING - GENERAL	12
5.6.1 Entering the Water	13
5.6.2 Driving Procedures in Shallow Water	13
5.6.3 Driving Out of Water	13

TABLE OF CONTENTS

SECTION	PAGE
5.7	WINTER OPERATION 13
5.7.1	Use on Ice Covered Bodies of Water 13
6.0	OIL, FILTER AND LUBRICATION INFORMATION
6.1	ENGINE OIL INFORMATION 14
6.1.1	Checking the Engine Oil Level 14
6.1.2	Recommended Engine Oil 14
6.1.3	Changing Engine Oil 14
	Draining the Engine Oil 14
	Refilling the Engine 15
6.2	TRANSMISSION OIL INFORMATION 15
6.2.1	Checking the Transmission Oil Level 15
6.2.2	Changing the Transmission Oil 15
	Refilling the Transmission 15
6.3	FILTER INFORMATION 15
6.3.1	Air Filter 15
6.3.2	Fuel Filter 16
	950DT and 954DT 16
	To replace fuel filter element 16
6.3.3	Engine Oil Filter 16
6.3.4	Transmission Oil Filter 16
6.4	LUBRICATION INFORMATION 16
6.4.1	General 16
6.4.2	Drive Chain Lubrication 16
6.4.3	Driven Clutch Maintenance 17
6.4.4	Axle Bearing Lubrication 17
7.0	MAINTENANCE INFORMATION
7.1	ELECTRICAL SYSTEM 18
7.1.1	General 18
7.1.2	Battery 18
	Checking Fluid Level 18
	Charging the Battery - Exide 18
	Charging and Testing the Battery - Optima 18
	Cleaning the Battery Terminals and Cable Connections 19
	Cleaning the Battery 19
7.1.3	ELECTRICAL SYSTEM FUSES 20
7.2	DRIVE SYSTEM & TIRES 20
7.2.1	DRIVE BELT 20
	To Remove the Drive Belt 20
	To Install the Drive Belt 20
7.2.2	CLUTCH MAINTENANCE 21
	Clutch Inspection 21
7.2.3	DRIVE CHAINS 21
	To Remove the Drive Chains 21
	To Install the Drive Chains 21
7.2.4	TO REPLACE A SLIDER BLOCK 22
7.2.5	TIRE REPAIR AND REPLACEMENT 22
7.3	MECHANICAL PARKING/EMERGENCY BRAKE 23
7.3.1	GENERAL 23
7.3.2	BRAKE CALIPER ADJUSTMENT 23
	To adjust the brake caliper 23

TABLE OF CONTENTS

SECTION	PAGE
7.3.3 BRAKE PAD REPLACEMENT	23
7.3.4 BRAKE CABLE ADJUSTMENT	24
To adjust the brake cable	24
7.4 HYDRAULIC BRAKE	24
7.4.1 GENERAL	24
7.4.2 BRAKE FLUID LEVEL	24
7.4.3 CHANGING BRAKE FLUID	25
7.4.4 HYDRAULIC BRAKE PAD INSPECTION	25
Brake Pad Inspection Procedure	25
To replace the brake pads	25
7.4.5 ENGINE COOLING & EXHAUST SYSTEM	25
7.5 STEERING SYSTEM	26
7.5.1 STEERING CENTERING ADJUSTMENT	26
7.5.2 STEERING WHEEL & LOCK ADJUSTMENT	26
7.5.3 HYDROSTATIC TRANSMISSION DRIVE BELT	27
7.6 SHIFTING SYSTEM	27
7.6.1 SHIFT CABLE ADJUSTMENT	27
7.6.2 THROTTLE CABLE ADJUSTMENT	27
7.7 MAINTENANCE SCHEDULE	28
8.0 TROUBLESHOOTING	29
9.0 CLEANING AND STORAGE	
9.1 CLEANING THE VEHICLE	31
9.2 STORING THE VEHICLE	31
Clean the Vehicle	31
Drain the Fuel System	31
Prepare the Battery for Storage	31
Protect the Electrical System	31
Raise the Vehicle	31
Preparing the Engine for Storage	31
10.0 POTENTIAL HAZARDS	32
11.0 ACCESSORY INFORMATION	
11.1 GENERAL	36
11.2 REAR CARGO TIE DOWN BARS (Part No. 849-116)	36
11.3 ALL SEASON TRACK KIT (Part No. 849-150)	36
11.3.1 Track Installation	36
11.3.2 Operating Precautions	37
11.4 WINTER TRACK KIT (Part No. 849-160)	38
11.4.1 Installing the Axle Extension	38
11.4.2 Track Installation	38
11.4.3 Removal of Tracks	39
11.4.4 Operating Precautions	39
11.5 ICE CLEAT KIT (Part No. 848-130)	39
11.6 WINCH KIT (Part No. 849-214)	40
11.6.1 Rules For Safe Operation	40
11.6.2 Tips for Extending the Life of Your Winch	41
11.7 RECEIVER WINCH KIT (Part No. 849-123)	42
11.8 BILGE PUMP KIT (Part No. 849-146)	42

TABLE OF CONTENTS

SECTION	PAGE
11.9 SNOW PLOW KIT (Part No. 657-106)	42
11.9.1 Operating Guidelines	42
11.10 UTILITY TRAILER (Part No. 695-80BL)	42
11.10.1 Operating Precautions	43
11.11 CAB HEATER (Part No. 848-110)	43
11.12 DUMP BOX KIT (Part No. 835-100)	43
11.13 CARGO LINER (Part No. 848-123)	43
11.14 CENTAUR FOUR POINT LIFT KIT - (Part No. 848-121)	43
11.15 LIGHT GUARD KIT (Part No. 849-134)	44
11.16 BRUSH GUARD KIT (Part No. 849-191)	44
11.17 MUD FLAP EXTENDERS (Part No. 821-105)	44
11.18 TRANSMISSION OIL HEATER (Part No. 613-103)	44
 APPENDIX	
1 SPECIAL TOOLS	
10R VICE GRIP MODIFICATION	45
DRIVER CLUTCH REMOVAL TOOL 658-17	45

SECTION 1

GENERAL INFORMATION

1.1 AMPHIBIOUS OPERATION

While the Centaur has been designed with a one piece polyethylene sealed lower body, the vehicle is not intended to be used as an amphibious vehicle. Floating the Centaur across lakes, streams and ponds could cause the vehicle to take on water with the possibility of capsizing the vehicle, causing injury or drowning to the operator and passenger. Ontario Drive & Gear does not recommend floating the Centaur across any bodies of water.

1.2 MAINTENANCE PROCEDURES

Maintenance procedures described in this manual can be carried out by the operator. These procedures include:

1. checking fluid levels
2. changing the engine and transmission oil
3. cleaning and replacing filters
4. preventative maintenance
5. inspections, adjustments, repairs and trouble- shooting

If you perform your own maintenance, carefully follow the lubrication and preventative maintenance schedule (Section 7.7). A Centaur Service Manual on CD-ROM or in print, is available from your Centaur dealer.

Contact your CENTAUR dealer for a list of the services they offer to users of the CENTAUR.

The trouble-shooting chart (Section 8) contains information for locating and correcting mechanical problems. In many cases, potential problems can be identified by unusual noises, sluggishness or vibration, before they result in a breakdown. Refer to the chart to identify these symptoms. Take immediate corrective action or take the vehicle to a CENTAUR dealer for service.

This manual does not provide detailed maintenance or servicing information for the engine. Refer to the engine manufacturer's manual (supplied with each CENTAUR) for important warranty, service and operating information.

If the engine requires servicing, take the vehicle to an authorized engine service outlet.

1.3 WIND CHILL FACTOR

Why does it feel much colder outdoors on a windy day than when there's no wind, especially in winter? The cooling effect of the wind makes it feel like it's colder than it really is. This combined effect of wind and low temperature is known as the "wind chill factor".

Centaur operators should be aware of the wind chill factor. Dress warmly and make sure exposed skin is protected. Pay particular attention that young passengers are properly dressed with their hands and faces well protected.

WIND CHILL										
Wind Speed										
km/h	8	16	24	32	40	48	56	64		
Actual Temp. (C)										
0	-2	-8	-11	-14	-16	-17	-19	-19	Gradually Increasing	
-5	-7	-14	-18	-21	-23	-25	-26	-27	Danger	
-10	-12	-20	-25	-28	-31	-33	-34	-35	Dangerous	
-15	-18	-26	-32	-35	-38	-40	-42	-43		
-20	-23	-32	-38	-43	-46	-48	-50	-51		
-25	-28	-38	-45	-50	-53	-56	-57	-59	Extremely	
-30	-33	-45	-52	-57	-61	-63	-65	-67	Dangerous	
-35	-39	-51	-59	-64	-68	-71	-73	-75		
-40	-44	-57	-65	-71	-75	-79	-81	-83		
-45	-49	-63	-72	-78	-83	-86	-89	-90		
-50	-54	-69	-79	-85	-90	-94	-96	-98		

1.4 MODEL IDENTIFICATION

The vehicle identification plate is fastened to the upper frame to the right of the passenger's knee. The model and serial numbers are stamped into it.

SECTION 1

GENERAL INFORMATION

Carefully observe the maximum load capacity for your vehicle on land as listed in the following:

Model	CENTAUR-DT		
Engine Make	DM 950 DT (Turbo Diesel)		
	Briggs & Stratton Daihatsu		
Type	Turbo Diesel, in-line 3 Cylinder, 4 cycle, liquid cooled		
Displacement	954 cc (58 cu. in.)		
Horsepower	34 @ governed 3800 rpm		
Torque	58 ft. lbs. @ 2400 rpm.		
Electrical	12 volt, 60 amp alternator, 960 CCA battery		
Brakes	Hydraulic disc brakes with hand operated mechanical parking brake.		
Steering	Hydrostatic skid steering.		
Driver Controls	LCD Digital Gauge Cluster features Speedometer, Odometer, Voltmeter, Hourmeter, Tachometer, Engine Coolant, Temperature, plus Low Oil Pressure, Parking Brake Reminder and Check Engine Lights. Steering wheel, dash mounted HI, LOW and REV gear selector with floor mounted accelerator and brake pedals.		
Clutch & Transmission	Continuously variable belt driven torque converter (CVT). Dual differential transmission, HI, LOW, NEUTRAL and REV		
Final Drive System	RC80 roller chains from transmission to eight 1.59" (40mm) diameter axles. Automatically adjusted tensioner for each drive chain. Tapered roller bearings in an oil bath support each axle. Semi-automatic chain lubrication system.		
Frame	Powder coated, 3" tubular steel, lower body support pan, welded construction. FEA analyzed for strength and durability.		
Body	Vacuum formed lower hull and standard full skid plate formed from high density polyethylene (HDPE)		
Load Capacity	1500 lbs/680 kg on land		
Towing Capacity*	2000 lbs/907 kg of drawbar pull.		
Seating Capacity	Front bench seat for two persons		
Fuel Capacity	12.6 U.S. gal./48 litres providing approx. 10 hours of operation		
Speed**	28 mph/45 km/h		
Shipping Weight	2200 lb/1000 kg		
Tires	HEAT AT190 25x12.00-9 NHS		
Vehicle Weight	2520 lbs / 1143 kg with Multi-Purpose Tracks – 2720 lbs / 1234 kg with Snow Tracks		
Ground Pressure	Tires:	Zero Penetration	5 PSI/ 34 kPa
	Multi-purpose Tracks:	Zero Penetration	1.5 PSI/ 10 kPa
		3" of Penetration	1.0 PSI/ 6.8 kPa
	Snow Tracks:	Zero Penetration	0.7 PSI/ 4.8 kPa
		3" of Penetration	0.6 PSI/ 4.1 kPa
Ground Clearance	8"/200 mm to centre of lower body		
Operating Conditions	All weather, all terrain, -40°F to +104°F (-40°C to + 40°C)		
Transport	Truck, trailer or helicopter lift		

* Towing capacity is approximate and depends on terrain, load on vehicle, incline and decline.

** All speeds are approximate and depend on conditions.

Design and specifications subject to change without notice. Options may not be exactly as shown. Please visit us at www.Centaur8x8.ca for updated information.

SECTION 1

GENERAL INFORMATION

1.4.1 Centaur Vehicle Capacity

CAUTION

Vehicle capacity includes occupants, cargo, fuel, and all accessories. Capacity for occupants and cargo is reduced by the weight of accessories as shown in the chart below.

Available vehicle capacity must be reduced if your vehicle is equipped with any accessories. Reduce the available capacity by the total weight of accessories fitted to your vehicle.

<u>Accessory On Vehicle</u>	<u>Reduce By On Land</u>
Cab Heater	20 lbs. (9 kg)
Winch Kit	45 (21)
Brush Guard	20 (9)
Cargo Liner	30 (14)
Dump Box	240 (109)
Snow Plow	150 (68)
Multi-Purpose Tracks	310 (141)
Winter Tracks	515 (234)

1.6 CE MARKED CENTAURS

CE marked Centaurs include:

- CE marked serial number label
- horn, activated from driver's compartment
- the weighted root mean square value for vibration of the vehicle does not exceed 2.5 m/s^2
- the weighted root mean square value for vibration to which the body is subjected does not exceed 0.5 m/s^2
- airborne noise emissions do not exceed:

Drivers position, stationary - 95.7 dB(A) @ 3800 rpm

Drivers position, stationary - 104.4 dB(C) @ 3800 rpm

1.5 IDENTIFICATION AND LOCATION OF CONTROLS



SECTION 1

GENERAL INFORMATION

1.7 INFORMATION LABELS

There are labels on all models which indicate operating hazards and provide special operating instructions. Information about the operation of the vehicle, correct fueling procedures, and steering system use has been provided on distinctive yellow and black labels fastened to the various locations on the CENTAUR.

WARNING

- When moving in reverse, steering operation is opposite to automobiles.
- Engine failure will cause loss of steering. Bring vehicle to a complete stop before attempting to restart.

CAUTION

Do NOT use steering unless vehicle is moving. Damage to the steering system could result.

WARNING

- Do not use the steering wheel as an entry/exit handle. Sudden vehicle motion causing serious injury or death may result.

ATTACH TO DASHBOARD IN FULL VIEW OF OPERATOR

THIS VEHICLE IS EQUIPPED WITH A BACK-UP ALARM WHEN BACKING, THE

ALARM MUST SOUND

THE OPERATOR IS RESPONSIBLE FOR THE SAFE USE OF THIS VEHICLE

WARNING

DO NOT OPERATE VEHICLE WITH ARM REST UP. STEERING WHEEL WILL BE LOCKED.



WARNING

IGNORING ANY OF THE ATTACHED WARNINGS MAY RESULT IN SERIOUS INJURY OR DEATH.

SAFE OPERATION

- Read vehicle Operator's Manual before attempting to operate.
- This vehicle is intended for off-road use only.
- Operation of this vehicle on steep slopes is dangerous and requires a skilled and careful operator.
- Seat belts must be properly adjusted and worn by all occupants at all times.
- Do not start or operate without all guards, shields, floor pans and engine cover in place.
- Articles must not be placed on top of the ROPS.
- Wear suitable protection.

VEHICLE CAPACITY CHART	
Accessory	Reduce Vehicle
On Vehicle	Payload By
Cab Heater	20lbs. (9 kg)
Winch Kit	45 (21)
Brush Guard	20 (9)
Cargo Liner	30 (14)
Dump Box	240 (109)
Snow Plow	150 (68)
Multi-Purpose Tracks	310 (141)
Winter Tracks	515 (234)

VEHICLE LOAD CAPACITY

Land 680 kg (1500 lbs.)*

* Capacity includes occupants, fuel and all accessories.

- Unladen mass 950 kg (2100 lbs.)
- Max. draw bar pull 8900 N (2000 lbs.)
- Max. vertical draw bar load 890 N (200 lbs.)

WARNING

VEHICLE REFUELING

- Shut off engine when refueling
- Keep open flame away when refueling
- Check for and clean up spilled fuel immediately
- Retighten fuel cap securely

Figure 1.1 Location of Information Labels

SECTION 2

GENERAL OPERATING INFORMATION

2.1 NEW VEHICLE “BREAK-IN” PROCEDURE

To obtain long term, trouble free service from your vehicle, observe the following break-in guidelines:

1. Vary the speed of the vehicle for the first tank of fuel. Avoid full power during break-in period.
2. Check engine and transmission oil levels daily during break-in period.
3. Change the transmission oil after initial 25 hours of operation. Failure to do so can result in damage to the transmission bearings or gear surfaces. Refer to Section 6.2.2 for transmission oil changing instructions.
4. Change the engine oil after the first 25 hours of operation. Refer to Section 6.1.3 of this manual for oil change information.
5. Never overload your vehicle. Trying to steer an overloaded vehicle can over pressurize and damage the steering system. This will lead to a loss of steering control. Overloading the vehicle can lead to premature steering system failure and costly damage to drive chains, axles or bearings. Follow the recommended load capacity for the vehicle listed in Section 1.4.

2.2 PRE-OPERATION CHECKS

Carefully follow the engine manufacturer’s recommended pre-operation/daily checks as well as the following:

1. Check the fuel level on the gauge.
2. Check the air pressure in all tires. All tires should be the same pressure. For light use with low payloads pressurize to 5 psi (24 kPa). For heavy use with high loads use up to 7 psi (48 kPa.)
3. Test the operation of the gas pedal by pressing to the floor and releasing it. The throttle must operate smoothly and return automatically to the fully closed position.
4. Test the operation of the steering lockout by lowering the driver’s armrest. The steering wheel should turn freely either way but be locked in the centre position when the armrest is in the raised position.
5. Check the brake travel by pressing on the pedal. See Section 7.3.4 for proper adjustment details.
6. Check the engine intake and exhaust screen for obstruc-

tions. Clear any debris that has accumulated.

2.3 CARRYING PASSENGERS AND CARGO

1. Keep cargo as low as possible and evenly distributed.
2. Use extreme CAUTION when negotiating inclines with a loaded vehicle. Heavy loads and high loads decrease the stability of the vehicle and may cause it to roll. Be prepared to shift occupant weight and load forward or have passengers get out of the vehicle to climb an incline.
3. Secure cargo to prevent it from shifting while driving.

2.4 FUELING THE VEHICLE

WARNING

Gasoline and diesel fuel are extremely flammable and can explode under certain conditions. Do not add fuel while the engine is running or hot. If fuel is spilled in, on or around the vehicle, wipe it up immediately. Flush out any fuel spilled in the vehicle with water and allow it to drain out through the drain plug holes. Do not smoke when filling the fuel tank.

The Centaur is equipped with a 48 litre (10.6 Imp. Gal., 12.7 U.S. Gal.) polyethelene fuel tank located underneath the driver’s seat. Depending on loading and driving conditions, a Centaur can be driven for 7 to 12 hours on one tank of fuel. Verify your vehicle’s actual fuel consumption *before* attempting any long trips. Never travel in remote areas or set out on long trips *without* a full tank of fuel and adequate spare fuel stored in approved watertight fuel containers.

The fuel filler neck and fuel cap are located on the left side of the vehicle behind the driver’s seat. Replace the fuel cap if fuel leakage occurs, or if moisture is detected in the fuel. Use ODG Part No. 126-46 fuel cap.

Never fill the tank to the point where the fuel level rises into the filler neck. If the tank is overfilled, heat may cause the fuel to expand and overflow through the vent.

Portable fuel containers may contain contaminants (dirt, water, etc.) that will cause engine operating problems. Use only clean, approved fuel containers.

After filling the fuel tank, be sure the fuel cap is replaced securely. Do not drive the vehicle unless the fuel cap is properly in place.

SECTION 2

GENERAL OPERATING INFORMATION

Never use untreated gasoline that has been stored for more than 45 days. Stale diesel fuel can cause gum deposits to form in the fuel lines and carburetor. These deposits clog the fuel system and cause engine starting and operating problems.

When storing the CENTAUR for 45 days or more, use diesel fuel conditioner to treat fuel in the fuel tank and fuel containers.

CAUTION

Do not use Bio-Diesel with Parker Superflex-FI fuel hose equipped machines. Please contact manufacturer for alternative fuel hoses.

**Vehicles built before May 2006 used fuel lines that are NOT compatible with Bio-Diesel fuel.*

Centaur 950DT - Diesel Turbo

Use clean, fresh diesel fuel with a minimum of 40 cetane. Purchase fuel in quantity that can be used within 30 days to assure fuel freshness.

CAUTION

Do not use kerosene or gasoline instead of diesel fuel. Failure to observe this caution will damage the engine and void manufactures warranty.

Keep fuel tank full. Do not over-fill. Allow space in tank for fuel expansion. Check for fuel leaks at fuel filter, injector pump, fuel lines, etc.

If the fuel tank does run dry, use the priming pump on the fuel filter to bleed the air from the fuel line then attempt to restart the engine. You may have to bleed the system several times in order to restart engine.

2.5 VENTED FUEL SYSTEM

Centaur models have fuel tanks that are vented through a special hose connected to the filler neck assembly that runs along the firewall to a position up under the engine cover.

2.6 INSTRUMENT CLUSTER

The CENTAUR is equipped with an LCD instrument cluster. Figure 2-1.

It displays battery voltage, hourmeter, odometer, speedometer, coolant temperature and tachometer. There are indicator lights for parking brake, low oil pressure, water in fuel and glow plug preheat.

Gauges are calibrated in metric, speed is in km/h and odometer is in km. Pressing the KM/MILE button will switch the speed to mph and the odometer to mi.

To toggle between odometer and hourmeter, press MODE.

The temperature reading on the gauge is as follows:

- 1 bar: <131°F / <55°C
- 2 bars: 132-166°F / 56-74°C
- 3 bars: 167-202°F / 75-94°C
- 4 bars: 203-237°F / 95-114°C
- 5 bars: >237°F / >115°C

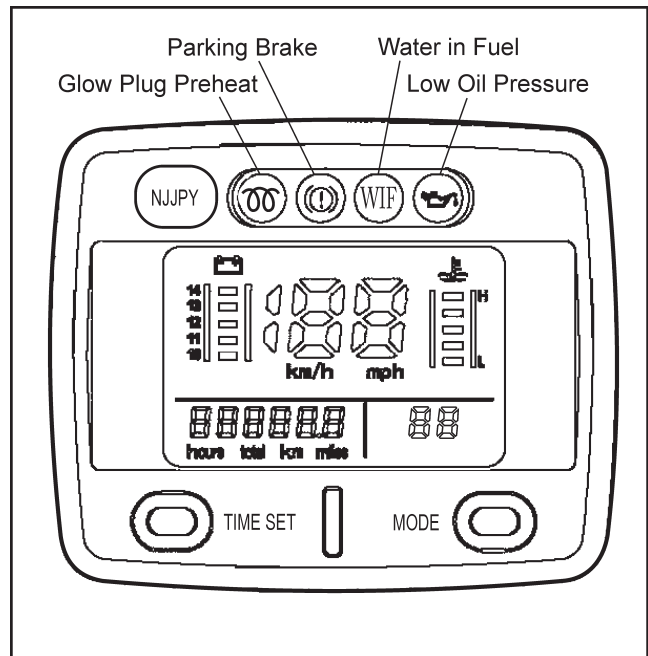


Figure 2-1. LCD Instrument Cluster.

SECTION 3

OPERATING INSTRUCTIONS

3.1 STEERING

The steering wheel is used to turn the vehicle whenever the engine is running. When moving forward, steering is similar to an automobile. When moving in reverse, steering is opposite to an automobile, similar to backing up a trailer.

WARNING

When moving in reverse, steering operation is opposite to automobiles. Practice driving backwards before taking the vehicle off road.

The steering system works whenever the engine is running, even when the gear selector is in neutral. The CENTAUR is a skid steer vehicle. During a turn, the rear of the vehicle swings outward as the vehicle pivots on the tires on the inside of the turn. To make a right hand turn, the rear of the vehicle skids out to the left. To make a left hand turn, the rear of the vehicle skids out to the right.

WARNING

When turning, the back of the vehicle swings to the opposite direction of the turn. Always take care to avoid hitting persons or objects with the rear of the vehicle! Serious injury or death can result!

The steering system is powered by a hydrostatic transmission and works best when engine r.p.m. is higher than at idle. Avoid turning the steering wheel when engine is idling.

CAUTION

Do NOT use steering unless vehicle is moving. Do NOT use steering wheel to assist in entering or exiting the vehicle. Damage to the steering system could result.

Centaur vehicles built after August 2001 have a steering lock-out system. The armrest on the driver's side is mechanically linked to the steering control. The steering wheel is locked in the center position when the armrest is in the raised position. When the armrest is in the lowered position, the steering is unlocked and ready for use.

WARNING

Ensure armrest is lowered and steering wheel moves freely before driving the Centaur. If the steering lockout feature malfunctions, steering will be impaired which could cause an accident resulting in serious injury or death.

3.2 BRAKES

The Centaur has a foot operated brake pedal. To stop the vehicle, press firmly on the brake pedal.

3.3 PARKING/EMERGENCY BRAKE

The Centaur is equipped with a parking/emergency brake. The lever is located midpoint under the dash and is activated by pulling towards the driver. Release the brake by pushing the button on the end of the lever and pushing the lever as far forward as possible.

3.4 THROTTLE CONTROL

Vehicle speed is controlled by the accelerator pedal. To increase vehicle speed, press on the accelerator pedal. To decrease vehicle speed, remove pressure on the accelerator pedal.

3.5 STARTING PROCEDURE

WARNING

Never start or run the engine in a closed building or confined area. Engine exhaust gases contain poisonous carbon monoxide. Carbon monoxide is odourless, colourless and can cause serious personal injury or death.

All Centaur models are equipped with key operated, electric start systems.

Centaur vehicles built after December 2001 have a neutral safety switch that prevents the vehicle from being started unless the vehicle gear selector is in neutral.

3.5.1 Diesel Powered

1. Shift the transmission into neutral.
2. Turn the key to the "ON" position. The "DIESEL PREHEAT" light will come on for approximately five seconds.
3. When the "DIESEL PREHEAT" light goes out, turn the key to the "START" position.
4. Release the key as soon as the engine starts; the key will automatically return to the "RUN" position.

SECTION 3

OPERATING INSTRUCTIONS

5. If the engine fails to start, refer to the trouble-shooting chart in Section 8 for corrective action.

3.6 STOPPING THE ENGINE

Bring the vehicle to a complete stop. Release the accelerator pedal. Ensure that the steering wheel is positioned such that the vehicle doesn't turn. Let the engine speed return to idle and turn ignition switch to the "OFF" position. Always remove key from ignition switch when leaving the vehicle unattended.

3.7 SELECTING AND CHANGING TRANSMISSION GEARS

The CENTAUR is equipped with a four position transmission. The gearshift lever is located to the left of the dash.

- * R (Reverse) - for backing up the vehicle
- * Neutral - for starting the engine or idling
- * L (Low) - for use when extra pulling power or very low speed is required in rough terrain.
- * H (High) - for general use at normal operating speeds.

Inside the transmission, there is a synchronizer system or clutch brake on the input shaft to allow for easier and more accurate shifts. When you apply force to the shift lever, it is transmitted through push/pull cables to the transmission, where it forces a gear to slide on the input shaft. The movement of the gear on the shaft is restricted by springs and balls within the input shaft so that extra force must be applied, allowing the synchronizer to brake the rotating shaft to a stop. This reduces gear grinding during shifting.

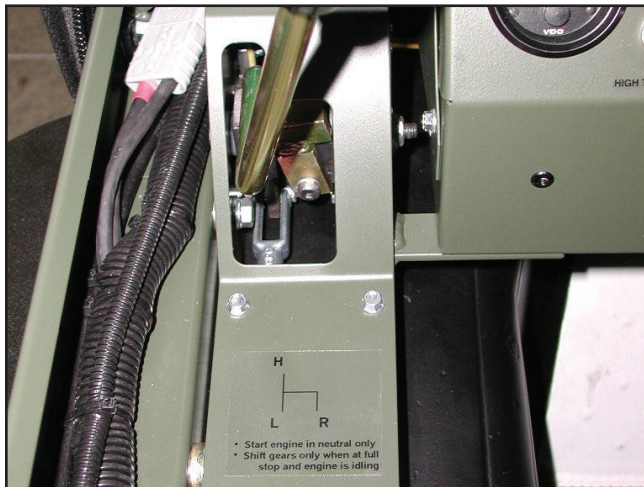


Figure 3-2. Direction of gearshift travel and gear positions.

If the gear does not easily engage, it is possible that the teeth are clashing directly. If this is the case, pushing harder may

not help. The input shaft must be allowed to start turning again and the shift attempt made over.

The shift box is designed to allow one lever to be used to shift both high and low gears and reverse. There is a neutral position in which the lever can be moved side to side. The mechanism inside the transmission does not allow two gears to be engaged at one time. Access to low, high, or reverse is only possible from the neutral position. Shifting works best when the engine is idling. To shift into high gear with engine at idle:

1. Ensure that the lever is in neutral. Pause for a few seconds, and then;
2. Push firmly and quickly into the high gear position.

This works best if the brakes are NOT applied. If this doesn't work, put the lever back into neutral, step on the gas pedal to rev the engine briefly (1500 rpm), let the engine idle down, and then try the shift again. Repeat until it slides into gear.

NOTE

If vehicle shifts hard into high, try shifting first into low, then into high and if the brakes are applied, the vehicle should shift better.

The technique to shift into low gear is identical to shifting into high.

To shift into reverse, move the lever to the right and pull down firmly. Less force is required to shift into reverse. Reverse does not have a synchronizer so it is very important that the engine is idling. If reverse gear does not engage the first time, use the same technique as for shifting into high and low.

CAUTION

Do not attempt to move the gearshift from the neutral starting position until the engine idles down completely. The Centaur is equipped with an automatic clutch that is activated by engine speed. If the engine idle speed is too high, the transmission will grind during gear engagement.

3.8 HEADLIGHTS

The CENTAUR is equipped with 4 headlights that are operated through the dash mounted light switch. To turn the lights on, push the light switch forward and down. The first position turns on two lights with a flood pattern. The second position turns on the other two driving lights in addition to the two flood lights.

SECTION 3

OPERATING INSTRUCTIONS

CAUTION

Do not leave the lights on for any length of time when the engine is not running. Leaving them on will drain the battery.

SECTION 4

DRIVING PROCEDURES

4.1 DRIVING STRAIGHT AHEAD

Ensure the driver's armrest (if equipped) is in the lowered position. Shift the transmission into LOW or HIGH. Press down on the accelerator pedal slowly until the clutch system engages and the vehicle moves forward.

4.2 STOPPING THE VEHICLE

Reduce pressure on the accelerator pedal. Press carefully on the brake pedal.

WARNING

Do not apply brakes abruptly. The brakes are very effective and sudden braking may cause you or your passengers to be thrown from the vehicle and could result in serious injury or death. Never use excessive force on the brake pedal to apply the brakes. This can cause tremendous pressure in the master cylinder and brake caliper, resulting in component failure.

When driving the vehicle, do not "ride" the brakes. Keep your foot off the brake pedal unless you are stopping the vehicle.

4.3 TURNING THE VEHICLE

The Centaur is a skid steer vehicle. The rear of the vehicle swings outward during a turn. Always take precautions when making turns to avoid hitting persons or objects.

The steering system is powered by a hydrostatic transmission and works best when engine r.p.m. is higher than at idle. Avoid turning the steering wheel when engine is idling.

CAUTION

Do not use steering unless vehicle is moving. Damage to the steering system could result.

4.4 BACKING THE VEHICLE UP

With the engine at idle, shift the transmission into reverse. Press on the accelerator pedal slowly until the clutch system engages and the vehicle moves backward. Increase speed by gradually increasing pressure on the accelerator pedal.

4.4.1 Turning The Vehicle While Backing Up

Carefully practice backing up and turning in an open area until you become accustomed to this procedure. Take precautions to avoid hitting persons or objects.

WARNING

When turning in reverse, steering operation is opposite to automobiles, similar to backing up a trailer.

SECTION 5

DRIVING PROCEDURES IN UNUSUAL CONDITIONS

5.1 REMOTE AREA USE

When traveling in remote areas or when traveling long distances, the following items are essential:

- a first aid kit
- a complete survival kit
- protective clothing and footwear
- waterproof safety matches
- candles
- emergency flares
- communications equipment
- adequate fuel supply in approved, watertight containers
- fire extinguisher
- back-up battery
- basic mechanic's tools and Centaur spare parts

Before venturing into remote areas, carry out all inspections, adjustments and lubrication checks detailed in this manual. Do not proceed unless your vehicle is in good working condition.

Inform someone of your departure and return plans and your route so that help can be dispatched if you do not return as scheduled. Do not travel into a remote area alone.

Choose your equipment and supplies to meet the climate and terrain conditions that you may encounter. Practice safe driving habits when traveling in remote areas. Avoid terrain that may be impassable.

5.2 ANGLE OF OPERATION

When operating the CENTAUR on an angle, (up and down hills or across uneven terrain that causes the vehicle to tilt in any direction) the engine and transmission oil levels are affected. If the engine oil level falls below the oil pump intake or if the transmission oil level falls below the hydrostatic transmission intake port, damage will occur because of inadequate lubrication. To avoid premature engine or hydrostatic transmission damage and costly repairs:

- Do not operate your engine continuously on angles or inclines that are greater than 30 degrees in any direction.
- Make sure the engine oil level is near the "full" mark (However, do not overfill.)
- Make sure the transmission oil level is between the two marks on the dipstick.

5.3 UPHILL OPERATION

WARNING

Never accelerate or brake suddenly while driving up or down a hill. Sudden acceleration or braking can cause the vehicle to roll over, causing serious personal injury or death.

Never attempt to turn the vehicle around on a steep hill or grade. Turning the vehicle around on a hill can result in the vehicle rolling over and can result in serious injury or death.

Approach the hill head on to minimize the possibility of sliding sideways or rolling over. Accelerate slowly to prevent loss of traction. When traction is lost, the vehicle may slide sideways or backwards. If this occurs, apply the brakes gently and evenly to stop the slide. Allow the vehicle to coast back down to the bottom of the hill by carefully releasing the brakes.

Try to avoid steep hills. When a steep hill can't be avoided, be prepared to shift cargo forward to prevent the vehicle from rolling over. As a general rule, driving up a steep hill greatly increases the possibility of rolling over.

5.4 DOWNHILL OPERATION

Always approach the hill head on to minimize the possibility of sliding sideways, or rolling over. Do not abruptly or forcefully apply brakes while travelling downhill. Sudden braking can cause the vehicle to roll over frontwards. Use engine braking by selecting low range and keeping the engine speed up just enough to keep the clutch engaged. If engine braking is not sufficient to control downward vehicle speed, then gently apply the brakes with your left foot while maintaining engine speed with your right foot.

Avoid steep declines when possible. When a steep decline cannot be avoided, shift cargo to the rear of the vehicle to prevent the vehicle from rolling over. As a rule, driving the vehicle down a steep decline greatly increases the possibility of rolling over.

5.5 SIDE SLOPE OPERATION

Do not drive your vehicle across the side of a hill. Side slope operation greatly increases the risk of rolling the vehicle over sideways.

Prolonged side slope operation may cause engine damage. Observe the engine angle of operation limitations in Section 5.2.

SECTION 5

DRIVING PROCEDURES IN UNUSUAL CONDITIONS

5.6 WATER CROSSING - GENERAL

⚠ WARNING

The CENTAUR will sink if filled with water. If water starts entering the vehicle, head to the nearest shore immediately. Be prepared to abandon the vehicle if it appears that the vehicle will fill with water before you reach the shore. Be especially cautious when operating a loaded vehicle (cargo and/or passengers) when crossing water. Observe the capacity limits.

The Centaur vehicle is a land vehicle, capable of crossing rivers, streams and swamps to a depth of 25 inches (635 mm), provided that the following precautions are observed:

1. Using the Centaur as an amphibious vehicle is not recommended. Cross shallow streams and rivers only.
2. Do not enter water if the vehicle is overloaded. Refer to Section 1.4 of this manual for recommended load capacity.
3. Do not use seat belts or any passenger restraining device while crossing shallow water. If an emergency arises, you and your passengers may have to leave the vehicle quickly.
4. Never attempt to cross large bodies of water.
5. Never attempt to navigate any body of water with a strong current.
6. Use extra caution when crossing cold water. Exposure to cold water significantly reduces the chance of survival.
7. Care must be taken when encountering submerged obstacles that may upset the vehicle.

Observe the following safety precautions BEFORE entering the water:

1. All occupants must wear an approved personal flotation device (PFD) or life jacket while crossing water.
2. Equip the vehicle with first aid kits and personal safety equipment. Optional bilge pump kits (Part No. 849-146) are available from your Centaur dealer and are recommended for vehicles that will be crossing shallow streams or rivers.
3. Make sure both drain plugs in the rear of the lower body (Figure 5-1) are in place and properly tightened. To

install, locate the drain plugs at the rear of the vehicle and thread each drain plug in a clockwise direction into the plug fitting ensuring a snug fit. Check the O-ring on drain plug periodically. When removed, each drain plug remains attached to the hole opening to prevent loss or misplacement of the plug while the vehicle is draining. (Figure 5-2).



Figure 5-1. Location of the drain plugs.



Figure 5-2. Removing and installing the drain plugs.

4. Visually check the lower body of the vehicle for cuts, punctures or holes that will allow water to enter the vehicle.
5. Make sure that any cargo in the rear of the vehicle is evenly distributed and properly balanced.
6. Periodically inspect the fit of the axle housings to the lower body to ensure they are water tight. If there are signs of water leaking into the lower body, take corrective action before crossing shallow water again.

NOTE

Always observe the recognized rules of boating while traveling in water.

SECTION 5

DRIVING PROCEDURES IN UNUSUAL CONDITIONS

5.6.1 Entering the Water

The point of entry should be free of rocks, stumps and other obstacles. Enter the water from a firm, gradual slope whenever possible. With the wheels partially submerged but still in contact with the bottom, stop and check thoroughly for water entering the lower body.

If a leak is detected, drive back onto shore. Drain the vehicle and repair the leak before re-entering the water.

5.6.2 Driving Procedures in Shallow Water

Avoid rocks, stumps or other obstacles that are below the surface of the water. Striking these obstacles may damage the bottom or upset the vehicle.

If your vehicle begins to fill with water, immediately head to the nearest shore. Get the vehicle out of the water and drain it by removing both rear drain plugs. Correct the leak before crossing the water again.

CAUTION

Do not leave the vehicle in water for extended periods of time. Water could enter the axle seals or lower body and cause damage to the axle bearings, chains or sprockets.

5.6.3 Driving Out of Water

When driving out of water, choose an area of the shore that is reasonably flat and free of rocks, stumps and other obstacles. Steer the vehicle so that both front wheels reach the shore at the same time. Accelerate slowly until the vehicle is out of the water.

5.7 WINTER OPERATION

Follow these precautions when operating the Centaur in winter conditions:

- Equip the vehicle for remote area use, as listed in Section 5.1.
- Keep the battery fully charged and in good condition.
- Use the recommended winter grade of engine oil.
- Do not allow water or snow to accumulate in the vehicle. Snow may melt during operation of the vehicle, collect in the lower body and freeze around the chains and final drive components, immobilizing the vehicle.
- Store the vehicle indoors or under cover.
- Equip your vehicle with snow tracks for travel over deep snow.

- Steep, snow-covered or icy hills may be more difficult to ascend or descend.
- Never travel alone into a remote area. Leave your route and arrival plans with someone who can send help if you fail to arrive as planned.

5.7.1 Use on Ice Covered Bodies of Water

WARNING

Using the CENTAUR on ice-covered bodies of water is potentially hazardous. Use extreme caution. Exposure to cold water reduces a person's chance of survival. Protective clothing, such as a marine survival suit will significantly decrease the effect of exposure in frigid water should the vehicle break through the ice and capsize.

Before venturing out onto ice-covered bodies of water, it is extremely important to:

- Check the ice thickness and condition to be sure it will support the vehicle.
- Take all precautions as in Section 5.6, particularly paragraph 3 referring to drain plugs.
- Take along a cellular telephone or similar device to call for help in case of emergency.

If the vehicle breaks through the ice, it may float in the water, provided that there are no leaks in the body, the drain plugs are in place and vehicle is not taking on water through any body openings. However, there is a risk of the vehicle tipping, particularly if the load is unbalanced. Be prepared to shift occupants' weight for balance.

Getting back onto safe ice is virtually impossible! Be prepared to call for assistance and help.

Stay put and await rescue. This may be safer than trying to leave the vehicle to walk over thin ice.

SECTION 6

OIL, FILTER AND LUBRICATION INFORMATION

6.1 ENGINE OIL INFORMATION

⚠ WARNING

Detailed information on standard workshop and safety procedures and general installation practices is not included in this manual. ODG assumes no responsibility or liability for PERSONAL INJURY or VEHICLE DAMAGE which results from any procedure performed, including those procedures outlined here. Before performing any procedure, an individual must have determined to his/her satisfaction that personal injury or vehicle damage will not result from the procedure, working environment or tools selected.

6.1.1 Checking the Engine Oil Level

Check the engine oil level each day before operating the engine.

To check the oil during an operating period, shut the engine off, let it cool down and allow the oil time to drain into the sump before checking the oil level. Position the vehicle so the engine is level.

The BRIGGS & STRATTON DAIHATSU engine (Figure 6-1) is equipped with a dipstick and a separate oil filler cap. To check the oil level, clean the area around the dipstick before removing. Remove the dipstick and wipe it with a clean cloth. Re-insert the dipstick and push it all the way into the tube. Remove the dipstick and check the oil level. The oil level should be between the marks. If the level has dropped, add oil to bring the level up to the “F” mark. DO NOT OVERFILL.

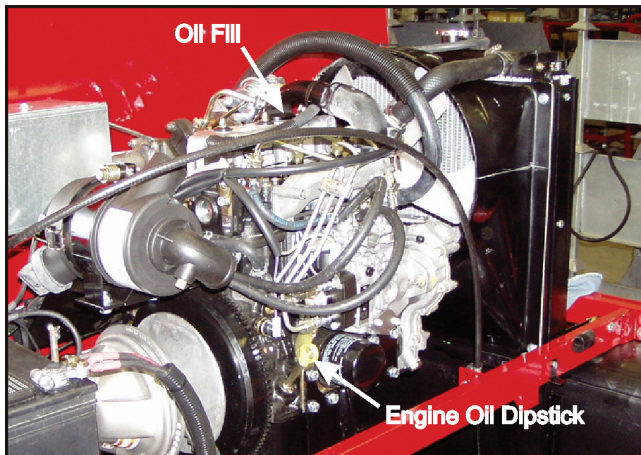


Figure 6-1. Oil fill and level location
Briggs & Stratton Daihatsu engine

⚠ CAUTION

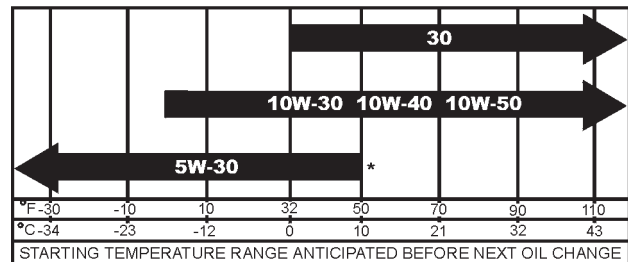
Do not run the engine if the oil level is above the “F” mark or below the “L” mark. Premature engine damage or total engine failure can occur when the oil level is not properly maintained.

6.1.2 Recommended Engine Oil

Use a high quality detergent oil of API (American Petroleum Institute) service class as listed below. Choose the correct viscosity of oil for seasonal driving conditions. For the gasoline powered Centaur, use API service class “SH” or “SJ” or higher. For diesel powered Centaur use API service class “CF” or “CF-4”.

Oil capacity is approximately 3.3 litres, including the oil filter.

SAE Viscosity Grades



* A synthetic 5W-30 oil may be used.

6.1.3 Changing Engine Oil

During the initial engine break-in period, change the oil after the first 25 hours of operation. After the break-in period, change the engine oil every 150 operating hours, or more frequently if the vehicle is operated in dusty or dirty conditions.

Draining the Engine Oil

Each engine is equipped with a drain plug for draining the oil. The drain plug location is shown in the engine owner's manual. Drain the oil from the engine as follows:

1. Start and warm up the engine so the oil will drain easily.
2. Level the vehicle so the oil will drain completely.
3. Place a suitable container under oil drain of engine and remove drain plug with a wrench.

SECTION 6

OIL, FILTER AND LUBRICATION INFORMATION

NOTE

There is limited space between the engine and transmission. Cut down an empty plastic container to the correct height so it will fit under the engine oil drain. Make sure the container will hold the amount of oil in the engine.

A ziploc plastic bag makes a convenient oil container. It conforms to the space available and can be closed securely when the oil is drained, then lifted neatly out of the engine compartment.

PLEASE DISPOSE OF WASTE OIL PROPERLY TO CONSERVE OUR ENVIRONMENT.

- When all the oil has been drained from the engine, clean and replace the drain plug. **MAKE SURE** it is properly tightened before refilling the engine.
- See Oil Filter Replacement in Section 6.3.3.

Refilling the Engine

Refill the engine through the oil fill with the correct amount and grade of oil as indicated in Section 6.1.2. As you add oil, frequently check the level with the dipstick. Do not overfill. Start engine. Check for leaks. Stop the engine. Check the oil level. Add oil only to the “F” mark on the dipstick.

6.2 TRANSMISSION OIL INFORMATION

6.2.1 Checking the Transmission Oil Level

Check the transmission oil level each day before operating the Centaur. The Centaur is equipped with a transmission oil dipstick (Figure 6-2). Position the vehicle so the transmission is level. Clean the area around the dipstick before removing. Remove the dipstick by pulling up.

The transmission oil level should be even with the mark on the dipstick as shown in Figure 6-3. Add Citgo Transguard Tractor Hydraulic Fluid (or equivalent) through the transmission oil fill/dipstick hole until the transmission is filled to the correct level. When the oil level is at the lower notch, approximately one litre can be added. **DO NOT OVERFILL.** Replace the dipstick securely.

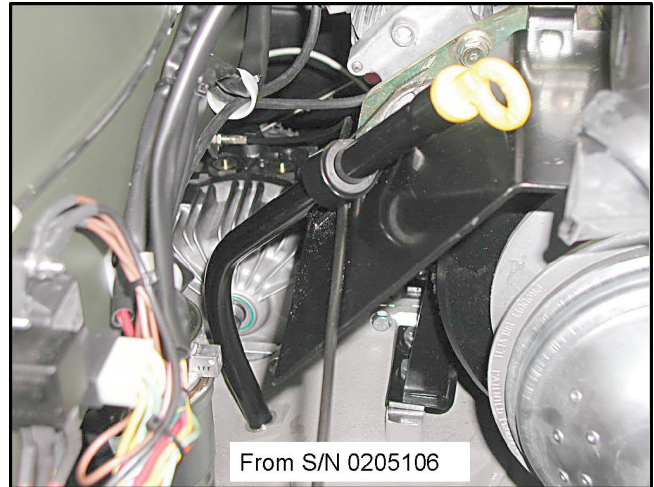


Figure 6-2. Location of Transmission Dipstick

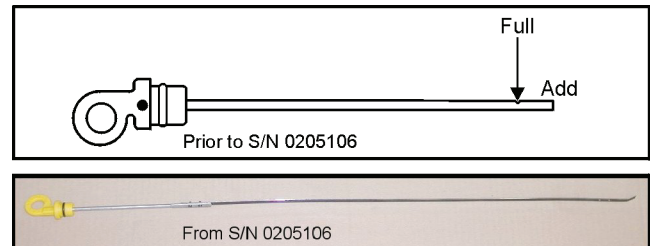


Figure 6-3. Transmission Dipstick

6.2.2 Changing the Transmission Oil

Change the transmission oil after the first 25 hours of operation. After this, change the transmission oil every 150 operating hours. Drain the transmission oil using an oil change pump accessory (Part No. 638-02) by drawing the oil through the oil fill/dipstick hole. Dispose of the oil at a disposal site.

Refilling the Transmission

Refill the transmission through the oil fill/dipstick hole with 12 L of Citgo Transguard Tractor Hydraulic Fluid (or equivalent). Alternately, Mobil Delvac 1, 5W30 synthetic oil may be used, especially if operating the Centaur under extreme cold or hot weather conditions; this Mobil oil may be used in the engine also. Start the engine and run for a minute to fill the oil filter and hydrostatic transmission. Check that the oil level is even with the mark on the dipstick, after it has been seated fully in the dipstick hole. **DO NOT OVERFILL.**

6.3 FILTER INFORMATION

6.3.1 Air Filter

The Centaur is equipped with a filter element housed in an air cleaner assembly located above the clutch.

SECTION 6

OIL, FILTER AND LUBRICATION INFORMATION

Check the paper air filter element every 100 hours of operation or more often under extremely dusty, dirty or wet conditions.

For instructions to remove, clean and replace the air filter components, refer to the air cleaner section of the engine owner's manual.

6.3.2 Fuel Filter

950DT and 954DT

The diesel powered Centaur is equipped with a fuel filter assembly comprised of a replaceable element, water separator bowl, and water level sensor.

If the fuel filter warning light comes on while engine is running, stop engine and drain water from fuel filter.

1. Stop engine.
2. Place a drain pan under fuel filter and loosen drain plug approximately 1 turn.
3. Water should drain. If necessary, operate priming pump to drain water, but only until fuel flows from filter.

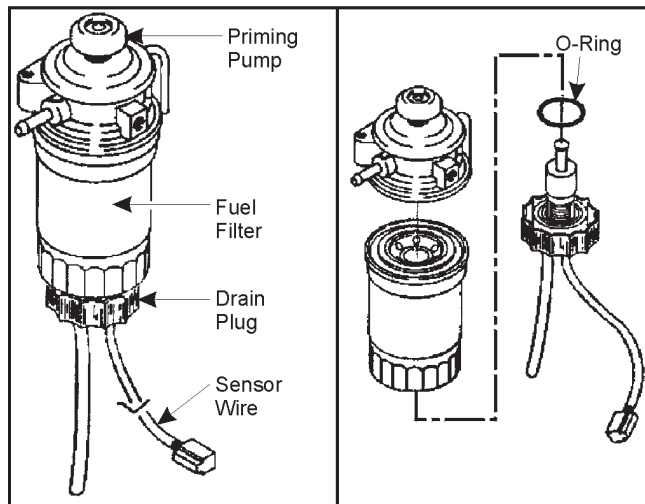


Figure 6-4. Fuel Filter

4. Tighten drain plug. Bleed air from fuel line.
5. Start engine. Make sure warning light goes out. Check for leaks.

To replace fuel filter element:

1. Disconnect sensor wire. Remove drain plug and discard O-ring.
2. Remove fuel filter with filter wrench.
3. Screw new filter on by hand until gasket contacts housing. Then tighten 1/3 turn more.

4. Install drain plug with new O-ring. Connect sensor wire.
5. Bleed air from fuel line. Start engine and check for leaks.

! CAUTION

Do not operate the fuel injector pump dry. Ensure the pump is primed with fuel before starting to prevent damage to the pump.

6.3.3 Engine Oil Filter

During the initial engine break-in period, change the oil filter (Part No. 126-95 for gas engines & No. 820314 for diesel) when the oil is changed. After that, change the oil filter every 300 hours.

Before installing the new filter, lubricate the rubber filter gasket with fresh oil. Screw the filter on by hand until the gasket contacts filter adapter. Tighten 1/2 to 3/4 turn more. Start and run engine to check for oil leaks. Stop engine and re-check oil level. Add oil if required.

6.3.4 Transmission Oil Filter

The hydrostatic transmission is equipped with a disposable, spin-on oil filter. Replace this filter with a new one whenever transmission oil is changed (Part # 610-114).

Before installing the new filter, lubricate the rubber filter gasket with fresh oil. Screw the filter on by hand until the gasket contacts filter adapter. Tighten 1/2 to 3/4 turn more. Start and run engine to check for oil leaks. Stop engine and re-check oil level. Add oil if required.

6.4 LUBRICATION INFORMATION

6.4.1 General

The drive chains require regularly scheduled lubrication to prevent premature wear and replacement. Use the recommended lubricants listed in this section and carefully observe the recommended lubrication intervals.

6.4.2 Drive Chain Lubrication

Your Centaur is equipped with an auto lube system, Figure 6-4a, which provides lubrication to the Centaur drive chains at each axle. This requires maintaining the oil level in the system on a regular basis.

SECTION 6

OIL, FILTER AND LUBRICATION INFORMATION

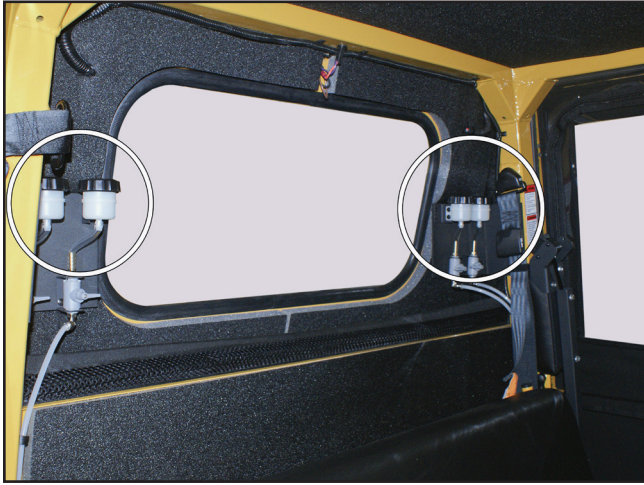


Figure 6-4a. Auto lube system.

Recommended Chain Lube Oil

BEL-RAY® WATERPROOF CHAIN LUBRICANT

Bel-Ray Waterproof Chain Lubricant is a heavy-duty, long lasting oil for chains and bearings operating in wet environments. It offers exceptional rust and corrosion protection, as well as water displacing benefits that make it the ideal lubricant for numerous wet applications.

P.O. Box 526
Farmingdale, New Jersey 07727 U.S.A.
TEL (732) 938-2421 FAX (732) 938-4232
www.belray.com

An alternative to the above if not readily available is any oil - ATF, light Hyd oil etc. or for the environmentally conscious, use **Husqvarna VegOil**. A vegetable-based chain oil that has been carefully developed by Husqvarna to produce a highly effective, environmentally compatible lubricant. Biodegradable and economical – up to 40% less required than with conventional oils. Low viscosity even in extreme cold and able to handle water contamination. Can be cleaned with common detergents.

After every 100 hours of operation, remove all the drive chains from the vehicle and clean them thoroughly in a suitable solvent, i.e. degreaser.

⚠ WARNING

Never use gasoline as a cleaning solvent. Gasoline is extremely flammable and can explode if ignited, causing serious personal injury.

Allow the chains to dry thoroughly, re-lubricate generously with Chain Lube and re-install.

Refer to Section 7.2.3 of this manual for drive chain removal and re-installation instructions.

6.4.3 Driven Clutch Maintenance

The driven clutch uses dry slide bushings and should **not** be lubricated. A complete service of the clutch units is required after every 300 hours of operation. To perform this procedure, the clutches must be disassembled. Special tools are required to disassemble the clutch units. We recommend that you return your vehicle to a Centaur dealer to have the clutch units serviced.

6.4.4 Axle Bearing Lubrication

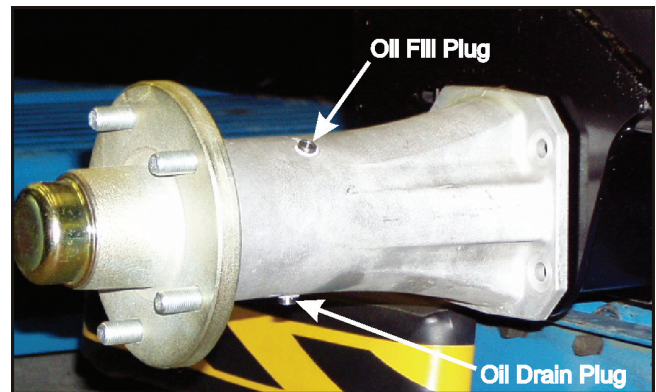


Figure 6-5. Axle Assemblies

The Centaur axle assemblies are filled with 300ml of 80W90 Gear Lube HYP0Y-C. At 25 hours:

1. The oil level should be checked by removing the side plug on each axle housing. Fill the axle assembly until the oil is level with this hole.
2. The bottom plug should be removed to check for water contamination. If water runs out or the oil has a milky appearance, drain the oil and replace with 300 mL (10.2 ozs.) of 80W90 Gear Lube HYP0Y-C.

The oil in the axle housings should be replaced each 150 hours of operation.

SECTION 7

MAINTENANCE INFORMATION

7.1 ELECTRICAL SYSTEM

⚠ WARNING

Detailed information on standard workshop and safety procedures and general installation practices is not included here. ODG assumes no responsibility or liability for PERSONAL INJURY or VEHICLE DAMAGE which results from any procedure performed, including those procedures outlined here. Before performing any procedure, an individual must have determined to his/her satisfaction that personal injury or vehicle damage will not result from the procedure, working environment or tools selected.

7.1.1 General

To prevent damage to the electrical system:

- Never weld on the vehicle without first disconnecting both positive and negative battery cables. Make sure the part you are welding is properly grounded.
- Connect battery booster cables properly, positive to positive and negative to negative. Connect negative cable last, disconnect first.
- Connect switch terminals properly, especially the ground wire.

7.1.2 Battery - 613-101- Exide - 613-160 - Optima

⚠ WARNING

Battery fluid contains sulphuric acid. If battery fluid comes in contact with skin or eyes, flush thoroughly with water. If swallowed, call physician or poison control centre immediately. KEEP AWAY FROM CHILDREN. Serious personal injury can occur. Always wear rubber gloves and safety glasses when servicing the battery.

Batteries can explode and cause serious personal injury if exposed to flame or sparks. Never smoke while servicing the battery.

All models are equipped with a 12 volt, wet cell type battery. The battery is located in the engine compartment, on the left side of the engine.

Checking Fluid Level (All vehicles except those with Optima Battery (sealed))

Check the fluid level every 50 hours of operation. Remove the vents and make sure each cell is filled to the fluid level as shown in Figure 7-1. If the fluid has dropped below the fill

well, add distilled water until the cell is filled to correct level. DO NOT OVERFILL

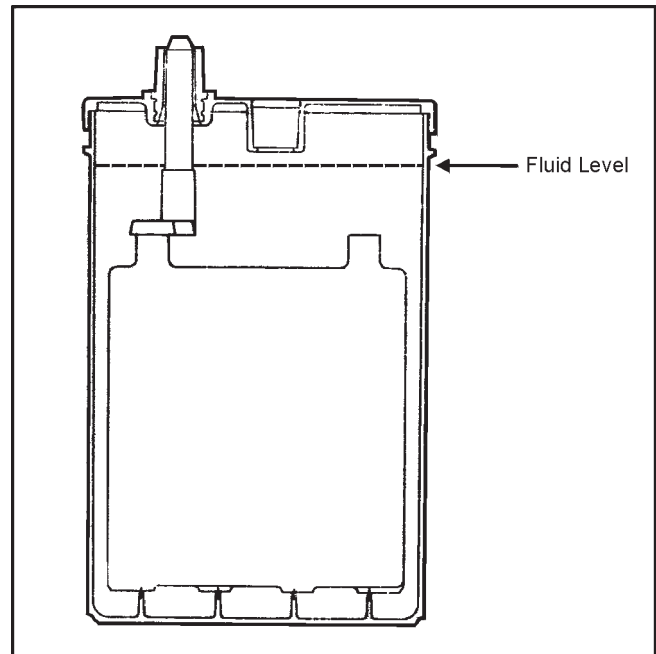


Figure 7-1. Battery Fluid Level

Charging the Battery - Exide

If the battery loses its electrical charge, remove the battery from the Centaur and recharge it with a 12 volt battery charger at the rate of 10-12 amps maximum. The battery should remain on charge until the specific gravity reaches 1.265 on a hydrometer. Re-install the battery in the vehicle and try to start the engine. If the battery fails to perform properly, have it tested by a battery service dealer. Replace a defective battery with Part No. 613-101.

Charging and Testing the Battery - Optima

The following process has been recommended by OPTIMA Batteries to support your charging concerns about this unique product. Note that steps 3D and 4B can help you minimize your recharge requirements and prevent unnecessary recharge effort.

STEP 1 Check the appearance of the battery. If there is any physical damage or alteration to the battery — holes in case / cover or post alteration, missing flame arrestor disc(s)/ vent/valves — do not charge the battery. Batteries are not eligible for warranty with these conditions.

STEP 2 Check the Open Circuit Voltage (OCV) of the battery to determine its state of charge.

STEP 3 OPTIMA battery technology will allow discharging a 12V battery below the normal 10.5 volts without sig-

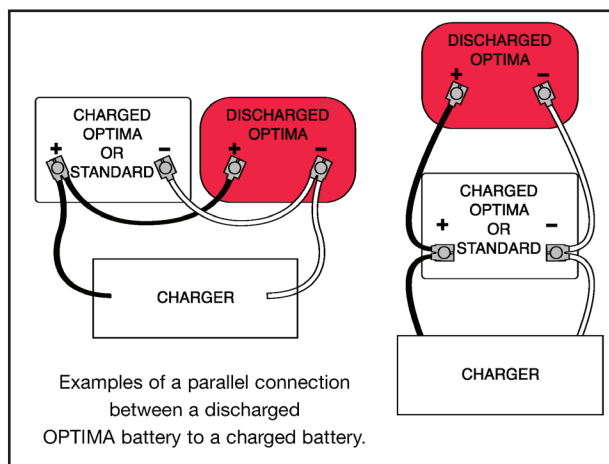
SECTION 7

MAINTENANCE INFORMATION

nificant decreases in performance. However, the design of many standard constant-voltage chargers may not permit it to recognize a battery with a voltage below 10.5 volts.

If the OCV is less than 10.5 volts, take the following steps to get the OPTIMA battery to accept a charge:

- A** Begin the process by connecting a good battery to the charger.
- B** Connect the discharged OPTIMA battery (below 10.5 volts OCV) in a parallel connection with the good battery as shown. Turn the charger on.
- C** If the discharged OPTIMA battery voltage increases to 10.5 volts or higher, remove it from the parallel connection and go to step 4 (charging/testing).
- D** If the OPTIMA battery voltage does not increase within one hour, fail the battery.
The RBR (Return Battery Report) can include the description “Failed Step 3D” as reason for warranty return.



STEP 4 If the OCV is between 10.5 and 12.55, connect the battery to a constant-voltage charger, such as a (1) parallel charger or (2) single battery 5/15/50-type roll-around shop charger for no more than 5 minutes to see if it accepts a charge.

- A** If it accepts equal to or greater than 5 amps, follow the “constant charge” or “constant current” charging recommendations below or those on the Interstate “Approximate Charge Times · Key Shop Procedures” chart.
- B** If it does not accept 5 amps, do not charge the battery. Fail the battery based on this test.
The RBR can include the description “Failed Step 4B” as reason for warranty return.

CONSTANT VOLTAGE common to most single battery chargers, parallel chargers and consumer chargers										
	Auto/Marine Starting Battery				Deep Cycle/Commercial Battery					
Tested OCV	<12.00		12.01 to 12.55		<12.15			12.16 to 12.55		
Current (amps)	5		5		5			5		
Current Limit (amps) (3-amp avg. over time)	5-10		5-10		5-10			5-10		
Amp-Hour Capacity	44	50	44	50	41	55	75	41	55	75
Time (hours)	10	12	6	7	10	13	18	5	7	10

Current will drop as battery becomes fully charged.

CONSTANT CURRENT <small>this includes series connected batteries on multiple battery chargers</small>										
	Auto/Marine Starting Battery					Deep Cycle/Commercial Battery				
Tested OCV	<12.00		12.01 to 12.55			<12.15			12.16 to 12.55	
Current (amps)	5		5			5			5	
Amp-Hour Capacity	44	50	44	50	41	55	75	41	55	75
Time (hours)	6	7	4	4	6	8	11	3	4	6

With constant current charging, a battery voltage should not be permitted to go above 16.0 volts.

After the battery is fully charged, go to Step 5 to load test the battery.

Note:

- 12V batteries received at severely low voltages of less than 8 volts may require 50% longer charging times (50% more Amp-Hour input).
- During the charge process, batteries that are hot to the touch (>120°F) should be removed from charge. If this occurs on a series charger, the 12V battery may have a terminal voltage greater than 16 volts.

If it occurs on a constant voltage charger, fail the battery.

STEP 5 If the OCV is 12.55 volts or higher, load test the battery following Battery Council International (BCI) load procedure. (A load test @ 1/2 the CCA for 15 sec is required to pass or fail the battery for warranty consideration.)

⚠ WARNING

Ventilate area when charging. Keep away from spark, heat, cigarettes or open flame.

Cleaning the Battery Terminals and Cable Connections

Clean the battery terminals and cable connections every 100 hours. Remove the black NEGATIVE (-) cables first. Make sure you reconnect the NEGATIVE (-) cables to the NEGATIVE (-) post and the red POSITIVE (+) cables to the POSITIVE (+) posts. Damage to the electrical system will occur if the cables are reversed.

Cleaning the Battery

Clean the top of the battery every 300 hours with a mixture of baking soda and water. Before cleaning the battery, remove it from the vehicle and make sure the vents are in place. Soak a cloth in the soda/water mixture and scrub the top of the battery. After the foaming has stopped, flush with clean water and dry with a clean cloth.

SECTION 7

MAINTENANCE INFORMATION

7.1.3 ELECTRICAL SYSTEM FUSES

The Centaur is equipped with push-in type automotive fuses. The fuses protect the electrical circuits of the vehicle. They are located in the fuse block, under the dash. Replace any blown fuses. Return your vehicle to a Centaur dealer for inspection of the electrical circuit if a fuse blows repeatedly.

7.2 DRIVE SYSTEM & TIRES

⚠ WARNING

Do not attempt to adjust, repair or replace the drive belt, clutches or any moving part while the engine is running. Before servicing the vehicle, disconnect the battery to prevent accidentally starting the engine.

Keep the engine cover and clutch guard securely in place when the engine is running. Severe injury can result if the drive belt, clutch components or other moving parts come loose.

If engine compartment inspection is necessary while the engine is running, use EXTREME CAUTION! Keep engine RPM low. Avoid standing directly in line with moving components. Use a mirror to view the components.

7.2.1 DRIVE BELT

The drive belt transmits power from the driver clutch (on the engine) to the driven clutch (on the transmission). These components are located on the left side of the engine compartment.

Check the drive belt after every 25 hours of operation, or whenever there is a noticeable reduction in clutch performance. Replace the belt with Part No. 610-119 for Centaur 31 DT and Part No. 610-119SA for Centaur 34 DT when:

- the top width of the belt has worn to 1-1/16" (27mm)
- cracks, fraying or shredding is apparent
- it becomes contaminated with oil or some other fluid

To Remove the Drive Belt:

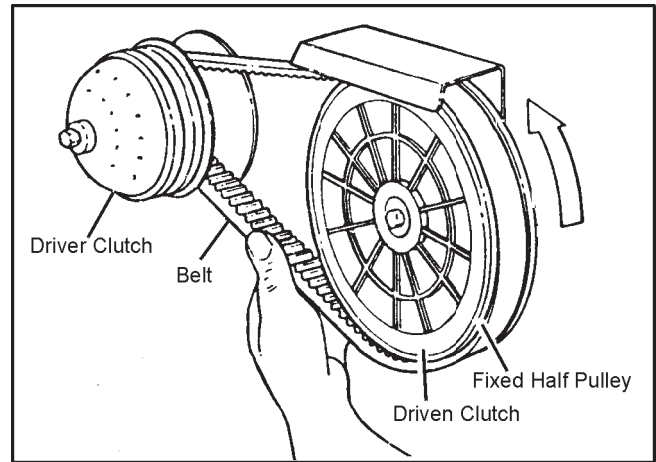


Figure 7-2. Removing the drive belt

1. Make sure ignition is turned off.
2. Remove the engine cover.
3. Place the transmission in N (neutral).
4. Ease the belt over the fixed half pulley of the driven clutch starting from the bottom of the clutch, while turning the clutch counterclockwise until the belt is off (Figure 7-2).
5. Remove the belt from the driver clutch.

To Install the Drive Belt:

⚠ CAUTION

If this procedure is not carried out as described, the edge of the fixed face may cut or damage the drive belt.

1. Position the belt around the driver clutch first.
2. Ease the belt over the edge of the fixed face on the driven clutch and at the same time, turn the inside, moveable face clockwise.

Drive Belt alignment and tension are pre-set at the factory and are not adjustable. They are critical for proper operation of the drive system. Return the vehicle to a CENTAUR dealer if rapid belt wear occurs.

SECTION 7

MAINTENANCE INFORMATION

7.2.2 CLUTCH MAINTENANCE

Disassembly and repair of the driver and driven clutch requires special tools. Return the vehicle to a CENTAUR dealer if the clutch units need servicing. The following indicates that clutch service is required:

- a drop in vehicle performance
- the clutch does not shift smoothly
- the clutch sticks during vehicle operation
- the drive belt wears rapidly
- the vehicle vibrates severely during operation
- the vehicle does not accelerate when the engine speed is increased with the transmission in gear
- transmission will not shift smoothly into gear at engine idle

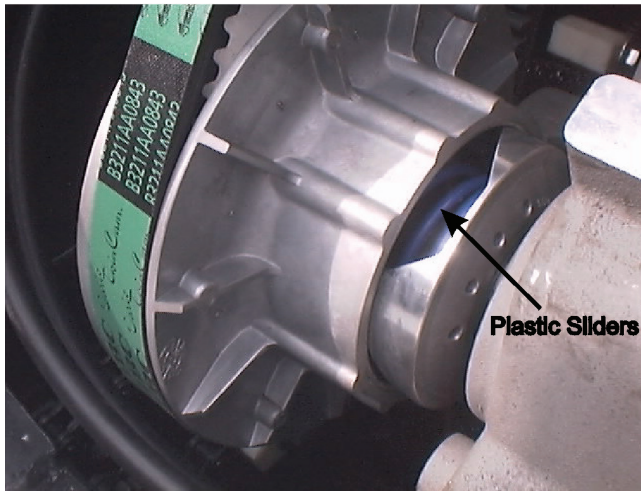


Figure 7-3. Location of the Sliders

Clutch Inspection

Lubrication of the clutch parts is not required. Do not lubricate the driven clutch.

Inspect the plastic sliders every 50 hours. The plastic sliders are mounted in the driven clutch moveable pulley. (Figure 7-3). When the clutch shifts, the cam moves on the nylon sliders. Replace the plastic sliders *before* there is aluminum to aluminum contact between the cam and the movable pulley. Driven clutch disassembly is required to replace the nylon sliders properly. Return the vehicle to a CENTAUR dealer for service.

7.2.3 DRIVE CHAINS

Roller chain “stretch” results from wear to the chain pins and bushings because of the loss of lubricant. Roller chain stretch is normal and expected. Chain stretch is accelerated from lack of proper / routine lubrication.

To prevent sprocket damage and unnecessary breakdowns, replace the chains when:

- the chain tensioner can no longer take up the chain slack.
- the chain is seized due to rust and lack of lubrication.
- the chain climbs the sprocket teeth, especially noticeable when turning.

To Remove the Drive Chains:

1. Place the gearshift in the neutral position.
2. Remove the floor pans.
3. Remove the chain tensioner torsion springs.
4. Roll the vehicle until the connecting link on one of the chains is visible.
5. Remove the cotter pins from the connecting link. Remove the outside plate and tap out the connecting link.
6. Remove the chain from the vehicle.
7. Repeat steps 3 to 6 until all drive chains are removed.

To Install the Drive Chains:

1. Feed the chain around each sprocket and clamp the free end with a modified vice grip (ODG part # 658-38). Figure 7-4.
2. Install the connecting link (from the outside in) and cotter pins, orienting and bending the cotter pins as shown in Figure 7-5.

NOTE

Use a pair of modified 10R Vice Grips to hold the ends of the chain together while inserting the connecting link. Some drive chains have no slack, and replacement of the connecting link is difficult without this tool. Modified Vice Grips can be ordered from your CENTAUR dealer (Part No. 658-38) or refer to Appendix 1 for modification information.

SECTION 7

MAINTENANCE INFORMATION

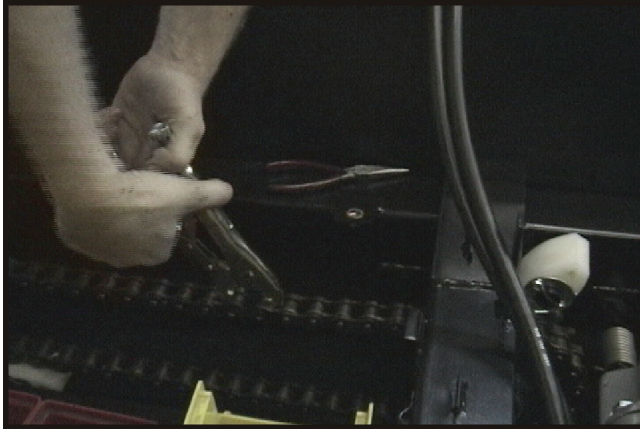


Figure 7-4. Holding chain together to insert connecting link

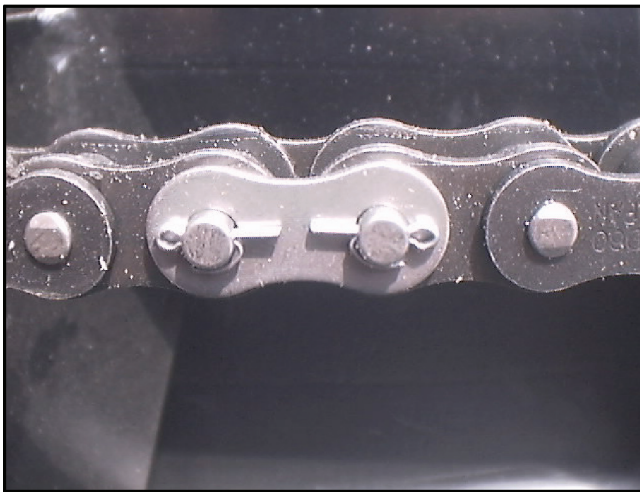


Figure 7-5. Chain connection link components.

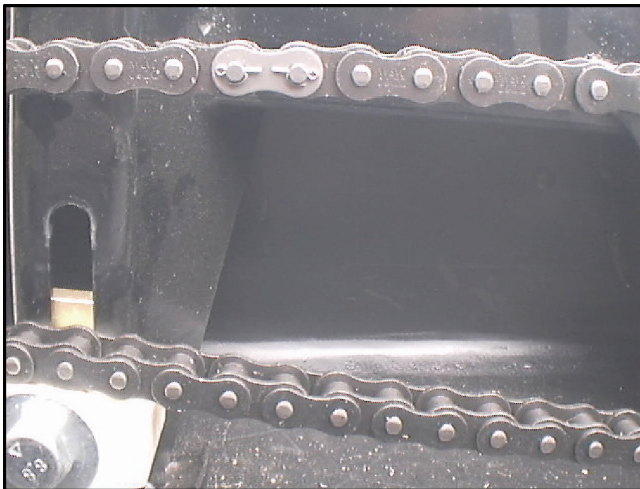


Figure 7-6. Installing the connecting link.

3. Replace the outside plate and cotter pins. Always use new cotter pins. Bend the pins towards the inside of the loop of chain.

4. Repeat steps 1 to 3 until all chains are replaced.

7.2.4 TO REPLACE A SLIDER BLOCK

1. Remove the floor pans.
2. Pull up on the tensioner arm until slider block is not contacting chain.
3. Pop the slider block off the shaft of the chain tensioner arm. Figure 7-7.

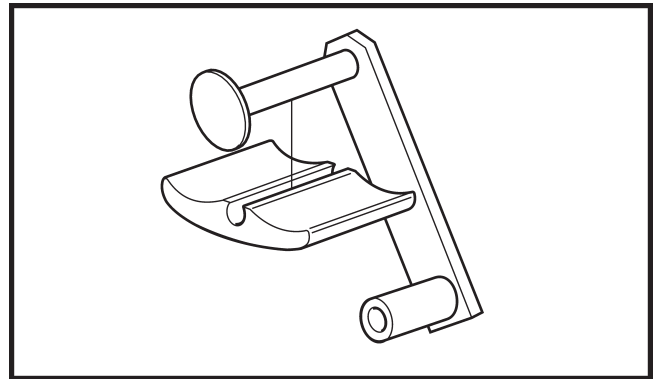


Figure 7-7. Chain tensioner components.

4. Snap the new slider block on to the shaft of the chain tensioner arm.
5. Replace the floor pans.

7.2.5 TIRE REPAIR AND REPLACEMENT

Repair a flat tire by removing the tire completely from the rim. Proper tire changing equipment is necessary to remove and remount the tire. Apply a radial tire patch on the inside of the tire over the puncture or hole.

Remount the tire on the rim using **ONLY WATER** as a bead lubricant. Spoon the tire onto the rim to prevent tire bead area damage. **THE TIRE MAY EXPLODE IF OVER-INFLATED.** Place the tire and rim assembly in a protective cage to inflate and to seat the beads. Never inflate over 32 psi (220 kPa) to seat the bead. Once both beads are seated, deflate to 3.5 psi (24 kPa), 5 psi (34.5 kPa) maximum operating pressure. A special, low pressure tire gauge (Part No. 619-10) is available from your CENTAUR dealer.

Replace badly worn or damaged tires with original equipment Argo HEAT tires. Consult your CENTAUR dealer if in doubt. Any other tires (size, type or tread pattern), will affect the skid steering characteristics of the vehicle.

SECTION 7 MAINTENANCE INFORMATION

7.3 MECHANICAL PARKING/EMERGENCY BRAKE

7.3.1 GENERAL

Periodic inspection and adjustment of the parking/emergency brake system is required to maintain performance.

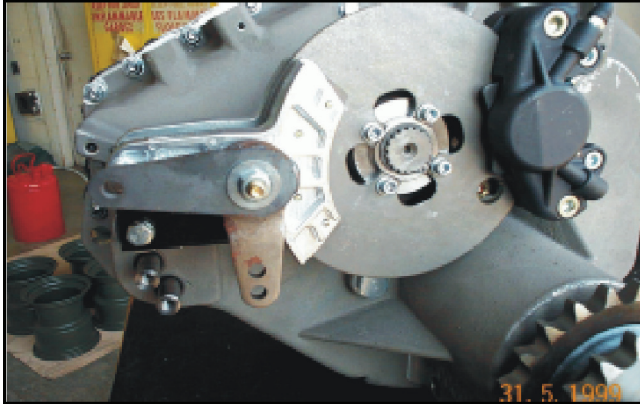


Figure 7-11. Mechanical parking/emergency brake

7.3.2 BRAKE CALIPER ADJUSTMENT

With the engine cover and transmission cover removed, inspect the mechanical brake caliper assembly.

Adjust the calipers when:

- the brake adjustment nuts are tightened all the way but the parking brake cannot be firmly engaged using the parking brake lever, or
- the total clearance between the brake pads and the brake disc exceeds .010".

To adjust the brake caliper:

1. Tighten the lock nut with a 1/2" open end wrench, no wider than the thickness of the lock nut (Figure 7-12). As the lock nut is tightened, measure the clearance between the brake disc and pad as shown in Figure 7-13, using a .010" feeler gauge. .010" is the correct clearance between the left brake pad and the brake disc when the right pad is pressed against the disc.
2. Use another 1/2" open wrench to tighten the outer lock nut to the inner one.
3. Tighten the adjustment lock nut with a 1/2" wrench so it is snug but the bolt can still be turned freely with fingers.

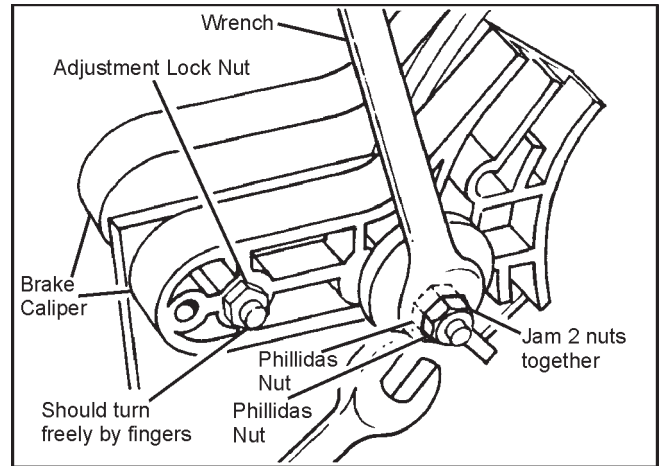


Figure 7-12. Tightening the lock nut.

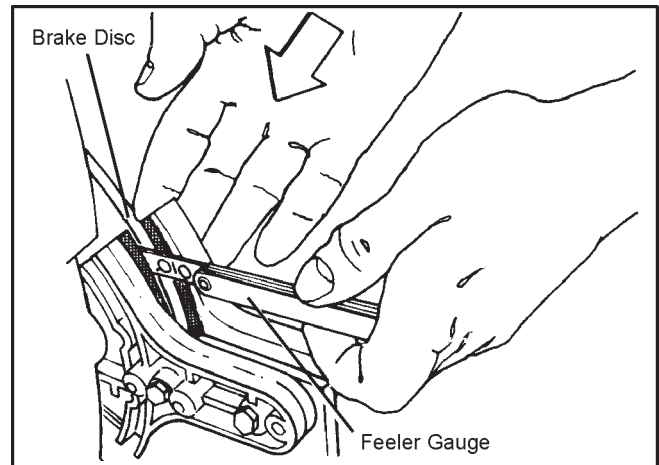


Figure 7-13. Brake pad wear, mechanical brakes.

7.3.3 BRAKE PAD REPLACEMENT

During the inspection of the brake pads, if they are:

- worn to 3 mm (1/8") thickness as shown in Figure 7-14;
- glazed and brake efficiency is affected; or
- contaminated with lubricant and brake performance is affected;

they are no longer serviceable and must be replaced.

To replace the brake pads:

Use an electric drill and 1/4" drill bit to remove the heads of the rivets holding the old pads to the calipers. Clear the remainder of the rivets from the calipers and install 100-56 brake pad set (2 pads) using 8 of 120-09 rivets and a pop riveting tool to fasten the pad in place. A CENTAUR dealer will replace brake pads for you.