

2007
W SERIES CHASSIS
SERVICE MANUAL
INTRODUCTION



A NEW BREED.

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GENERAL INFORMATION

OBJECTIVES OF THIS SECTION

This section is intended to provide information regarding the safety warnings provided on the 2007 W Series Workhorse chassis.

Be sure to fully understand all instructions and procedures before beginning to service components.

Observe all Caution and Warning safety alerts that precede instructions or procedures. These alerts help to avoid damage to components, serious personal injury, or both.

Follow all established maintenance and service, installation, and diagnostics guidelines.

Use special tools when required to help avoid serious personal injury and damage to components.

SAFETY ALERTS AND SUPPLEMENTAL INFORMATION



WARNING!

Warnings give an alert to an instruction or procedure that must be followed exactly to avoid death, serious injury or severe damage to major components. They will appear ahead of the action to which they apply.

READ AND OBSERVE ALL WARNINGS!



CAUTION

Cautions give an alert to an instruction or procedure that should be followed exactly to avoid injury or damage to components. They will appear ahead of the action to which they apply.

READ AND OBSERVE ALL WARNINGS!

NOTICE:

Notes provide information or suggestions that help to correctly service a component. They may or may not be read depending upon the circumstances. They will appear after the action to which they apply.

Comment, Clarification, Definition, Example, Explanation

... are useful explanations which may be read to increase understanding of procedures, functions or conditions. They may or may not be read depending upon the circumstances. They will appear after the action to which they apply.

Tip

Tips are intended to offer helpful ideas which may simplify the performance of the service or maintenance procedure. They may or may not be read depending upon the circumstances. They will appear after the action to which they apply.

WCC PRODUCT AND SERVICE INFORMATION ACCESS

Visit the Workhorse website at www.workhorse.com to access and order product and service information.

SPECIAL TOOL/EQUIPMENT REFERENCE INFORMATION

Allison: Order service literature from SGI Inc., Attn: Allison Literature Fulfillment Desk, 8350 Allison Avenue, Indianapolis, Indiana 46268, or call (888) 666-5799. Visit their website at: www.allisontransmission.com.

ArvinMeritor: Call (888) 725-9355 or visit their website at: www.arvinmeritor.com.

Bendix: Visit their website at: www.bendix.com.

Dana: Call (269) 567-1000, or visit their website at: www.dana.com.

Eaton Truck Components: Visit their website at: truck.eaton.com

ZF Steering Components: Visit their website at: www.zf.com/na/.

SPX Kent-Moore: 28635 Mound Road, Warren, Michigan 48092. Call (800) 345-2233, or visit their website at: www.spxkentmoore.com.

Tiger Tools: Call (800) 661-4661, or visit website at: www.tigertool.com.

Owatonna Tools: Contact OTC Tool and Equipment Division, 655 Eisenhower Drive, Owatonna, Minnesota 55060.

Great Lakes Tool Specialties: 8530 M-89, Richland, Michigan 49083. Call (800) 877-9618 or (616) 629-9628.

Snap-On Tools: Contact the local Snap-On dealer or visit their website at: www.snapon.com

SAFETY PRECAUTIONS

GENERAL PRECAUTIONS

Read and understand all of the safety precautions and warnings before performing any repair. This list contains the general safety precautions that must be followed to provide personal safety. Special safety precautions are included in the procedures when they apply.

Keep children away from the service area.

Wear safety glasses while working on vehicles or components.

Do not smoke.

Make sure the work area around the vehicle or component being serviced is dry, well lit, well ventilated, free from clutter, loose tools, parts, ignition sources and hazardous substances. Be aware of hazardous conditions that may exist.

Keep multi-class ABC fire extinguishers handy. Class A fires involve ordinary combustible materials such as wood and cloth; Class B fires, combustible and flammable liquid fuels and gaseous fuels; Class C fires, live electrical equipment. (Ref. NFPA No. 10).

Keep the engine and its compartment clean. Excess oil and oily rags can catch fire. Dirt and gear stowed in the compartment can restrict cooling air.

Make sure all fasteners are secure and torqued properly.

Do not work on the vehicle or any of its components or systems when mentally or physically fatigued or after consuming alcohol or drugs.

Dress appropriately. Do not wear loose-fitting or torn clothing. Remove all jewelry when working.

Always wear protective glasses and shoes when working.

Do not perform any repair when fatigued or after consuming alcohol or drugs that may impair performance.

Always use tools that are in good condition. Make sure that their use is fully understood before making use of them.

Always use the same fastener part number (or equivalent) when replacing fasteners. Never use a fastener of inferior quality if replacement is necessary.

PERSONAL INJURY PRECAUTIONS

The following are specific to the health and safety.

Motor vehicle repair or maintenance may be dangerous. Improper or careless practices can cause burns, cuts, mutilation, asphyxiation or other bodily injury or death.

All engine exhaust contains carbon monoxide, an odorless, colorless, poisonous gas that can cause unconsciousness and death. Symptoms of carbon monoxide poisoning include:

- ***Dizziness***
 - ***Headache***
 - ***Nausea***
 - ***Weakness and sleepiness***
 - ***Vomiting***
 - ***Inability to think clearly***
-

IF ANY OF THESE SYMPTOMS ARE EVIDENT, GET INTO FRESH AIR IMMEDIATELY. If symptoms persist, seek medical attention immediately.

Never sleep in the vehicle unless the vehicle is equipped with a working carbon monoxide detector.

Make sure there is ample fresh air when operating the engine in a confined area.

Diesel fuel is combustible. Do not smoke or turn electrical switches ON or OFF where fuel fumes are present or in areas sharing ventilation with fuel tanks or equipment. Keep flames, sparks, pilot lights, arc-producing equipment and all other sources of ignition well away.

Flammable vapor can cause a diesel engine to overspeed and become difficult to stop, resulting in possible fire, explosion, severe personal injury and death. Do not operate a diesel-powered engine where a flammable vapor environment can be created by fuel spill, leak, etc.

Sealing compounds burn easily and can produce dangerous vapors. To avoid injury, use in a well-ventilated area and keep away from open flame.

Adhesives burn easily and can produce dangerous vapors. To avoid injury, use in a well-ventilated area and keep away from open flame.

Used engine oil may be carcinogenic and can cause reproductive toxicity. Avoid inhalation of vapors, ingestion and prolonged skin contact with use engine oil.

Electricity, fuel, exhaust, moving parts and batteries present hazards which can result in severe personal injury or death.

Disconnect the battery (negative [-] cable first) and discharge any capacitors before beginning any repair work to prevent dangerous electric shock. Mount a "Do Not Operate" tag in the operator's position or on the controls.

Reconnect the negative (-) battery cable last after repairs or service are completed.

Tools used around electrical components or systems may cause short circuits, which can result in burns or electrical shock. To avoid injury, take care that tools do not create short circuits.

Use caution when working on live electrical equipment. Remove jewelry, make sure clothing and shoes are dry, stand on a dry wooden platform or rubber insulating mat and use tools with insulated handles.

Corrosion inhibitor, a component of CSA and lubricating oil, contains alkali. Take special precautions to keep it from the eyes. Avoid prolonged or repeated contact with skin. Do not take internally. In case of contact, immediately wash skin with soap and water. In case of contact, immediately flood eyes with large amounts of water for a minimum of 15 minutes. IMMEDIATELY CALL A PHYSICIAN. KEEP OUT OF THE REACH OF CHILDREN.

Naphtha and Methyl Ethyl Ketone (MEK) are flammable materials and must be used with caution. Follow the manufacturer's instructions to provide complete safety when using these materials. KEEP OUT OF THE REACH OF CHILDREN.

Compressed air used for cleaning purposes must be used with care to prevent personal injury. Use goggles/face shields and gloves as appropriate, and take precautions that the air pressure does not exceed 30 psi.

Wire, hoses or braided cables may have sharp projections which can cut. Wear protective gloves when inspecting.

Rotating or moving parts can cause cuts, mutilation or strangulation. Do not wear loose clothing or jewelry near moving parts such as PTO shafts, fans, belts and pulleys. Keep hands away from moving parts. Keep guards in place over fans, belts, pulleys, and other moving parts.

Do not use evaporative starting fluids. They are highly explosive.

Battery gas is explosive. Fuel lines must be secured, free of leaks and separated or shielded from electrical wiring.

To avoid burns, be alert for hot parts on components that have just been turned off, and hot fluids in lines and tubes.

Use only the proper engine barring techniques for manually rotating the engine.

Do not attempt to rotate the crankshaft by pulling or prying on the fan, which can cause serious personal injury, property damage or damage to the fan blade(s), which can lead to premature fan failure.

If an engine has been operating and the coolant is hot, allow the engine to cool before slowly loosening the coolant filler cap to relieve pressure from the cooling system, and before opening the coolant drain tap. Hot coolant under pressure can spray out and cause severe burns.

Do not work on any vehicle or components supported only by lifting jacks or a hoist. Always use blocks or proper stands to support the vehicle or component before performing any service work.

Relieve all pressure in the oil, fuel and the cooling systems before any lines, fittings or related items are removed or disconnected. Be alert for possible pressure when disconnecting any device from a system that utilizes pressure. Do not check for pressure leaks by hand, as high pressure fuel, oil or coolant can cause personal injury.

To prevent suffocation and frostbite, wear protective clothing and only disconnect fuel and liquid refrigerant (freon) lines in a well ventilated area.

Heavy parts can cause crush injuries. Treat heavy parts with care, and ensure that they cannot fall and cause injury.

To avoid personal injury, use a hoist or get assistance when lifting components that weigh 50 pounds or more. Make sure all lifting devices such as chains, hooks or slings are in good condition and are of the correct capacity. Make sure hooks are positioned correctly. Always use a spreader bar when necessary. The lifting hooks must not be side-loaded.

ENVIRONMENTAL PRECAUTIONS

The following are specific to environmental concerns.

Coolant is toxic. If not being reused, dispose of in accordance with local environmental regulations.

Ethylene glycol, used as engine antifreeze, is toxic to humans and animals. Clean up spills and dispose of used engine coolant in accordance with local environmental regulations

*To protect the environment, liquid refrigerant systems **MUST** be properly emptied and filled using equipment that prevents the release of refrigerant gas (fluorocarbons) into the atmosphere. Federal law requires capturing and recycling refrigerant.*

TORQUE SPECIFICATIONS

The following are general torque values for components. A similar display will appear at the end of each section.

Table 1 Torque conversions

lb-ft (English)	1.36	Nm (Metric)
Nm (metric)	.74	lb-ft (English)
lb-ft (English)	12	lb-in (English)
lb-in (English)	÷ 12	lb-ft (English)

Table 2 General torque specifications - English*

Ø	Pitch	Grade		
		2	5	3
1/4	20	5 lb-ft	7 lb-ft	11 lb-ft
1/4	28	6 lb-ft	9 lb-ft	13 lb-ft
5/16	18	10 lb-ft	15 lb-ft	22 lb-ft
5/16	24	11 lb-ft	17 lb-ft	24 lb-ft
3/8	16	18 lb-ft	28 lb-ft	40 lb-ft
3/8	24	21 lb-ft	30 lb-ft	45 lb-ft
7/16	14	29 lb-ft	45 lb-ft	65 lb-ft
7/16	20	31 lb-ft	50 lb-ft	70 lb-ft
1/2	13	45 lb-ft	70 lb-ft	95 lb-ft
1/2	20	50 lb-ft	75 lb-ft	110
9/16	12	65 lb-ft	100	140
9/16	18	70 lb-ft	110	155
5/8	11	90 lb-ft	135	190
5/8	18	100	155	215
3/4	10	150	240	340
3/4	16	180	270	380
7/8	9	255	360	550

*Lubricated, into cast iron.

Table 3 General torque specifications - Metric*

Ø	Pitch	Grade		
		5.6	8.8	10.9
mm	mm/Thread			
M6	1.00	3.6	7.9	11 lb-ft
M8	1.00	9.6	19 lb-ft	28 lb-ft
M8	1.25	8.7	16 lb-ft	26 lb-ft
M10	1.25	19 lb-ft	40 lb-ft	55 lb-ft
M10	1.50	17 lb-ft	37 lb-ft	53 lb-ft
M12	1.25	33 lb-ft	72 lb-ft	101
M12	1.75	30 lb-ft	66 lb-ft	92 lb-ft
M14	1.50	53 lb-ft	114	160
M14	2.00	50 lb-ft	105	147
M16	1.50	82 lb-ft	174	245
M16	2.00	77 lb-ft	163	230
M18	1.50	123	254	356
M18	2.50	106	225	317
M20	1.50	166	355	500
M20	2.50	150	320	450
M22	1.50	224	475	670
M22	2.50	204	435	610

*Lubricated, into cast iron.