

**Drott
40 Cruz-Air
Series "B"**

Service manual

S-406179M1

CASE

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Look for this symbol which points out important safety precautions. It means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



WARNING: Always use a non-flammable solvent for cleaning component parts. Do NOT use gasoline or other flammable substances.



CAUTION: When servicing the machine, tag mark the ignition switch to alert other operators and prevent accidental start-ups.



WARNING: Storage batteries give off highly explosive hydrogen gas when being charged. Keep sparks or open flames away from batteries.



WARNING: If battery electrolyte contacts skin or clothing, flush immediately and thoroughly with water.



CAUTION: DO NOT service the machine with engine running. If necessary to make checks with engine running, have one man stay at the controls while the other makes the check.



CAUTION: Keep hands, feet and loose clothing away from fan belts, fans, and pulleys whenever machine is operating.



CAUTION: When working on the hydraulic system or air system, be sure to relieve all pressure in the lines by working the controls back and forth several times before removing component.



CAUTION: Always deflate tires before removing them from the machine for servicing. Tires can come apart with an explosive force if not handled properly.



CAUTION: When servicing the cooling system, be sure to relieve pressure in the system by carefully turning the radiator cap to its first position before removing it completely.



CAUTION: Wipe oil spills immediately to prevent accidents. Keep work area as clean as possible. A cluttered work area invites accidents.



CAUTION: Disconnect the positive lead from the Batteries when working on the engine or Electrical System.



WARNING: Never smoke while refueling, servicing the fuel system or working with batteries.



CAUTION: When removing major components such as the boom or turntable, ensure that they are properly slung and adequately secured.



WARNING: To prevent eye injuries, wear safety glasses when servicing this machine.

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Want to get more information,
Please click here, Then get the complete
manual**

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NOMENCLATURE

DROTT[®] CRUZ-AIR

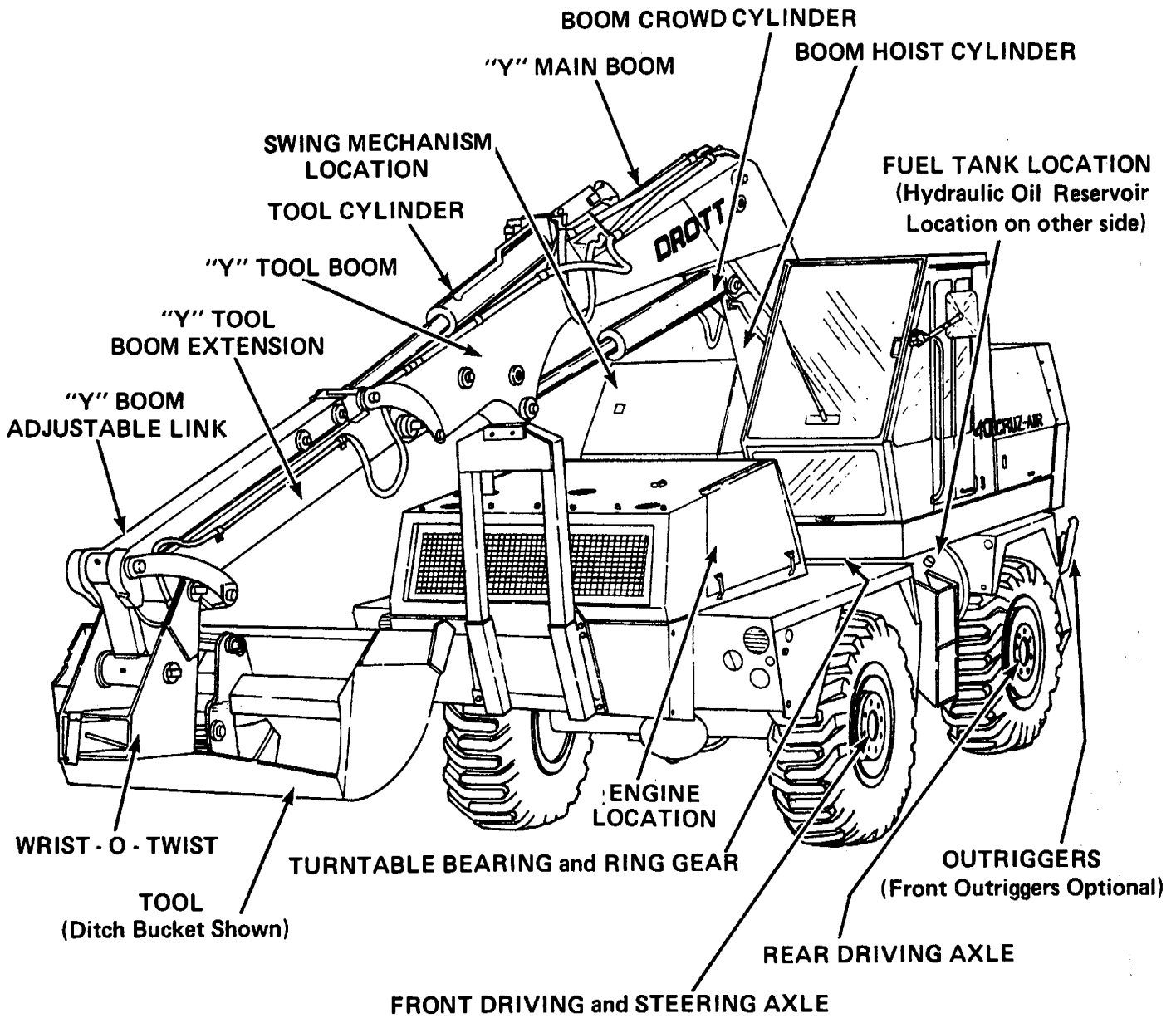


Figure 1. Nomenclature

INTRODUCTION

This manual is designed to serve as a guide in maintaining and servicing the DROTT 40B CRUZ-AIR. All components, circuits, and functions are included, except the engine. In this case, the reader is referred back to the Engine Manufacturer's Manual included with each machine.

For easier troubleshooting, the machine is divided into four general systems - Mechanical, Air, Electrical and Hydraulic. Each system and each component is explained to provide the understanding necessary for good troubleshooting. Troubleshooting Charts are used extensively to provide the serviceman with a quick and easy reference.

Disassembly and Repair procedures for individual system components are found near the end of each section. Written instructions are supplemented with exploded view drawings, and photographs and artwork wherever it is deemed essential in explaining critical steps.

Torque Charts and schematic drawings of the Air, Electrical and Hydraulic systems are located in the back of this manual for convenience while troubleshooting and servicing the unit.

DIRECTIONAL REFERENCE

Since the turntable on the CRUZ-AIR will rotate through a complete 360 degrees, the chassis and turntable must be considered separately in regard to the terms, RIGHT, LEFT, FRONT and REAR. Chassis directions are given as viewed from the rear of the machine, facing forward; turntable directions are

given as viewed from the Operator's seated position. Directional references for both the turntable and chassis are the same when the machine is in the normal DRIVING position (boom over front - engine end).

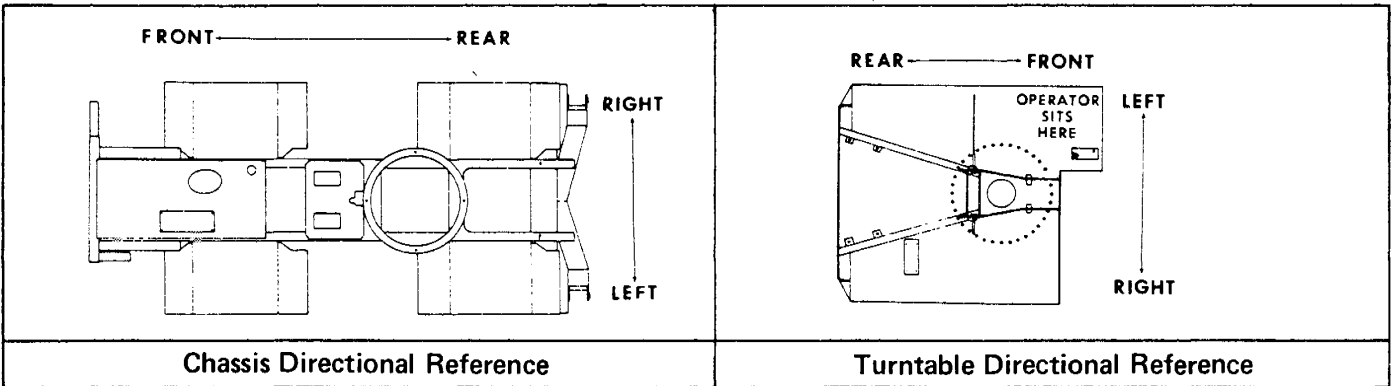


Figure 2. Directional Reference

PARTS AND SERVICE

When writing or calling the distributor or manufacturer about your DROTT machine, always refer to the Model and Serial Number, as well as the part name and location. These numbers are found on the Identification Plate located on the lower right side of the Operator's Cab (see figure 3).

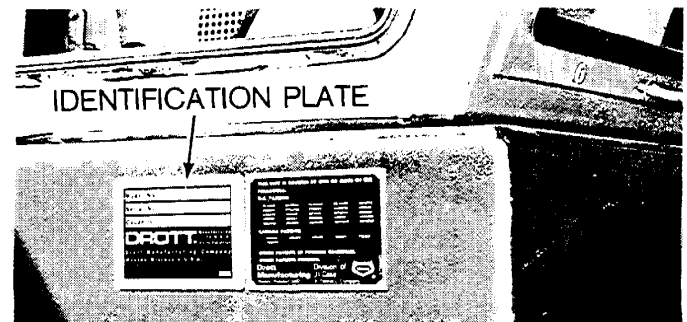


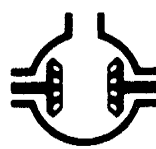

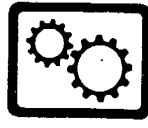







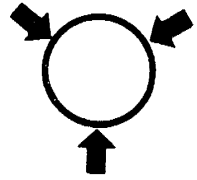


Figure 3. Identification Plate

INTERNATIONAL SYMBOLS

 ENGINE	 TRANSMISSION	 DIFFERENTIAL	 TORQUE CONVERTER	 GEAR BOX	 HYDRAULIC RESERVOIR	
 COOLANT	 FILTER, AIR	 LUBRICATE with Multipurpose Grease	 HYDRAULIC OIL FILTER	 BRAKE OIL	 DIESEL FUEL	 AIR PRESSURE

SECTION 1

SCHEDULED PREVENTIVE MAINTENANCE

INTRODUCTION

Scheduled preventive maintenance is essential to keeping the machine in top operating condition. Decide from the start upon a maintenance schedule that will best suit your particular needs. The type of work being done, the size of loads, ground and weather conditions should all be taken into consideration when establishing a schedule.

Use the hourmeter, along with a calendar and checklist to ensure that all recommended maintenance is performed at prescribed intervals. Our recommendations are based upon average operating conditions, and should be considered as the MINIMUM requirements.

Depart from the recommended intervals only when conditions warrant shortening them, or when changes in ambient temperature require it. The recommended intervals should be shortened whenever the machine is operated under extreme conditions, such as on a dusty job site, in extreme heat or cold, under intermittent operation or extremely heavy loads.

LUBRICANTS

It is not the policy of DROTT Manufacturing to publish lists of approved lubricants or to guarantee lubricant performance. The responsibility for the quality of any lubricant rests solely with the Distributor or Manufacturer.

In various paragraphs of this manual, you will find the statement "Use (lubricant brand name) or functional equivalent". This statement does not constitute an unconditional guarantee of the performance of the brand of oil mentioned; it is intended only as a guide to the type of lubricant recommended for a given application.

SPARK ARRESTORS

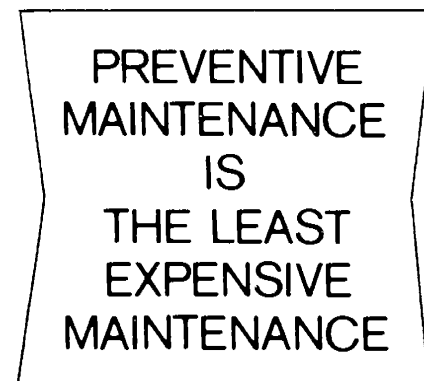
Laws of some states or provinces may require that this unit be equipped with a SPARK ARRESTOR or SPARK ARRESTING MUFFLERS. The State of California, as an example, is one state which has such regulations for agricultural and forestry applications, plus a regulation for construction applications in forest-covered, brush-covered or grass-covered lands.

Typically, such laws and regulations require spark arresting devices to be maintained in good working order and typically to be attached to the exhaust system on naturally aspirated engines (engines without a turbo-charger).

CLEANING SOUNDPROOFING INSULATION

Care must be taken when cleaning Cab interiors which have soundproofing insulation installed. To clean the insulating material, use only a vacuum cleaner, or damp cloth with plain water, or mild detergent solution.

DO NOT steam clean, wash, or rinse with a water hose, etc., since only a slight wetting of the insulation will substantially reduce its soundproofing ability.



HYDRAULIC OIL RECOMMENDATIONS

DROTT DHF Fluid is recommended for year-round use in the hydraulic system; or, as an alternate, use SAE 10W (system temperatures 0° to 180°F. [-18° to 82° C.]) SAE 20-20W (system temperatures 50° to 210° F. [10° to 90° C]), and SAE 5W or SAE 5W-20 (arctic conditions).

Viscosity: The viscosity of the oil at starting should not exceed 4000 SSU or drop below 60 SSU for sustained high temperature operation. The optimum operating conditions are between 80 SSU and 180

SSU. The viscosity index should not be less than 90 (for this service).

Arctic Conditions: The use of an auxiliary heater, a warm-up period avoiding high speed operation of hydraulic components until the system is warm, and the use of SAE 5W or SAE 5W-20 oils may be necessary, provided the viscosity requirements for sustained high temperature operation are not exceeded at maximum operation temperatures. See paragraph on Viscosity above.

COMPONENT CAPACITIES

Component	Lubricant/Fluid	Capacity
Engine Crankcase	See Engine Manufacturers Manual	12 qts. (11.4L) +2 w/filter
Engine Cooling System	1/2 ethylene glycol base anti-freeze, 1/2 water	7-1/4 gal. (27.4L)
Fuel Tank	See Engine Manufacturer's Manual	50 gal. (190L)
Drop Box Transmission	SAE 90 gearlube	4 qts. (3.8L)
Torque Converter and Forward/Reverse Unit	DROTT DHF Fluid or Type "A" Suffix "A" Transmission Fluid	11 qts. (10.4L)
Differentials (front & rear)	EP 80-90 gearlube	3 gal. (11.4L)ea.
Planetary Hubs	EP 80-90 gearlube	1 gal. (3.8L) ea.
Hydraulic Reservoir	DROTT DHF Fluid or as alternate SAE 10W (System temperatures 0° F [-18° C] to 180° F [82° C]) and SAE 20-20W (System temperatures 50° F [10° C] to 210° F [99° C]). Artic Conditions - 5W to 5W-20	18.7 gal. (70.8L)
Complete Hydraulic System		35 gal. (132L)
Swing Gearbox	EP 80-90 gearlube	5-1/2 qts. (5L)
Accelerator Master Cylinder	Brake Fluid - must meet or exceed SAE spec J-1703C	
Brake Master Cylinder		
Turntable Open Gear	Lubricate with spray-on open gear lubricant	

HYDRAULIC SYSTEM OPERATING PRESSURES

Valve/Circuit	Pressure Setting
Main Reliefs	2050 psi (14 100 kPa)
Steering System Relief	1600 psi (11 030 kPa)
Swing Port Reliefs	2500 psi (17 200 kPa)
Swing Crossover Relief	1350 psi (9300 kPa)

Valve/Circuit	Pressure Setting
Hoist Port Reliefs	3000 psi (20 700 kPa)
Crowd Port Reliefs	3000 psi (20 700 kPa)
Tool Port Reliefs	3000 psi (20 700 kPa)

PREVENTIVE MAINTENANCE SCHEDULE

DAILY OR EVERY 10 HOURS

Engine	Check oil and coolant
Engine Air Cleaner	Check restriction indicator
Fuel Tank	Fill at end of shift to prevent condensation
Air Reservoir	Drain moisture at end of each shift
Hydraulic Reservoir	Check fluid level and fill
Turntable Open Gear	Lubricate with open gear lubricant
Boom	Lubricate all grease fittings
Tires	Check for proper inflation
Operator's Cab	Clean thoroughly
Outrigger Arm Channel	Clean

WEEKLY OR EVERY 50 HOURS

Engine	Check V-belt deflection (See Engine Manual)
Drop Box Transmission	Check oil level and fill
Torque Converter and Forward/Reverse Unit	Check fluid level and fill
Differentials	Check oil level and fill
Planetary Hubs	Check oil level and fill
Swing Gearbox	Check oil level and fill
Accelerator Master Cylinder	Check fluid level and fill
Brake Master Cylinder	Check fluid level and fill
Batteries	Check Electrolyte level and fill
General Machine Lubrication	Grease (See Pictorial Listing)
Shifting Linkage Tubes	Lubricate with dry lubricant

EVERY 2 WEEKS OR 100 HOURS

Engine Air Cleaner	Clean or replace element
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MONTHLY OR EVERY 250 HOURS

Turntable Capscrews	Retorque
Service Brake Control Valve	Lubricate lever roller and roller pins with light engine oil

EVERY 2 MONTHS OR 500 HOURS

Air Compressor Strainer	Clean or replace
In-line Hydraulic Filters	Clean 100 mesh screen, replace paper filter
Torque Converter and Forward/Reverse Unit	Drain and refill, clean breather, and replace filter element

EVERY 6 MONTHS OR 1500 HOURS

Hydraulic System	Drain and refill; clean reservoir breather
Drop Box Transmission	Drain and refill, clean breather
Differentials	Drain and refill; clean or replace magnetic drain plugs; clean breather
Planetary Hubs	Drain and refill
Steering Knuckles (Rzeppa joints only)	Disassemble and repack with grease
Swing Gearbox	Drain and refill; clean breather
Batteries	Clean battery case, posts and clamps
Radiator and Cooling System	Drain, flush and refill

ANNUALLY

Air Compressor	Disassemble, clean and inspect cylinder head and components
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SERVICE CHART

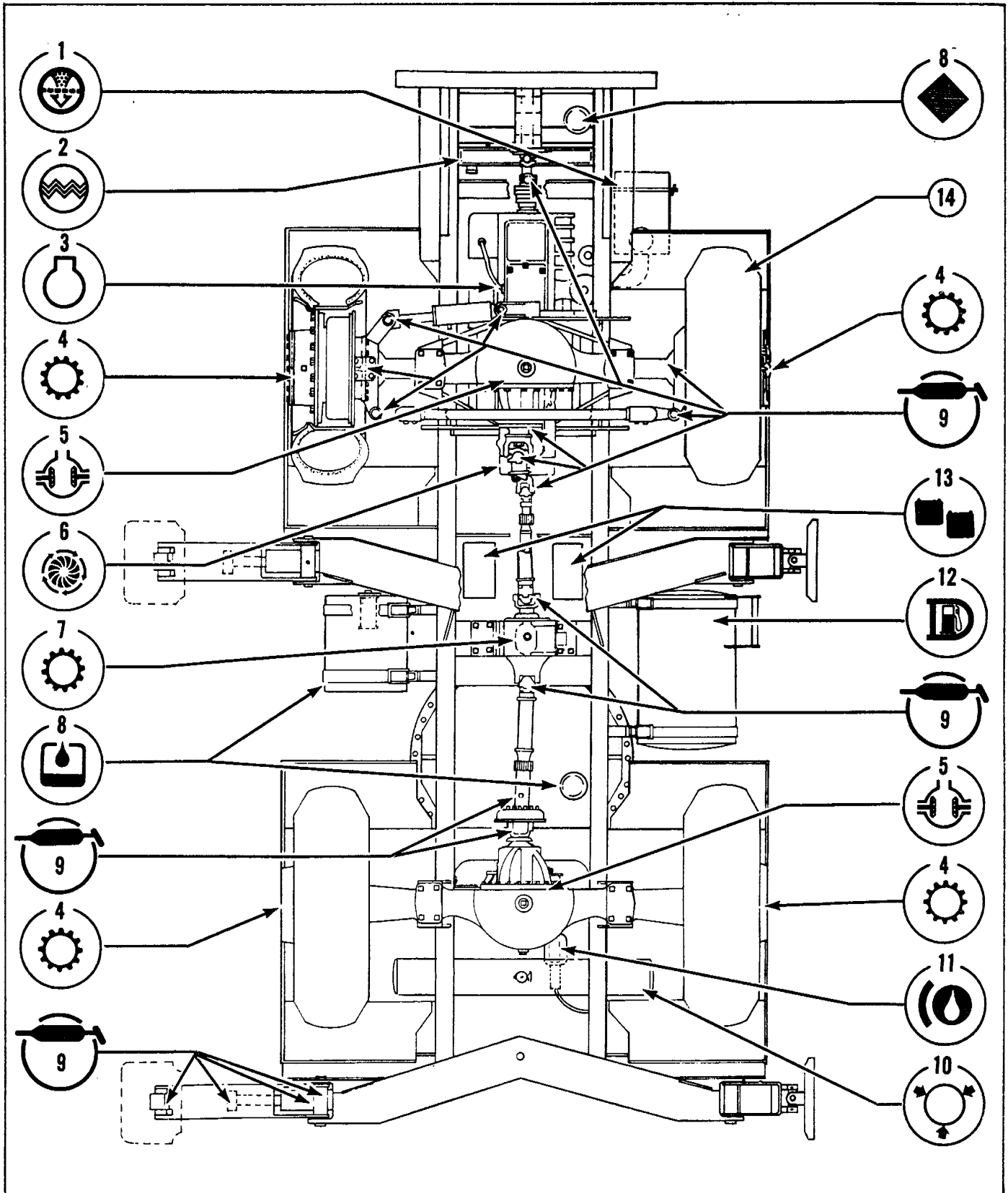


Figure 4. Service Points on Lower Structure

SERVICE CHART

1. **ENGINE AIR CLEANER** - Daily or every 10 hours check air restriction indicator. Every 2 weeks or 100 hours clean or replace element. (See page 16).
2. **RADIATOR AND COOLING SYSTEM** - Daily or every 10 hours check coolant level and fill. Every 6 months or 1500 hours drain and flush system. (See page 15).
3. **ENGINE** - See engine manufacturer's manual.
4. **PLANETARY HUBS** - Weekly or every 50 hours check oil level and fill. Every 6 months or 1500 hours drain and refill. (See page 32).
5. **DIFFERENTIALS** - Weekly or every 50 hours check oil level and fill. Every 6 months or 1500 hours drain and refill; clean breather and magnetic drain plug (See page 32).
6. **TORQUE CONVERTER and FORWARD-REVERSE UNIT** - Weekly or every 50 hours check fluid level and fill. Every 2 months or 500 hours drain and refill unit, clean breather and replace filter. (See page 23).
7. **DROP BOX TRANSMISSION** - Weekly or every 50 hours check oil level and fill. Every 6 months or 1500 hours drain and refill unit and clean breather. (See page 29).
8. **HYDRAULIC SYSTEM and FILTERS** - Daily or every 10 hours check fluid level and fill. Every 2 months or 500 hours clean 100 mesh screen filter (in-line) and replace paper filter. Every 6 months or 1500 hours drain and refill system, clean reservoir breather and screen filter, and service in-line filters. (See page 130).
9. **LUBRICATION FITTINGS** - Grease all lubrication points according to intervals given in Pictorial Listing on Page 13. Use Lithium Base EP No. 2 bearing grease or functional equivalent.
10. **AIR SYSTEM** - Daily or every 10 hours (at end of each shift) drain moisture and oil buildup in air reservoir. Every 2 months or 500 hours clean or replace air compressor strainer. Annually overhaul compressor. (See page 98).
11. **BRAKE MASTER CYLINDER** - Weekly or every 50 hours check fluid level and fill. (See page 100).
12. **FUEL TANK** - Daily or every 10 hours fill at end of shift to prevent condensation. (See engine manual).
13. **BATTERIES** - Weekly or every 50 hours check electrolyte level and fill. Every 6 months or 1500 hours clean posts and connections. (See page 116).
14. **TIRES** - Daily or every 10 hours check pressures. Keep inflated to 65 psi (390 kPa). (See page 34).
15. **SWING GEARBOX and TURNTABLE OPEN GEAR** - Daily or every 10 hours lubricate open gear with a spray-on lubricant such as Mobil Mobiltac-E, Sohio Sohitac No. 1, Texaco Crater Compound or functional equivalent. Weekly or every 50 hours check oil level in swing gearbox. Every 6 months or 1500 hours drain and refill gearbox and clean breather. (See page 38).
16. **TURNTABLE BEARING and CAPSCREWS** - Weekly or every 50 hours grease bearing through central lube point in Cab (See Pictorial Listing) while slowly rotating turntable through several revolutions. Monthly or every 250 hours check torque on bearing capscrews. (See page 38).
17. **ACCELERATOR MASTER CYLINDER** - Weekly or every 50 hours check fluid level and fill. (See page 19).
18. **OPERATOR'S CAB** - Daily or every 10 hours clean thoroughly. (See Cleaning of Soundproofing Insulation on page 7).

SERVICE CHART

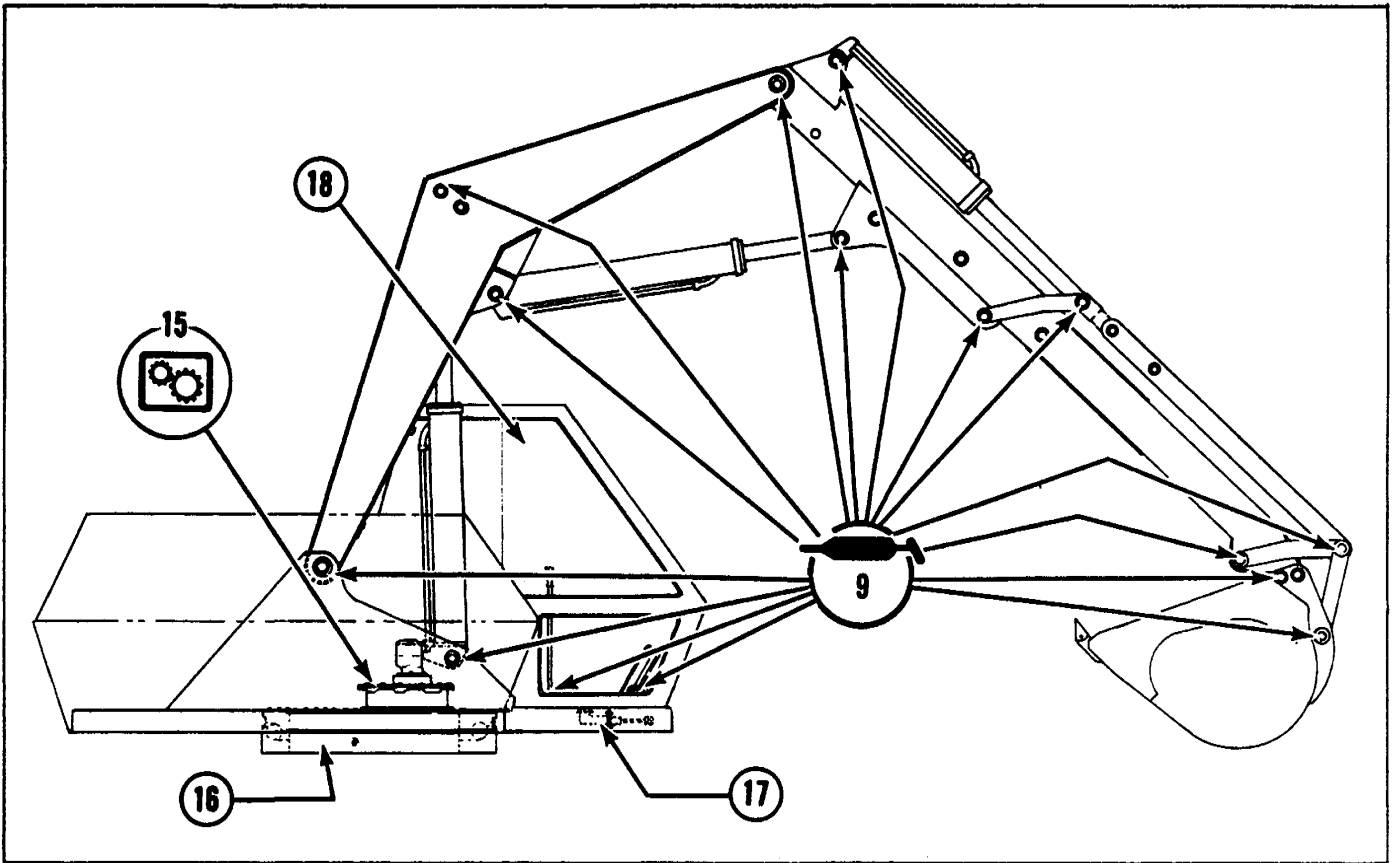


Figure 5. Service Points on Upperstructure and "Y" Boom

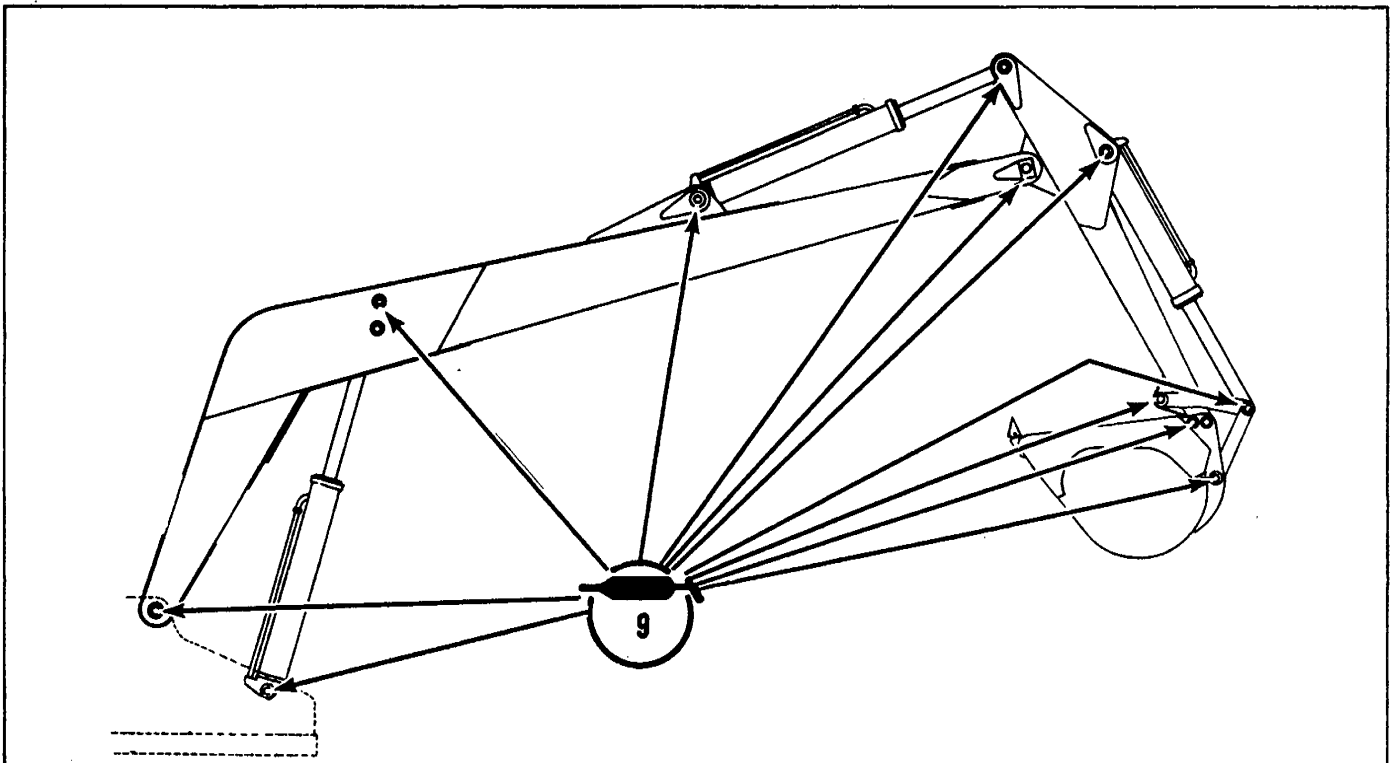


Figure 6. Service Points on "E" Boom

PICTORIAL LISTING OF GREASE FITTINGS

REF.	LOCATION/TITLE	QTY.	INTERVAL
7	Turntable Bearing Central Lube Point	1	Weekly/50 hours
8	Controls in Cab	8	Weekly/50 hours
9	Linkages Under Cab	11	Weekly/50 hours
10	Shift Linkage Under Chassis	1 per linkage	Weekly/50 hours
10	Drive Shafts	3 per shaft	
11	Shift Linkage Above Center Swivel	1 per linkage	Weekly/50 hours
11	Center Swivel	2	Bi-monthly/500 hours
12	Front Axle pivots	2	Weekly/50 hours
	Axle lockouts	2	
	Steering cylinder	2	
	Steering knuckles	2	
13	Tie Rod ends	2	Weekly/50 hours
14	Outriggers	4 per outrigger	Weekly/50 hours
6	E Boom	11	Daily/10 hours
5	Y Boom	13	Daily/10 hours

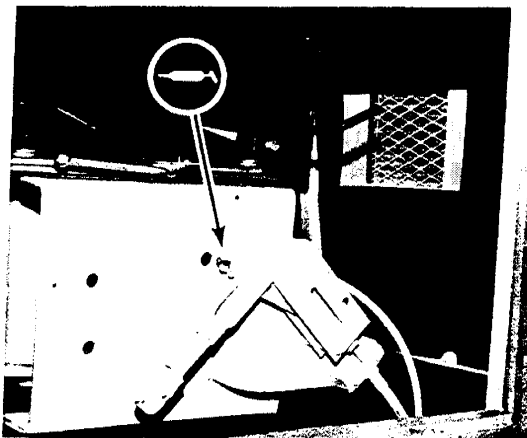


Figure 7.

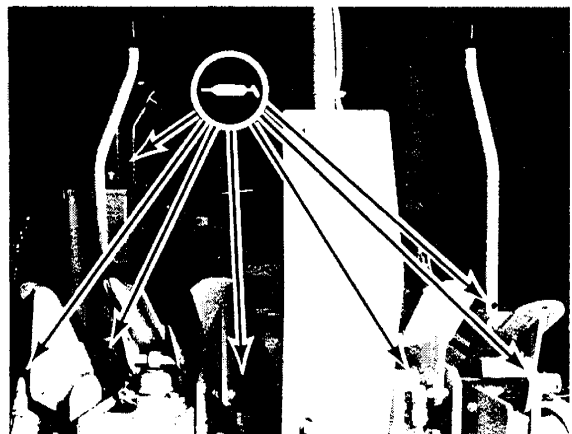


Figure 8.

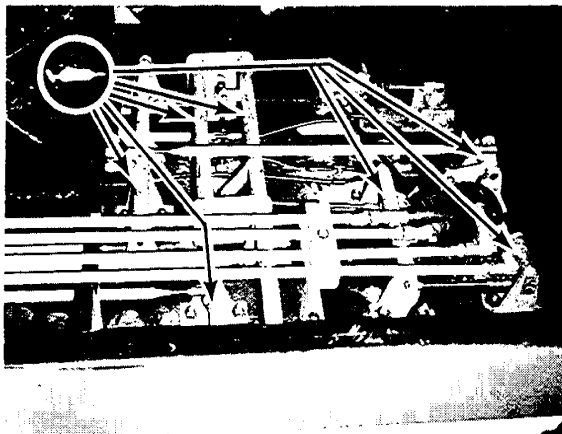


Figure 9.

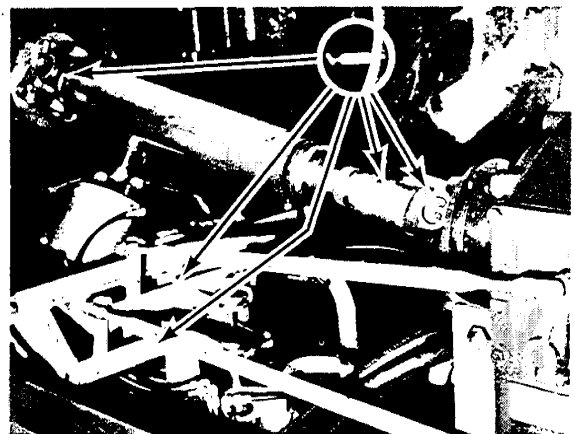


Figure 10.

PICTORIAL LISTING OF GREASE FITTINGS

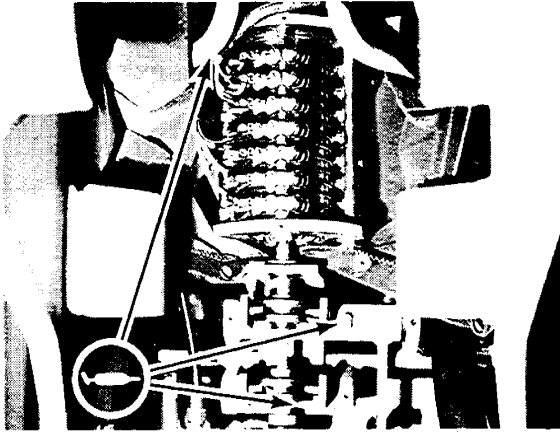


Figure 11.

Shifting Linkage Tubes: Weekly or every 50 hours, lubricate the shift tubes which run down through the center swivel with a dry lubricant such as Dri-Slide or its functional equivalent. Do NOT use oil or wet lubricant because the tubes will stick and result in poor shifting.

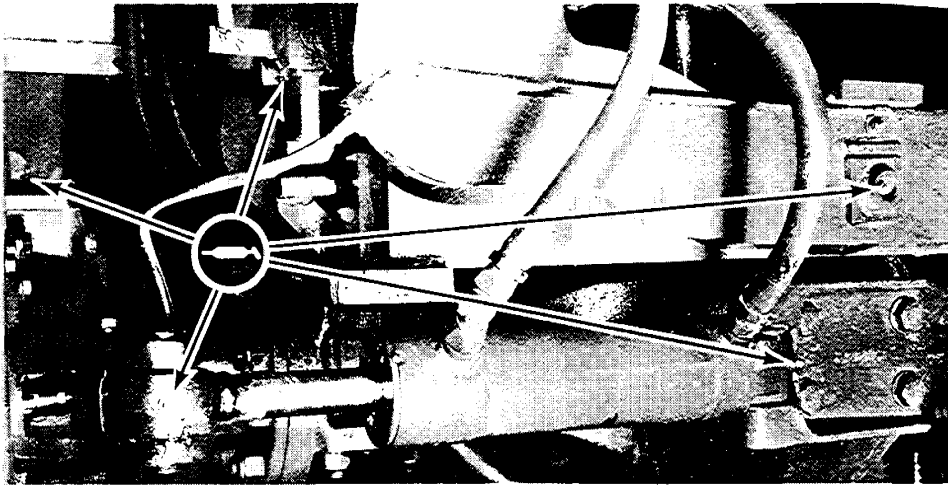


Figure 12.

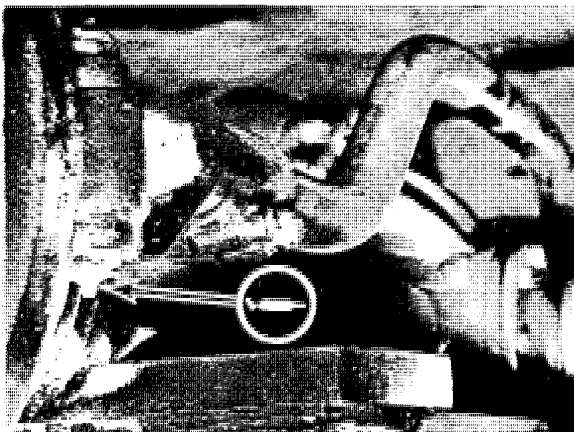


Figure 13.

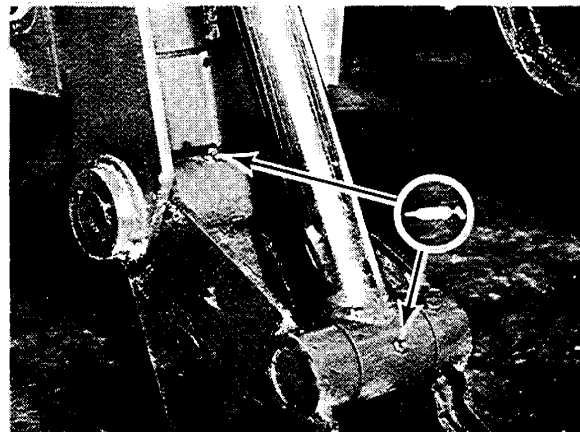


Figure 14.

SECTION 2

THE MECHANICAL SYSTEM

DESCRIPTION, MAINTENANCE AND TROUBLESHOOTING

Introduction

The Mechanical System includes the complete power train, the turntable bearing and swing mechanism, and those components of the lower and upper structures which are not integral parts of the air, electrical or hydraulic systems. Some of these components will be covered again in later sections and will be only briefly discussed here.

Component Listing:

1. Engine and Related Items
2. Torque Converter and Forward/Reverse Unit and Shift Linkage
3. Drop Box Transmission and Shift Linkage
4. Axles (Includes brakes, steering and oscillation lockout)
5. The Turntable Swing
6. Boom and Attachments

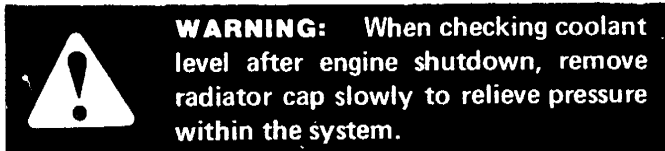
1. Engine and Related Items

ENGINE MAINTENANCE AND SERVICE

Engine maintenance is covered in the separate engine manual which accompanies each machine. Refer to the engine manual for specifications, maintenance, tune-ups and governor adjustments. For major servicing and overhaul, contact your nearest engine distributor.

ENGINE COOLING SYSTEM

To ensure proper engine operating temperatures, the entire cooling system should be checked daily. Coolant level should be within 2" (50 mm) of top of filler neck.



If coolant level is consistently low, check for leaks in the radiator, connecting hoses or water pump.

Clean radiator fins periodically. Use compressed air to blow out dust accumulations and other obstacles. Check fan belts regularly for frays, proper tension and alignment.

Drain and flush the cooling system twice a year, preferably Spring and Fall. Use the following procedure:

1. Open petcock on radiator and engine block. Allow system to drain.
2. Close petcocks, then refill system with clear water.
3. Run engine for approximately fifteen minutes to circulate the water throughout the system.
4. Drain system, then refill with recommended coolant (See below).

IMPORTANT: If engine is still hot, refill slowly to prevent rapid cooling and distortion of engine castings.

5. Run engine for several minutes to circulate the coolant and remove entrapped air. Recheck coolant level. Add coolant as needed.

Coolant Recommendations

When shipped from the factory, the cooling system on the CRUZ-AIR is filled with permanent type anti-freeze solution of 1/2 water and 1/2 ethylene glycol base. Any high boiling point type anti-freeze will work equally well. However, sealant type anti-freeze should be avoided.

IMPORTANT: Anti-freeze with sealer additives is not recommended for use with the Detroit Diesel engine because plugging can develop throughout the cooling system passages.

Corrosion Inhibitors

A non-chromate type inhibitor should be used with either water or ethylene glycol base solution to retard rust and scale buildup within the cooling system. Borates, nitrates and nitrites are acceptable corrosion inhibitors. Do NOT use chromates or soluble oil as a corrosion inhibitor.

All corrosion inhibitors, no matter what type being used, will dissipate under normal operating conditions and should therefore be replenished at approximately 500 hour intervals.

ENGINE AIR CLEANER

The air cleaner is designed to filter the air needed by the engine for combustion. Loose connections, damaged hoses or a clogged filter element defeat the purpose of the air cleaner and can result in extensive wear on the engine.

Scheduled Maintenance

A Restriction Indicator is installed in the air inlet line to the engine (see figure 15). The Indicator works on a vacuum principle and gives a visual indication of the amount of restriction encountered in the air cleaner. Check the Indicator Daily. When the Indicator reaches the YELLOW area, remove and clean or replace the air cleaner element. Never permit the Indicator to reach the RED zone, as this indicates severe restriction which can damage the engine.

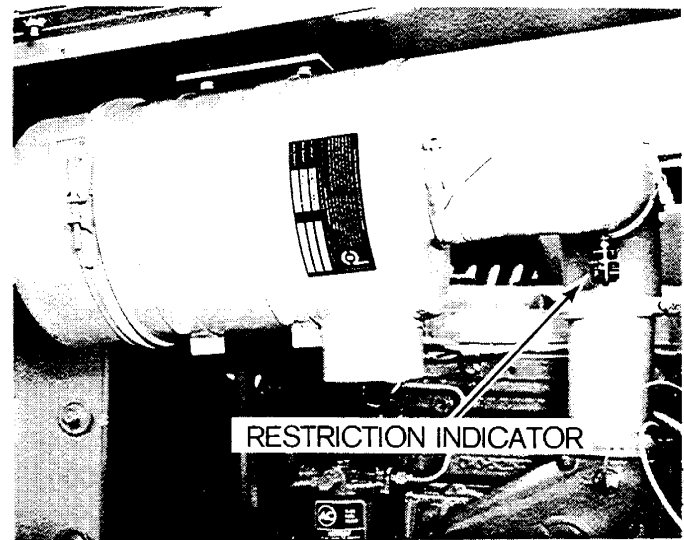


Figure 15. Air Cleaner and Restriction Indicator

NOTE: After air cleaner is serviced, the Air Restriction Indicator must be re-set by pressing button on bottom of indicator.

To ensure peak engine performance and fuel economy, service the air cleaner every two weeks or 100 hours. Extremely dusty conditions call for even shorter intervals between service.

To service the air cleaner, use the following procedure:

1. Loosen clamps, then remove dust cup.
2. Remove wing screw and washer. Carefully remove element and baffle assembly.

NOTE: If element is to be reused, handle with care to prevent damage or rupture.

3. Use a clean, damp cloth to wipe out dust cup and inside of air cleaner housing.
4. Clean or replace the element. Reassemble the air cleaner. For cleaning instructions, see page 17.

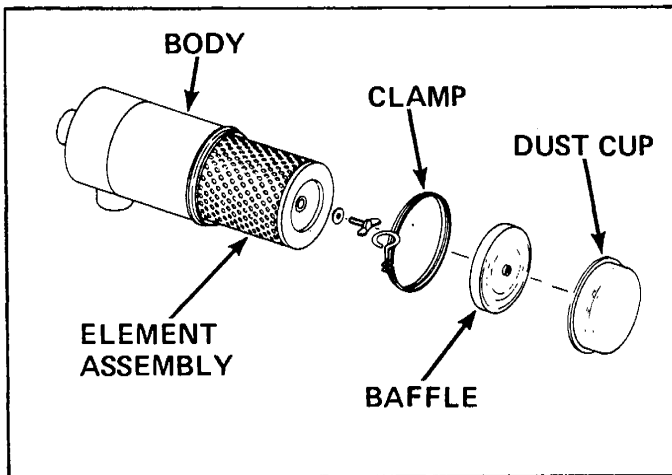


Figure 16. Exploded View of Air Cleaner

Cleaning Air Cleaner Element

The Air cleaner element may be cleaned with compressed air, by washing, or a combination of both.

Compressed Air Cleaning: If dust is the main contaminant, compressed air will adequately reclaim the element to near new service capability. This method will provide partial cleaning for soot or carbon laden elements.

NOTE: Nozzle pressure should not exceed 100 psi (690 kPa). Take care that the paper is not ruptured by the nozzle or air jet.

The nozzle should be kept at least one inch away from element. Do not remove the plastic fin and warp assembly from the element. Adequate cleaning can be accomplished with the fin in place. Removal can damage the element assembly.

To clean, direct a stream of compressed air through the element from the clean (inside) side out (opposite direction of normal air flow). Move the air jet up and down the pleat while slowly rotating the element. Continue until all dust is removed.

After cleaning, hold a lighted bulb inside the element and INSPECT for holes or ruptures which will show up as bright spots. Replace element if it appears damaged in any way.

Washing Method: The washing method should be used on carbon or soot laden elements. Before washing, use compressed air or gentle stream of water (less than 40 psi [275 kPa]) to remove loose dirt from element.

Use either an automotive type filter element cleaner (available at any automotive supply store) or a light solution of non-sudsing detergent. Prepare enough solution to cover the element in the container being used.

SOAK the element in the solution for a minimum of 15 minutes, but no longer than 24 hours. To help remove dirt, swish the element in the solution.

RINSE element, starting from clean side (inside) then from both sides with a gentle stream of water to remove all suds and dirt.

DRY element before re-use. Use warm circulating air. Do NOT use a light bulb to dry the element, as high surface temperatures can burn or scorch the paper.

INSPECT element after drying. Hold a lighted bulb inside and check for light spots which indicate worn or weak areas. Do not re-use damaged elements.

NOTE: Element may be dried faster if it is installed and the engine run (away from dust) for about 10 minutes.

Storage:

If element is not to be re-used immediately, store in a dust free place.

NOTE: Air cleaner element should be replaced after every 5 cleanings. See your DROTT dealer. To eliminate unnecessary downtime, keep a spare on hand at all times.

IMPORTANT: NEVER run an engine with dust cup or element removed.

ENGINE PERFORMANCE

Engine performance will affect total machine operation. To ensure peak engine performance, the throttle linkage must be properly maintained and adjusted.

ENGINE CONVERTER STALL CHART (RPM)			
HIGH	LOW	GOVERNED	STALL
2585	550-600	2400	1740

Engine Performance Check

NOTE: The engine should be warmed to operating temperature before any performance checks are made.

To check engine rpm, use a strob-tachometer aimed at a chalk mark on engine crankshaft pulley. Connect the RED wire of the strob-tachometer to the Positive (+) or "hot" battery terminal, and the BLACK wire to the Negative (-) or "ground" battery terminal. With engine running, aim the timing light at chalk mark on engine crankshaft pulley, then adjust strob-tachometer until timing light "stops" chalk mark. Read tachometer.

NOTE: Maximum governed rpm is determined by running engine at full throttle under minimum load conditions (all controls in neutral).

If throttle linkage is suspected of malfunctioning, disconnect it and work the governor lever by hand. Check engine speeds obtained in this way against speeds obtained with throttle linkage connected.

THROTTLE LINKAGE

The throttle linkage on the 40 CRUZ-AIR basically consists of a master cylinder hydraulically linked to a slave cylinder. The master cylinder is located under the operator's cab and controlled by the accelerator pedal. A single hydraulic line extends from the master cylinder and runs down through the center swivel to the slave cylinder mounted on the engine. The slave cylinder in turn is connected to the governor lever which controls engine speed.

Operation

When the accelerator pedal is depressed, hydraulic brake fluid is forced from the master cylinder through the connecting line to the slave cylinder and

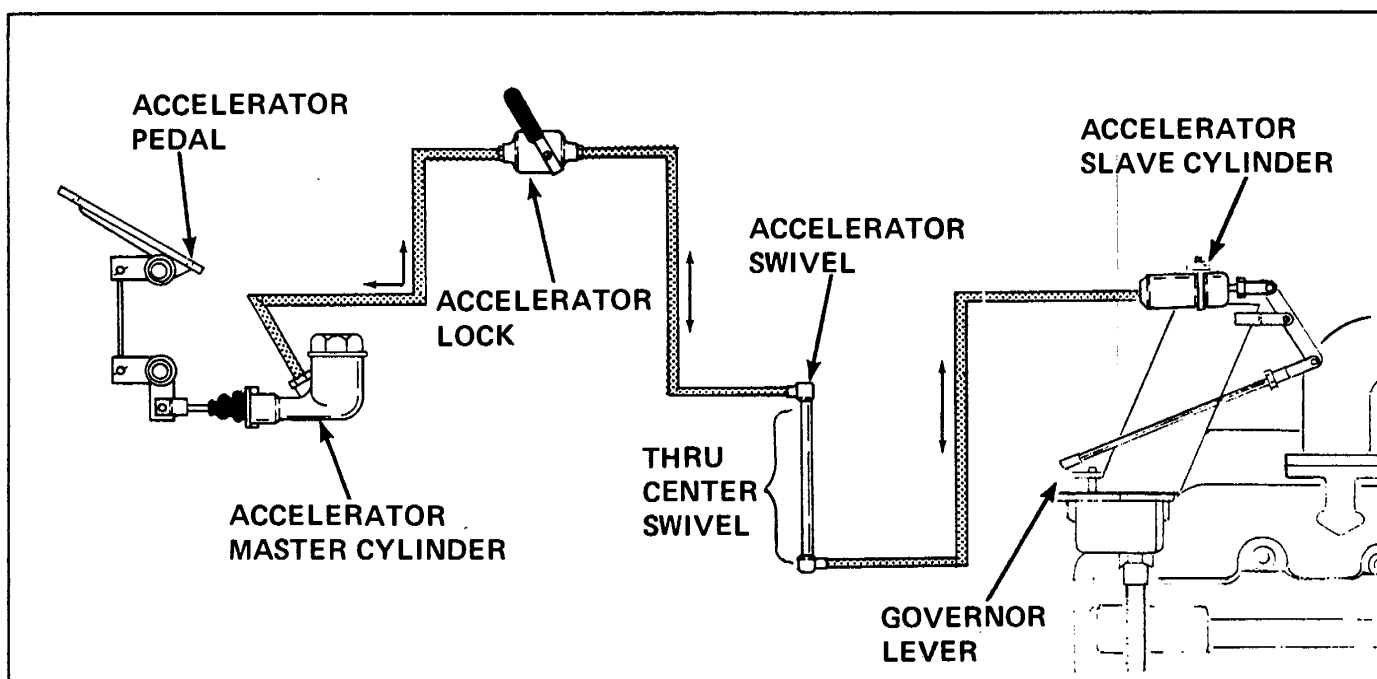


Figure 17. Throttle Linkage Diagram

causes the slave cylinder plunger to move outwards. When the pedal is released, spring force causes the slave cylinder plunger to return to its original position, forcing the hydraulic brake fluid back to the master cylinder.

An accelerator lock is installed in the line between the master cylinder and the center swivel. The accelerator lock is simply a manual ON/OFF valve which blocks the free flow of fluid between the master cylinder and the slave cylinder. When the operator desires to set engine speed, he depresses the accelerator pedal until the desired rpm is reached, then flips the valve to its "lock" position and releases the pedal. The valve "holds" the engine at the desired rpm by preventing the fluid originally forced into the slave cylinder from returning to the master cylinder.

Scheduled Maintenance

Check fluid level in master cylinder once a week or every 50 hours. An access hole is provided in the floor of the operator's Cab. To check fluid level, roll back the floor mat in right front corner of cab, remove access hole cover, clean around master cylinder fill cap, then remove cap. Level should be maintained to within 1/4" (6.3 mm) of top of reservoir. If low, add Type "A", Suffix "A" brake fluid.

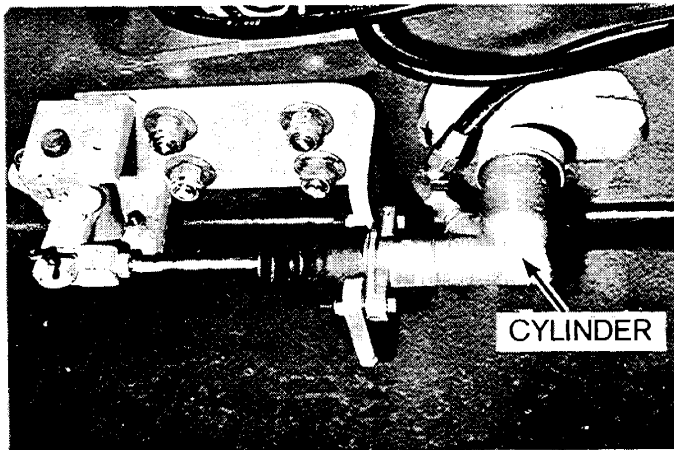


Figure 18. Accelerator Master Cylinder

Linkage Adjustment

Two adjustments are possible on the throttle linkage - one at the master cylinder and one at the slave cylinder.

At the master cylinder to change pedal angle to suit the operator, loosen jam nut on the master cylinder pushrod (figure 18), turn adjustment nut clockwise or counterclockwise as required, then re-tighten jam nut.

At the slave cylinder, to change engine rpm range, loosen jam nut on yoke on either the slave cylinder pushrod or the connecting rod, then turn the yoke either IN or OUT as required to obtain the recommended rpm range (See Stall Chart). Tighten jam nut after adjustment is complete.

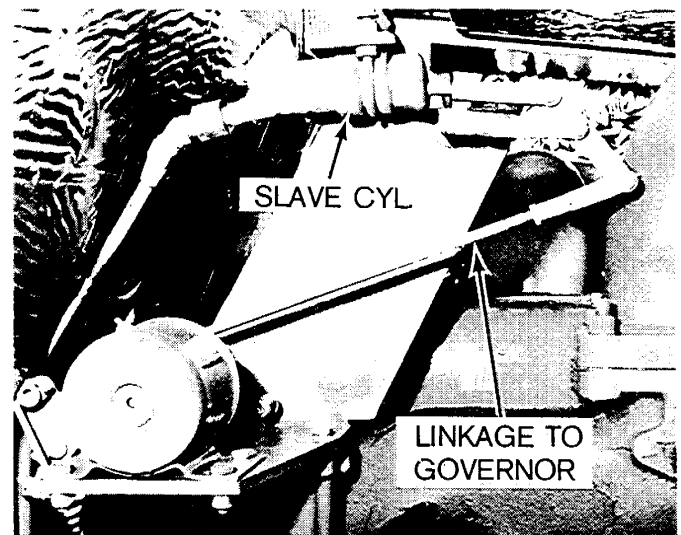


Figure 19. Accelerator Slave Cylinder on Engine

Bleeding Procedure for Accelerator Linkage

If accelerator feels spongy, and engine response seems sluggish, the hydraulic line may need bleeding. This can be done either with a pressure bleeder, or with the accelerator pedal. The Accelerator slave cylinder has a bleed fitting.

To bleed the accelerator system, use the following procedure:

1. Thoroughly clean around the bleed fitting in the slave cylinder. Clean dirt from around master cylinder filler cap.
2. Be sure master cylinder reservoir is full of Type "A" Brake Fluid that is free of air bubbles.

3. If a pressure bleeder is used, be sure it contains sufficient fluid. Insert the proper adapter on the master cylinder filler opening and connect the hydraulic hose from the pressure bleeder to the adapter. Charge the bleeder with air (20 psi or 140 kPa max.).
4. Slip a hose over the end of the bleed fitting on the slave cylinder. Submerge the other end in a glass jar partly filled with brake fluid, so that air bubbles escaping from hydraulic system can be seen.
5. Open bleed fitting on slave cylinder, then open pressure bleeder supply valve and permit fluid to flow from the accelerator system until bubbles are no longer visible in the glass jar.
6. Close the bleed fitting on the slave cylinder.
7. Close pressure-bleeder supply valve and remove hose and adapter from master cylinder fill port (if pressure bleeder was used). Fill master cylinder reservoir with clean fluid to within 1/4" (6.3 mm) of top. Replace cap.

NOTE: If frequent bleeding is required, check system for leaks, look for dark accumulations of dirt around line connections.

NOTE: If accelerator response is still sluggish, it is possible the line leading to the swivel may need bleeding. To bleed this line, use the procedure below.

Bleeding Accelerator Swivel Line:

1. Pump up pressure using accelerator pedal. Place a heavy weight on the pedal to keep the pressure in the line. Pumping the accelerator pedal should create enough pressure for proper bleeding.
2. Crack the accelerator hydraulic line at the top swivel fitting to bleed air out of the line. Close fitting and re-tighten. Remove weight from accelerator and test for proper response.

TROUBLESHOOTING GUIDE - ENGINE

PROBLEM	POSSIBLE CAUSE	REMEDY
A. Engine lacks power, stalls at idle speed	<ol style="list-style-type: none"> 1. Clogged air cleaner 2. Engine needs tune-up 	<ol style="list-style-type: none"> 1. Remove and clean or replace element 2. See engine manual
B. Engine overheats	<ol style="list-style-type: none"> 1. Insufficient coolant or dirty fins 2. Defective thermostat 3. Insufficient lubricating oil 	<ol style="list-style-type: none"> 1. Check coolant level and fan belts; clean fins 2. Replace, see engine manual 3. Add oil, see engine manual
C. Engine does not develop full rpm	<ol style="list-style-type: none"> 1. Low fluid in accelerator master cylinder 2. Accelerator linkage out of adjustment 3. Engine needs tune-up 	<ol style="list-style-type: none"> 1. Check; refill if necessary 2. Adjust linkage to governor 3. See engine manual
D. Engine responds sluggishly when accelerator pedal is depressed	<ol style="list-style-type: none"> 1. Air in hydraulic linkage 2. Accelerator lock not fully disengaged 3. Worn or defective master or slave cylinder 4. Defective fuel system 	<ol style="list-style-type: none"> 1. Bleed accelerator system 2. Check and correct 3. Disassemble and repair or replace item found defective 4. See engine manual
E. Engine won't start	<ol style="list-style-type: none"> 1. Faulty cranking system 2. Faulty fuel system 	<ol style="list-style-type: none"> 1. See engine manual and Electrical System 2. See engine manual