Section 6
Frame Components

GENERAL DESCRIPTION

The machine's frame consists of a front and rear section coupled via an articulation joint. The articulation joint gives the machine the ability to steer left and right via a hydraulic steering cylinder. An operator's compartment is situated on the left side of the rear frame with the transmission located in the centre. The engine and main hydraulic and pneumatic components are also located in the rear frame, towards the rear of the machine.

The front frame houses the lift arm assembly, located in the centre of the front frame chassis. The front of the lift arm is attached to the fork tine backing plate (cradle) via pinned bottom joints and fixed to the tilt cylinders via pins on the top of the backing plate.

SAFETY PRECAUTIONS

The following safety precautions are not intended to be exhaustive. Safe work practices should be used when servicing or operating heavy machinery.

ALWAYS give the engine an opportunity to cool down before performing servicing around the rear frame as engine components around this location are hot and could cause burns or scalding.

ALWAYS be aware of, and isolate, other forms of energy and pinch points (fan, belts, pulleys and drive lines) when accessing the engine compartment including pneumatic stored pressure, engine coolant pressure and other heat sources such as engine block and exhaust system components.

ALWAYS tag out a machine before working on any part.

ALWAYS install the articulation lock when accessing the machine articulation area as machine articulation will result in crush injuries (see Section 1).

ALWAYS install the lift arm stands when access underneath the lift arm assembly is required. Remove any load before raising the lift arm assembly (see Section 1).

NEVER assume that all forms of energy have been isolated unless you have confirmed for yourself.

FRONT FRAME

CHASSIS

The front frame is a welded chassis which facilitates fitment to the rear frame via the articulation joint and houses the lift arm, lift cylinder and tilt cylinder assemblies. The front frame also houses the forward facing headlights, the machine fire extinguisher (driver's side) articulation lock (driver's side). Grease manifolds are located each side of the front frame for lubrication of the frame components.

Care and Maintenance

Daily:

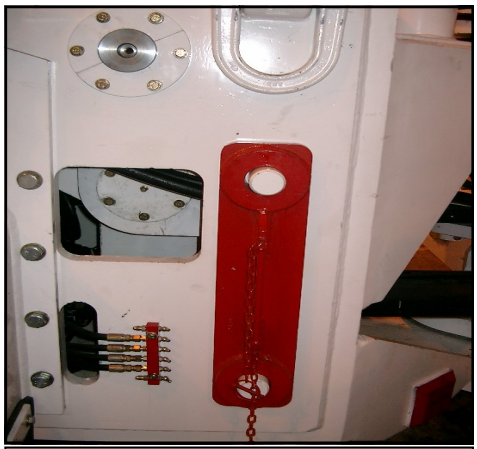
1. Visually inspect the front frame and associated components for damage.
2. Check the security of the fire extinguisher, fire suppression bottles and articulation lock mountings.
3. Verify that the fire extinguisher is functional.

Servicing

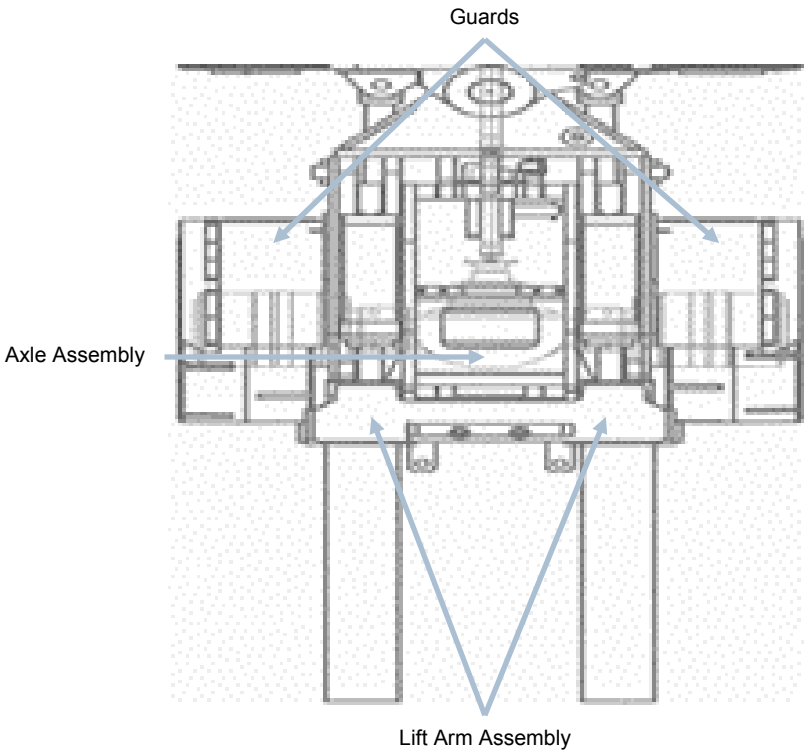
Weekly:

1. Grease the pin joints via the remote grease manifolds positioned both sides of the front frame in the articulation joint. These manifolds allow individual greasing to the top and bottom lift cylinder pins, inside and outside lift arm pins. Raise and support the lift arm to observe purging of grease at the relevant pins to ensure adequate lubrication.
2. Grease the tilt cylinder pins and lift cylinder pins on the driver's and off driver's side. Grease nipples are located on the cover plates on the inside and outside of each pin. Observe purging of grease at the pins to ensure adequate lubrication.

Articulation Lock in Locked Position



Articulation Lock in Stored Position



Front Frame Assembly

Fire Suppression System

LIFT ARM

GENERAL

The lift arm is a welded member pinned the front frame and lift cylinder top pins. The lift arm facilitates raising and lowering of the carried load. The back plate for the fork tines is pinned to the front of the lift arm and to the tilt cylinder clevises to enable load tilt.

Care and Maintenance

Daily:

Visually inspect the lift arm for structural damage.

Servicing

Weekly:

1. Grease the lift arm to back plate cradle pivot pins. Tilt the back plate forward to gain access to both sides of the driver's and off driver's side pins. Observe purging of grease at the pins to ensure adequate lubrication.
2. Grease the rear top lift cylinder pins on the driver's and off driver's side. Grease nipples are located on the top pin on the cylinder clevis on each tilt cylinder. Observe purging of grease at the pins to ensure adequate lubrication.

Lift Arm in Raised Position

NEVER work or stand underneath lift arm unless the lift arm locks are installed. See (Section 1) Isolation.

FITTING AND REMOVAL OF LIFT ARM LOCK

To fit the lift arm lock:

1. Remove any load from the forks.
2. Chock the wheels.
3. Fit the articulation lock.
4. Raise the lift arm until the locking pin holes are clear and the pin can be placed in the location points.
5. Remove the lock pins from storage locations and install in the aligned holes on the lift arm
6. Note that the pin is to be fully inserted into the holes.
7. Lower the boom slightly to take the weight on the lock pin.
8. It is now safe to work under the lift arm.

To remove the lift arm lock**:**

1. Remove the lock pin from the locating holes and secure in their respective storage locations.
2. Lower the lift arm to the ground.

The lift arm on this machine can cause fatal crush injuries if extreme caution is not observed. NEVER access or perform work under the lift arm unless the engine has been shutdown, the articulation lock fitted, the park brake applied, the load has been removed and the lift arm has been supported in the raised position.

Lift Arm Lock Pin Installed

Storage Position on Front Frame

FORK CRADLE ASSEMBLY

The fork cradle facilitates attachment of the load carrying forks on the front of the machine, to help facilitate the carrying and the securing of the loads a cookie plate can be fitted to the fork cradle and pinned,

Mounted at the back to the cradle is a hydraulically driven winch that ca assist in he loading of loads and equipment.

Care and Maintenance

Daily:

1. Visually inspect fork cradle for any structural damage.
2. Check the tine for any sign of cracking.
3. Ensure the winch rope guide rollers are free to turn.

Servicing

No routine servicing is required on the fork cradle other than visual inspection for structural integrity, hydraulic operation and greasing outlined in this Section.

Fork Cradle and Cookie Plate

WINCH ASSEMBLY

The winch assembly is mounted at the back of the lift arm, it consists of a hydraulically driven motor, planetary box, gearbox, rope drum and winch rope. The planetary and gearbox assemblies are separate units with there own oil capacities (Refer to the Preventative Maintenance Schedules).

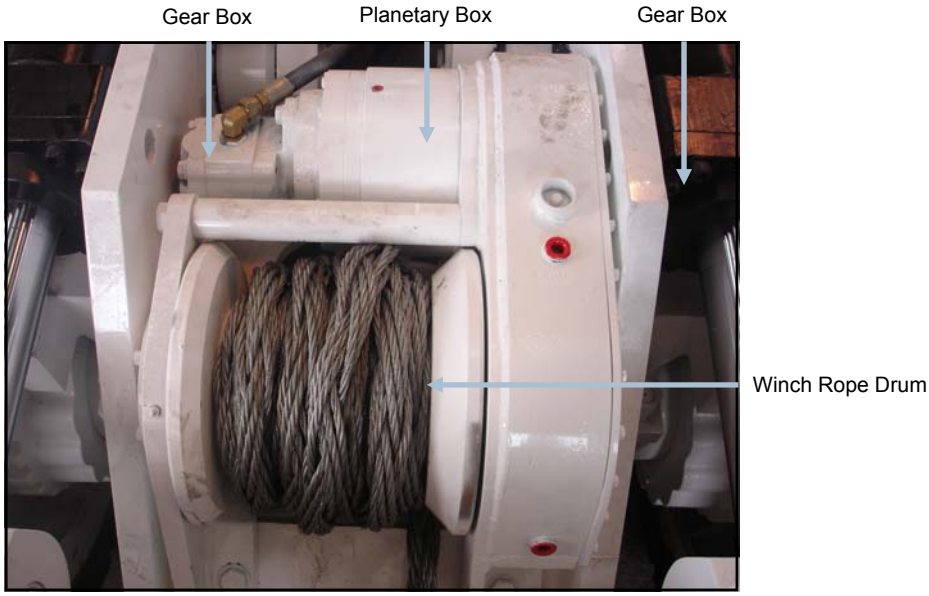
Care and Maintenance

Daily:

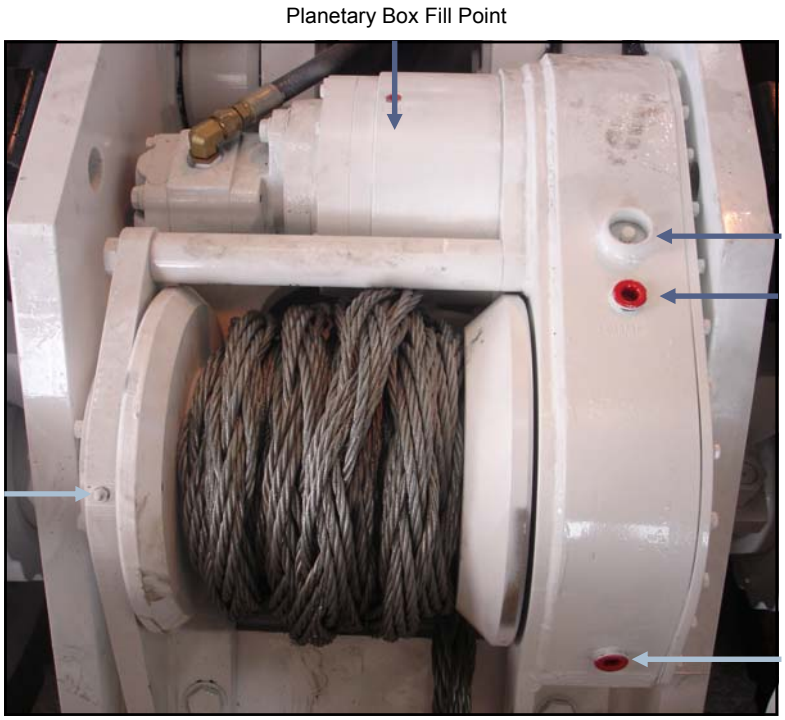
1. Visually inspect the mounting bolts.
2. Inspect for oil leaks from seals, gaskets and hosing.
3. Visually inspect rope anchorage for security and damage.
4. Check the rope and eye for any sign of damage.
5. Ensure the winch rope guide rollers are free to turn.

Servicing

Refer to the Preventative Maintenance Schedule.



Winch Assembly



Winch Assembly Lube Points

NOTICE

The planetary box level and drain plugs are not visible in this picture, they are at 90 degrees and 180 degrees from the fill point.

There are two winch top options, a wire rope and a synthetic rope.

Wire Rope Mounting:

The winch rope is mounted to the winch rope drum via a U-bolt that goes through the drum and is tightened, this clamps the swaged end of the rope into the recess of the drum (shown in *green*). The U-bolt should be positioned approximately in the middle of the swaged section of the rope (shown in *blue*) and tightened as recommended in Section 1 of this manual.

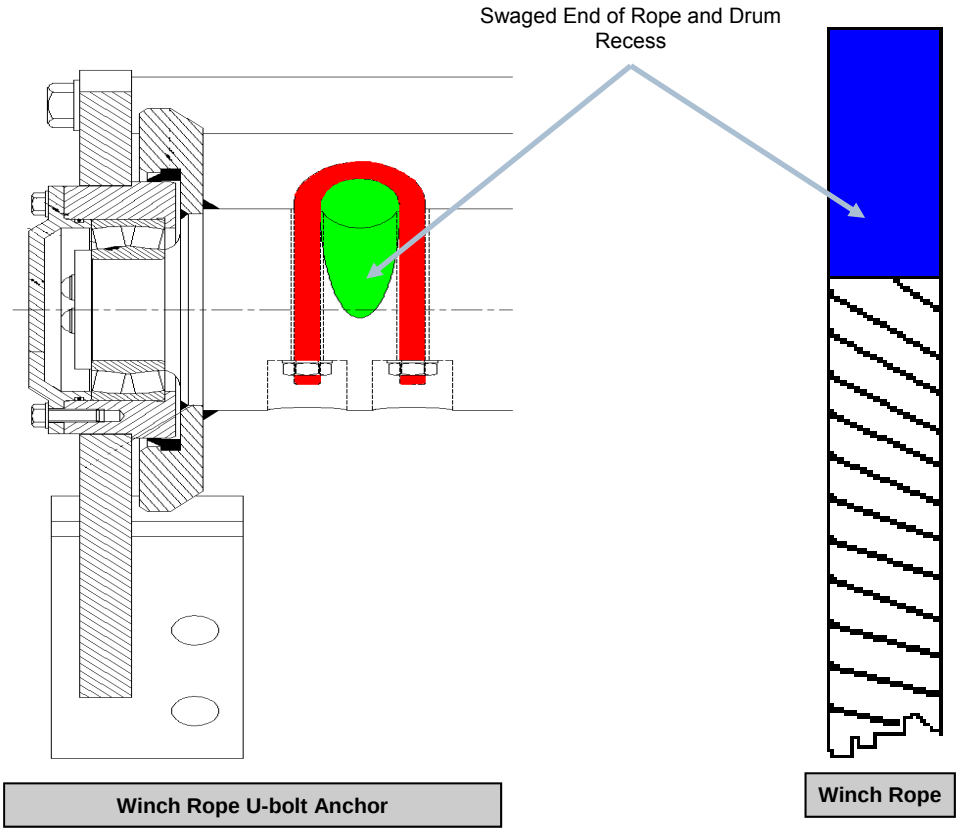
Care and Maintenance

Daily:

1. Visually inspect rope anchorage for security and damage.
2. Check the rope for any sign of damage.
3. Ensure the winch rope guide rollers are free to turn.

Servicing

Refer to the Preventative Maintenance Schedule.



Synthetic Rope Mounting:

The winch rope is mounted to the winch rope drum via a U-bolt that goes through the drum and is tightened, this clamps the end of the rope and one full wrap of the rope around the drum into the recess of the drum (shown in photo). The U-bolt should be tightened as recommended in Section 2.4 of this manual.

Care and Maintenance

Daily:

1. Visually inspect rope anchorage for security and damage.
2. Check the rope for any sign of damage.
3. Ensure the winch rope guide rollers are free to turn.

Servicing

Refer to the Preventative Maintenance Schedule.

Synthetic Winch Rope clamped by U-bolt

REAR FRAME

CHASSIS

The rear frame is a welded chassis coupled to the front frame via the articulation joint. The rear frame houses the engine system, transmission, hydraulic pumps, filters, fluid tanks and operator's compartment.

The rear frame also houses the cooling system radiator, rear axle, tow hitch and rearward facing headlights. There are several different covers which are mounted and hinged of the rear frame.

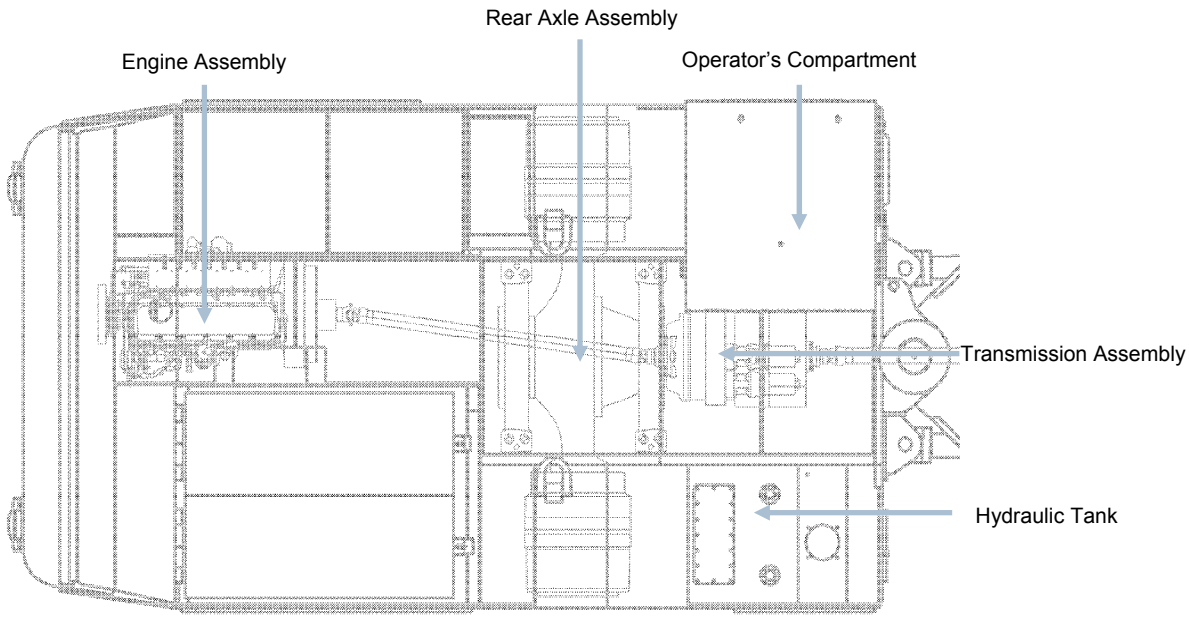
Care and Maintenance

Daily:

1. Visually inspect the rear frame and associated components including access covers for damage.
2. Visually inspect the tow clevis, coupling pin and retaining device for signs of structural damage.

Servicing

Refer to the Preventative Maintenance Schedule.



Rear Frame Assembly

OPERATOR'S COMPARTMENT

The operator's compartment consists of the door assembly and canopy assembly. Other assemblies that are mounted to or from the operator's compartment are the dash, the pedal and the seat.

COMPARTMENT DOOR ASSEMBLY

The compartment door assembly is designed to safely contain the operator inside the compartment. The door assembly locks in the closed position and releases a pneumatic interlock which applies the brakes when opened.

Care and Maintenance

Daily:

1. Visually inspect the door assembly for structural damage, including the deflector bar located on the outside of the door plate.
2. Check the door hinge for free operation.
3. Check the locking latching mechanism for free operation.

Servicing

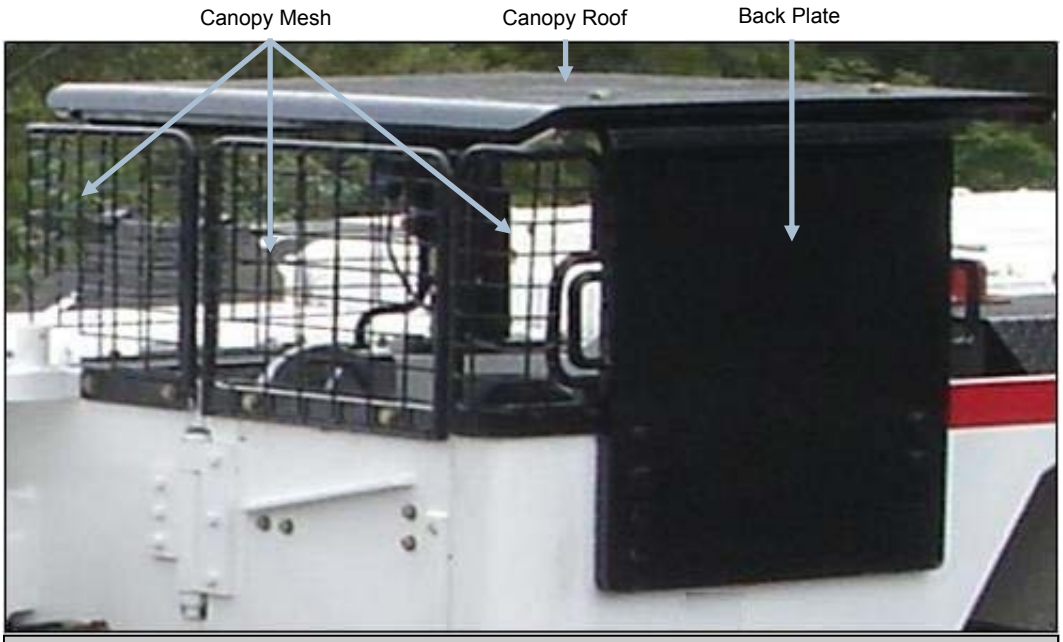
No routine servicing is required on the compartment door assembly other than visual inspection for structural integrity and free operation. Occasional lubrication of the door hinges and the door latch mechanism may be required if the operation appears difficult. Use multi-purpose EP grease to lubricate the hinge pins and door latch bolts as required.

Operator's Compartment

Door Interlock Valve

CANOPY ASSEMBLY

The operator canopy assembly is designed to provide safe overhead protection for the operator. The canopy assembly is of welded construction and is bolted to the operator's compartment. The canopy assembly may be raised or lowered to suit varying operating conditions. The canopy is fitted with mesh on the front and inside of the assembly to protect the operator in case the winch rope breaks.



Operator's Canopy

Maintain a minimum clearance of 1000 mm from the seat horizontal to the underside of the canopy assembly to ensure adequate operator head room clearance. Low operating clearances that require minimum head room below 1000 mm should be reviewed via risk assessment to address hazards identified by low head room clearance.

To adjust the canopy height:

1. Place an M16 or ⅝" collared eye bolt through the 20 mm hole in the canopy top plate and support the canopy with a suitable lifting device. The lifting device must be rated to support a canopy mass of 300 kg.
2. Remove the two 1" bolts and nylock nuts from the front supports and discard the nuts.
3. Remove the six ¾" bolts, nylock nuts and defector plate from the rear supports and discard the nuts.
4. Raise or lower the canopy assembly with the lifting device. *NOTE*: That the canopy assembly can be raised or lowered in increments of 63 mm (2½").
5. Fasten the canopy to the supports with existing ¾" and 1" bolts and new nylock nuts.
6. Torque fasteners as per Bolt Torque Specification Table.

Care and Maintenance

Daily:

Visually inspect the canopy assemblies and supports for structural damage.

Servicing

Every 250 service hours:

Torque the canopy assembly mounting fasteners as per Bolt Torque Specification Table.

OPERATOR'S SEATING

Seating is provided for the operator. The operator's seat is an in board facing adjustable position seat with suspension fitted. The suspension system consists of mechanical suspension with hydraulic shock dampening. An optional swivel seat base is available. A lap sash seat belt is fitted to the seat assembly for operator security.

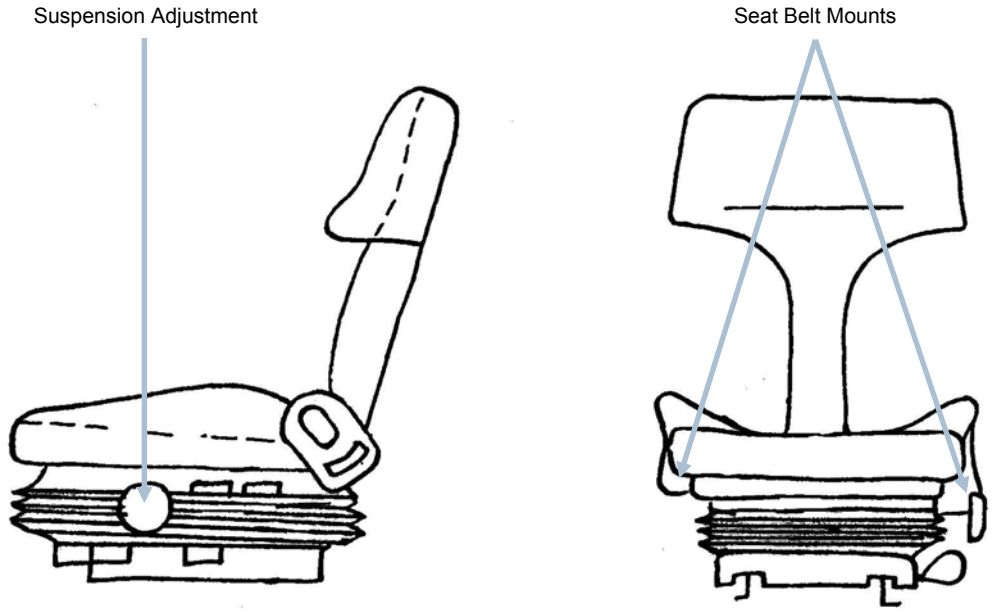
Care and Maintenance

Daily:

Visually inspect seating and seat belts for damage.

Servicing

No routine servicing is required on the seating other than visual inspection for functionality.



Operator's Seating

ARTICULATION JOINT

The articulation joint couples the front frame to the rear frame and provides the pivot point for machine steering. The joint consists of a fixed pin and spherical bearing on the top clevis with a floating pin joint on the bottom clevis.

Care and Maintenance

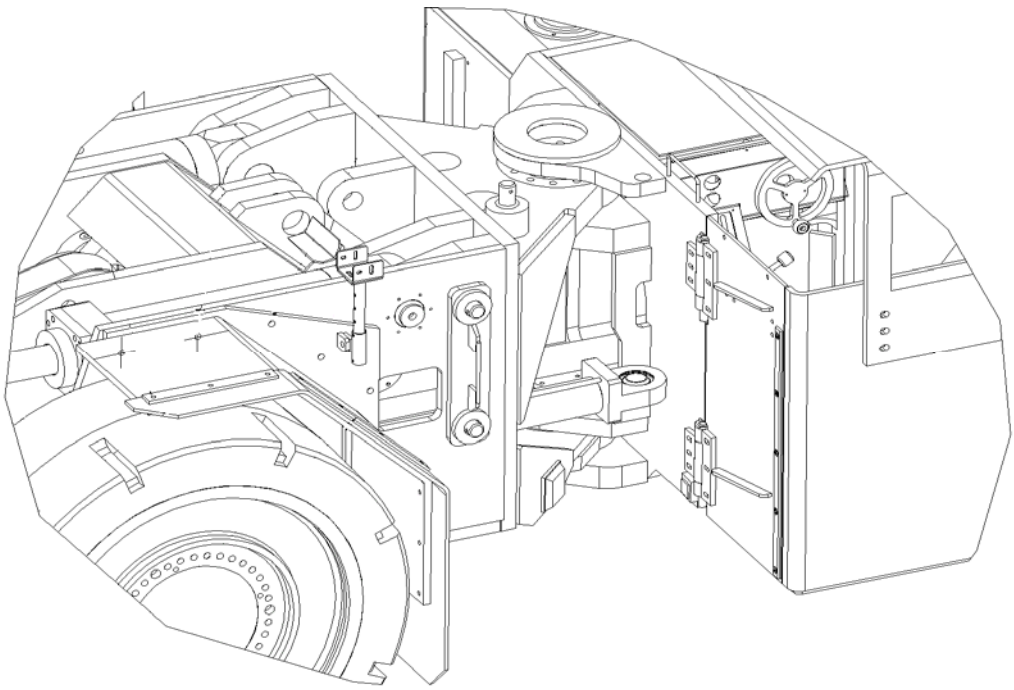
Daily:

Visually inspect articulation joint for any structural damage.

Servicing

Every 250 service hours:

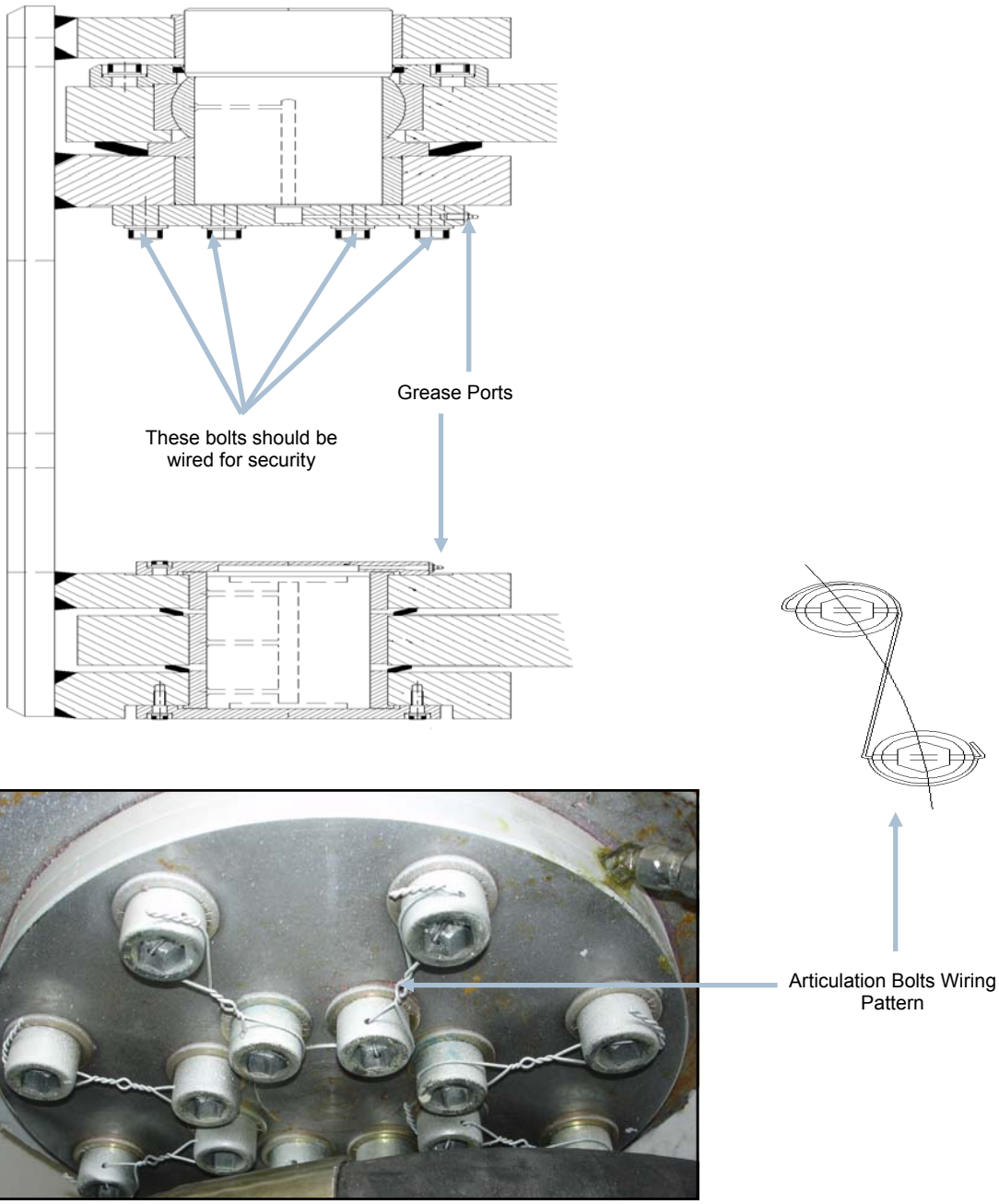
1. Check the bolt torque on the articulation joint retaining plate fasteners as per Bolt Torque Specification Table
2. Grease the top and bottom articulation pin joints. Grease nipples are located on the articulation pins at the top and bottom joints. Observe purging of grease at the pins to ensure adequate lubrication.



Articulation Joint

The articulation joint comprises of bushes, pins and a bearing which should be greased at weekly intervals. The fasteners that are used should be inspected on a weekly service basis, if they are found to be loose, damaged or missing they should be replaced and secured as shown below.

The recommended Bolt Torque Table in Section 1 should be used.



Wiring Pattern

COVERS

The rear frame is fitted with various sized covers, doors and grills all of these are an integral part of the machine and should be kept in good working order. This will help protect personnel from accidental injury, also the machine components from damage.

Each cover on the top of the machine is fitted with one or more gas struts and are pinned.

Care and Maintenance

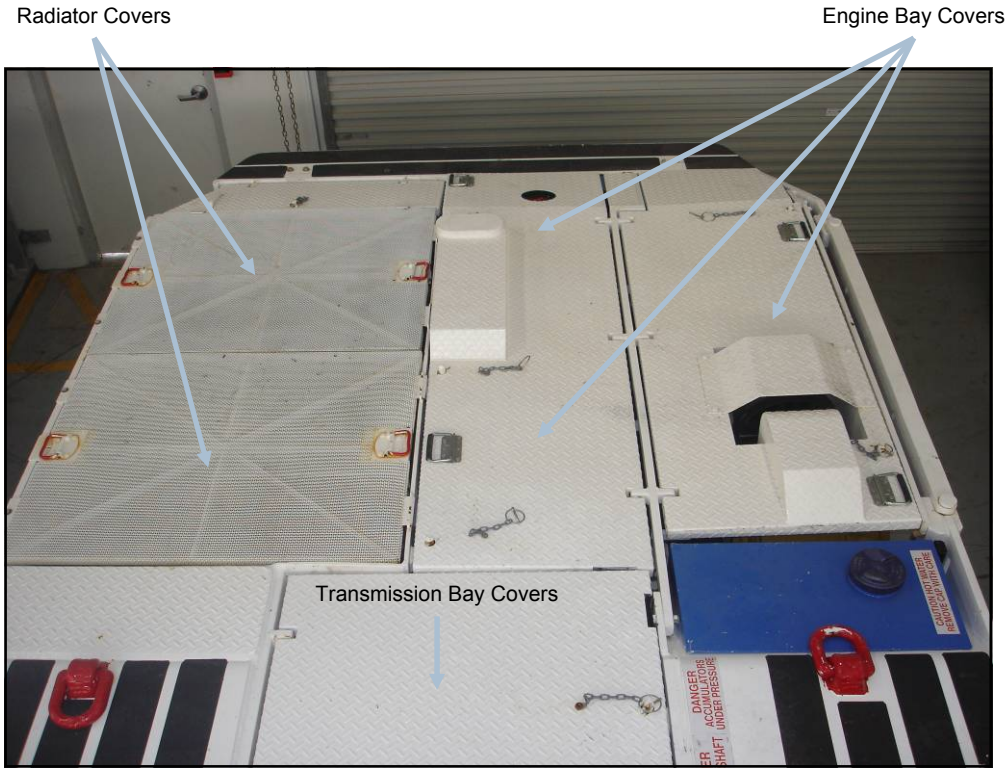
Daily:

Visually inspect covers, doors and grills for any structural damage.

Servicing

Weekly:

1. Check the bolts and pins for security.
2. Check gas strut for security and leaks.



Covers

Gas Struts Fitted to Covers

Engine Cover

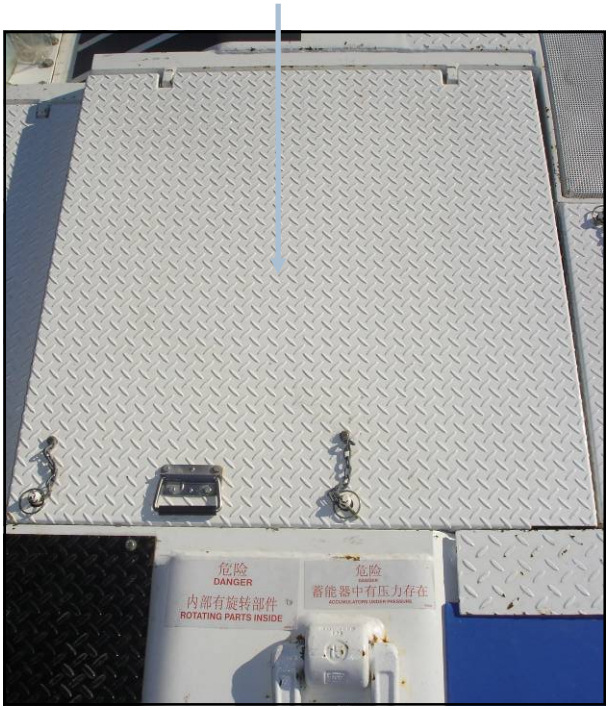
Cooling Fan and Alternator Grills

Grill Covers

WARNING

Under some of the covers on this machine there are rotating parts which may cause serious injury. The machine must be isolated before any maintenance procedure is under taken, for the isolation procedure see Section 1 of the this manual.

Rotating Parts - Driveshaft



Rotating Parts - Belt Pulleys

Covers