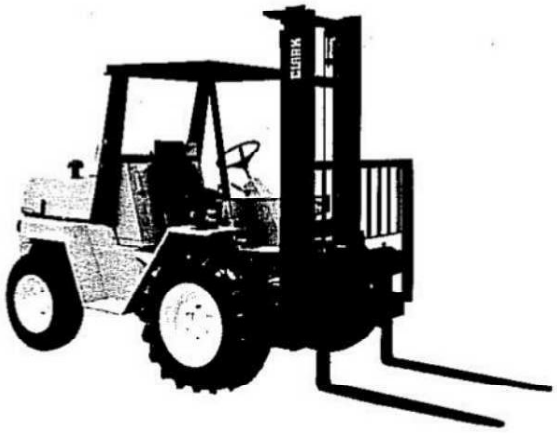
CLARK Material Systems Technology Company

ADJUSTMENT AND REPAIR MANUAL



Diesel
Rough Terrain
Lift Trucks

DPR 20/25/30

Rated Capacity: 2000/2500/3000 kg
4,000/5,000/6,000 lbs

BOOK NO. OH-533

TABLE OF CONTENTS

3 - EVERY 150 HOURS OPERATION

A - ENGINE OIL AND OIL FILTER CHANGE

. These operations must be carried out with the forklift in a horizontal position engine stopped.

. Start the engine; bring it to operating temperature then stop it.

. Put a pan under the bleed plug 1 (Fig. 3-A1) of the lower sump. Loosen and remove this plug and let all the oil out. To speed up the bleeding operation remove filling plug 2 (Fig. 3-A2).

. Then change the engine oil filter element. Procede as follows:

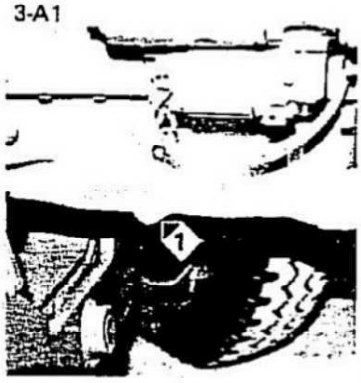
- Unscrew the filtration element 3 (Fig. 3-A3) discard it along with the seal.
- Mount the new element 3 (Fig. 3-A3) after having cleaned the engine mount with a clean lint-free rag. Don't forget to slightly oil the filter seal.

IMPORTANT : Mount the new oil filter by hand only ; never use a tool.

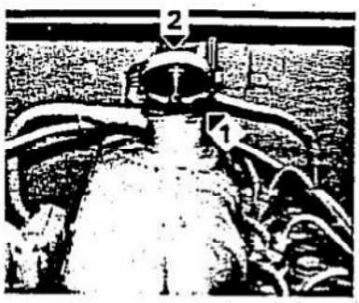
. Remount and tighten bleed plug 1 (Fig. 3-A1) after having changed its seal. Fill the sump with oil through filling hole 1 (Fig. 3-A2) (see chapter: "OILS - GREASE - LIQUIDS - FUEL - FILTERS"). Wait a few minutes, then using dip-stick 5 (Fig. 3-A3) check level that should register at top notch. Re-insert dip-stick 5 (Fig. 3-A3) and remount filling plug 2 (Fig. 3-A2).

. Run the engine at half throttle for a few minutes, then check the oil filter seal for leaks 3 (Fig. 3-A3). Stop the engine. Wait a few minutes; check level again and top up if necessary.

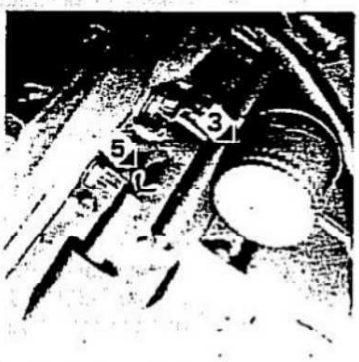
3-A1



3-A2



3-A3



B - CLEANING THE AIR FILTER CARTRIDGE

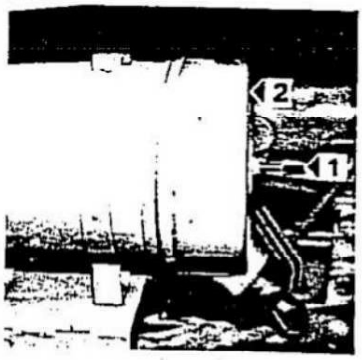
. Unscrew knob 1 (Fig. 3-B1) then remove cover 2 (Fig. 3-B1). Unscrew nut 3 (Fig. 3-B2) that holds cartridge.

. With a jet of compressed air, clean the filtration cartridge from the inside towards the outside only.

. Clean the inner part of the filter with a clean damp lint-free rag while protecting the engine intake pipe. **NEVER USE COMPRESSED AIR.**

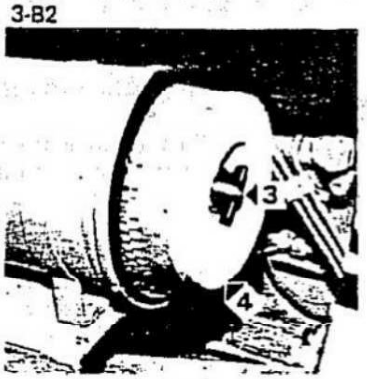
. Check the condition of the filtration cartridge and seals. A damaged cartridge should be changed immediately.

3-B1



. Re-insert cartridge 4 (Fig. 3-B2) into filter housing. Secure it and tighten with nut 3 (Fig. 3-B2) Remount covers 2 (Fig. 3-B1) with the valve towards the bottom and tighten it with nut 1 (Fig. 3-B1).

3-B2



VERY IMPORTANT : Never wash an air filter cartridge.

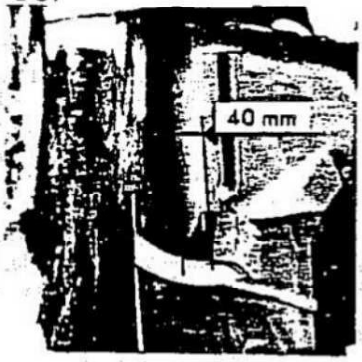
C - CHECKING AND ADJUSTING THE CLUTCH

When the clutch is correctly adjusted, the free stroke of the pedal, measured vertically from the cab floor, should be 1.57 in. (see Fig. 3-C1). When this stroke is not correct, carry out following adjustments:

Loosen clevis nuts 1 (Fig. 3-C2) and tighten on. Loosen rod 2 (Fig. 3-C2) to obtain desired setting. Then tighten clevis nuts 1 (Fig. 3-C2).

3-C2

3-C1



D - SERVICE BRAKE CHECKING AND ADJUSTMENT

When the brakes are correctly adjusted the free stroke of the pedal, measured vertically from the cab floor, should be 1.18 in. (See Fig. 3-D1). When this stroke is too important, adjustments should be made. To carry out this adjustment, procede as follows: (parking brake released)

. Block the rear wheels of the forklift and lift the front end so that wheels are free. To do so, check with your dealer.

. Loosen lock nuts 1 (Fig. 3-D2) on the right and left connecting rods 2 (Fig. 3-D2) and act on these to obtain a beginning of the braking function after the 1.18 in. stroke.

. Tighten lock nuts 1 (Fig. 3-D2) . Lower the forklift to the ground and release rear wheels.

. Check adjustment with no load and with a load and correct if necessary to obtain uniform and balanced braking.

3-D1

3-D2

E - CHECKING AND ADJUSTMENT OF PARKING BRAKE

Block the rear wheels of the forklift and lift the front end so that wheels are free. To carry out this operation check with your dealer.

To adjust, bring lever to position A (Fig. 3-E1); act on knob 1 (Fig. 3-E1) so that front wheels of the forklift are locked when lever is in position B (Fig. 3-E1).

Lower the forklift to the ground and release rear wheels.

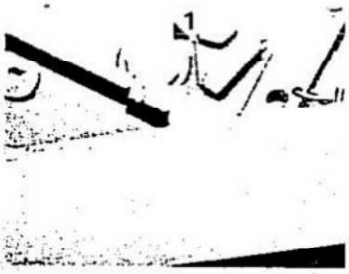
3-E1

F - OIL LEVEL IN TRANSMISSION SUMP

To check oil level make sure that forklift is in a horizontal position - engine stopped.

Remove level plug 1 (Fig. 3-F1). Oil level should be flush with lower part of hole. If not, unscrew filling plug 2 (Fig. 3-F2) and top up with oil (see chapter "OILS - GREASE - LIQUIDS - FUEL - FILTERS"). Remount and tighten plugs 1 (Fig. 3-F1) and 2 (Fig. 3-F2).

3-F1



3-F2

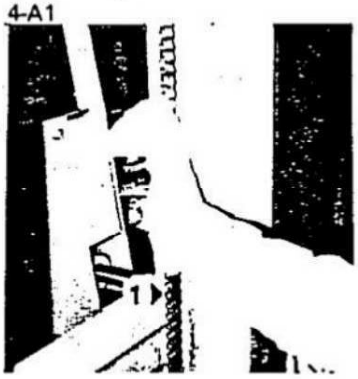
4 - EVERY 450 HOURS OPERATION

A - CHECKING, CLEANING AND LUBRICATION OF MAST RAISING CHAINS

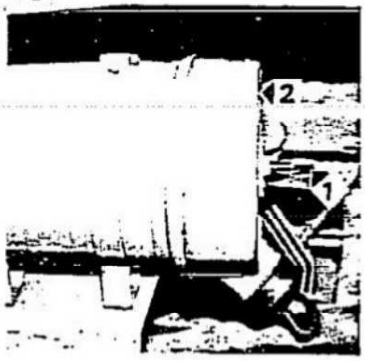
- Wipe mast raising chains 1 (Fig. 4-A1) with a clean rag and check them carefully to detect any wear spots.
- Clean the chains by brushing them thorougly to remove all foreign matter. Use a hand nylon brush and clean fuel.
- Rinse chains with a brush dipped in clean fuel. Dry them with compressed air.
- Apply oil to them (see chapter "OILS - GREASE - LIQUIDS - FUEL - FILTERS"). Wipe off any excess with a clean rag.

Above operation should be carried out over whole length of mast elevating chains.

4-A1



4-B1



B - CHANGING THE AIR FILTER CARTRIDGE

- Air used in the fuel combustion is purified in a dry air filter. It is therefore very important to never use the forklift with a damaged air filter or without an air filter.
- Unscrew nut 1 (Fig. 4-B1). Remove cover 2 (Fig. 4-B1). Then unscrew nut 3 (Fig. 3-B2) that holds filtering cartridge 4 (Fig. 4-B2). Remove and discard cartridge.
- Clean the inside of the filter with a clean damp lint-free rag. **NEVER USE COMPRESSED AIR.**
- Insert a new filtering cartridge 4 (Fig. 4-B2) and secure it with nut 3 (Fig. 4-B2). Remount lid 2 (Fig. 4-B1), valve at bottom and secure with nut 1 (Fig. 4-B1).
- When machine is used in a very dusty environment see chapter : "OILS - GREASE - LIQUIDS - FUEL - FILTERS" paragraph "ADDITIONAL AIR FILTER FOR DUSTY ENVIRONMENTS".

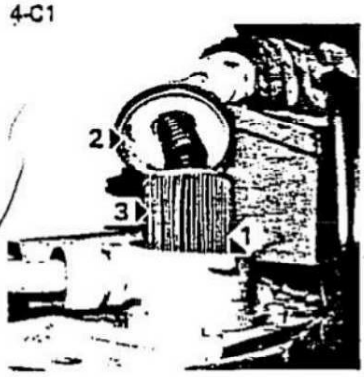
4-B2

C - CHANGING THE FILTER CARTRIDGE ON THE HYDRAULIC RETURN LINE

- Unscrew the 3 retainer screws 1 (Fig. 4-C1) and remove lid 2 (Fig. 4-C1). Remove used cartridge 3 (Fig. 4-C1) and mount new one.

CAUTION : Prior to remounting lid make sure that the cartridge is properly engaged.

4-C1



D - CHANGING FUEL FILTER CARTRIDGE

Close fuel tap 1 (Fig. 4-D1).

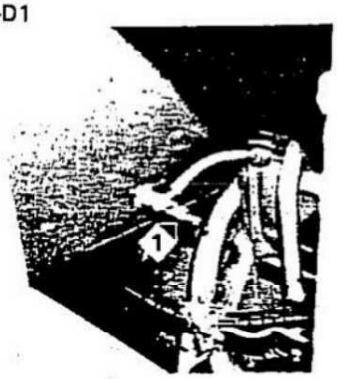
Clean the outside of the filters very carefully to prevent dust from getting into the system.

FILTER 1 (Fig. 4-D2):

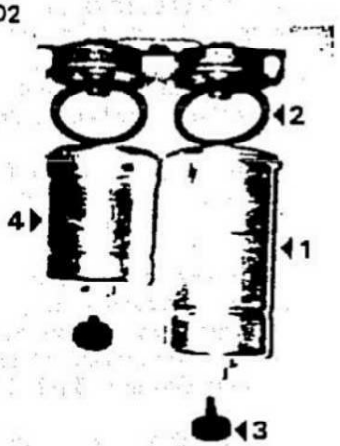
Unscrew filtering element 1 (Fig. 4-D2) by hand and discard along with seal 2 (Fig. 4-D2) and bleed plug 3 (Fig. 4-D2). Remount a new filtering element making sure that the seal is in the right position. Carry out same operation with Filter 4 (Fig. 4-D2).

Open tap 1 (Fig. 4-D1) and bleed fuel line; see chapter "EVERY DAY OR EVERY 10 HOURS OPERATION" paragraph "D - BLEEDING THE FUEL LINE".

4-D1



4-D2



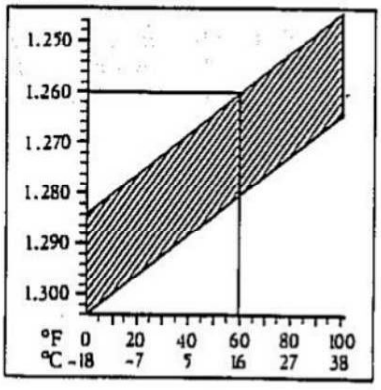
E - CHECKING BATTERY FLUID DENSITY

This check should be done with an acidimeter. It will also give an indication on the condition of the alternator.

Density varies according to temperature. However a minimum reading of 1260 at 60° F should be obtained. The battery is charged properly when the density recorded is situated in the grey area of the chart (Fig. 4-E1). Above this area, the battery should be recharged. Density should not vary by 0.025 units from one element to the other.

Never carry out this check after having added distilled water. Recharge battery and wait one hour prior to checking battery fluid density.

4-E1



5 - EVERY 900 HOURS OPERATION

A - CHECKING AND ADJUSTMENT OF ENGINE VALVE OPERATION

B - CHECKING AND ADJUSTMENT OF CYLINDER HEAD

C - CHECKING, CLEANING AND ADJUSTMENT OF INJECTORS

D - CHECKING, ADJUSTMENT AND LUBRICATION OF REAR WHEEL HUBS

For these 4 operations (chapters A - B - C - D), check with your dealer.

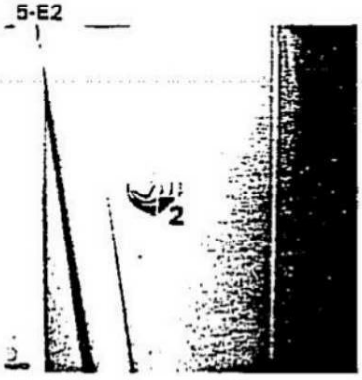
E - HYDRAULIC OIL CHANGE - CLEANING OF MAIN CIRCUIT AND STEERING CIRCUIT STRAINERS - CHANGING OIL TANK FILTERING CAP

These operations should be carried out with the forklift in a horizontal position-engine stopped - mast tilted towards rear and lowered all the way.

Remove filling cap 1 (Fig. 5-E1) and discard. Put pan under bleeding plug 2 (Fig. 5-E2) and remove plug. Let all oil out. When tank is empty remount and tighten bleed plug 2 (Fig. 5-E2).

5-E1

5-E2



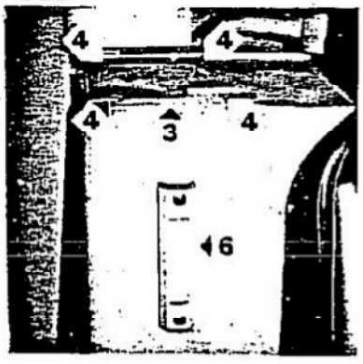
Remove inspection cover 3 (Fig. 5-E3) by unscrewing retainer screws 4 (Fig. 5-E3). Unscrew the 2 intake strainers situated at the bottom of the tank and remove them. Clean these strainers with compressed air. Check their condition and change them if necessary. Screw the 2 strainers back on and remount inspection cover 3 (Fig. 5-E3).

Fill tank with oil (see chapter "OILS - GREASE - LIQUIDS - FUEL - FILTERS") through filling hole 5 (Fig. 5-E1) until oil comes half way between upper and lower marks on gauge 6 (Fig. E-3). Remount a new filling cap.

Make sure that there are no leaks . Correct if necessary.

NOTE : It is sometime necessary to bleed the circuit at the main pump intake level, when air bubbles have entered the circuit during the oil change. If this happens check with your dealer.

5-E3



F - CHANGING THE TRANSMISSION SUMP OIL

Stop the forklift in a horizontal position and bleed oil while it is still hot.

Remove filling plug 1 (Fig. 5-F1). and level plug 2 (Fig. 5-F2) located on the left side of the transmission case. Put a pan under bleed plugs 3, 4 (Fig. 5-F3) and 5 (Fig. 5-F4) remove plugs.

5-F1

Clean plugs and seals, then, when oil has stopped flowing, remount bleed plugs 3,4 (Fig. 5-F3) and 5 (Fig. 5-F4).

Fill transmission sump slowly through filling hole 1 (Fig. 5-F1) with oil (see chapter "OILS - GREASE - LIQUIDS - FUEL - FILTERS"). Level is correct when it reaches the hole of level plug 2 (Fig. 5-F2). Remount and tighten level plug 2 (Fig. 5-F2) and filling plug 1 (Fig. 5-F1).

5-F2

5-F4

5-F3

G - BLEEDING AND CLEANING FUEL TANK

DANGER : Do not smoke while carrying out this operation. Do not carry out operation close to a flame.

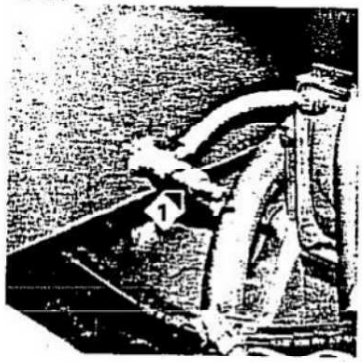
Close fuel tap 1 (Fig. 5-G1).

Remove bleed plug 2 (Fig. 5-G2) after having put a pan under it.

When fuel tank is empty, rince with 2.2 Imp. gal. of clean fuel, poured in through filling hole 3 (Fig. 5-G3). When tank has drained again, remount bleed plug 2 (Fig. 5-G2) and tighten.

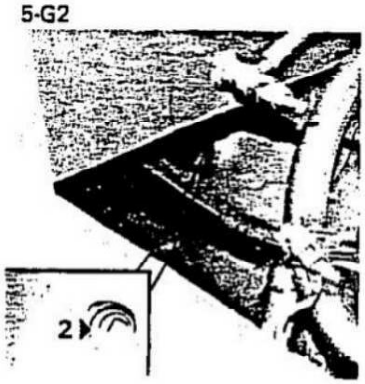
Fill tank with clean filtered fuel, through filling hole 3 (Fig. 5-G3) and bleed fuel line; see chapter : "1 - EVERY DAY OR EVERY 10 HOURS OPERATION" paragraph "D - BLEEDING THE FUEL LINE".

5-G1



5-G3

5-G2



BEFORE OR AFTER WINTER

A - COOLANT CHANGE

6-A1

This operation should be carried out with the forklift in a horizontal position - engine stopped and cold.

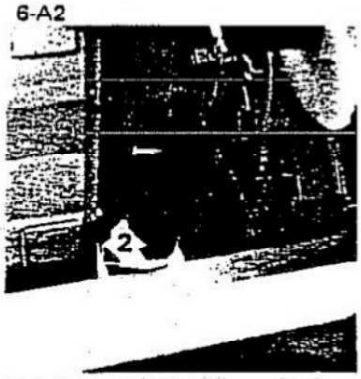
Remove the radiator filling plug 1 (Fig. 6-A1), radiator bleed plug 2 (Fig. 6-A2) and engine block bleed plug 3 (Fig. 6-A3). Bleed cooling circuit completely making sure that all holes remain unobstructed.

When circuit has drained completely, remount and tighten the radiator bleed plug 2 (Fig. 6-A2) and engine blockplug 3 (Fig. 6-A3).

Fill radiator slowly to allow air to exit and to allow coolant to fill the circuit completely up to 0.47 in. below lower part of filling neck 4 (Fig. 6-A1). Remount filling cap 1 (Fig. 6-A1).

Make sure that bleed plugs 2 (Fig. 6-A2) and 3 (Fig. 6-A3) do not leak. Run the engine for a few minutes. Recheck coolant level and top up if necessary.

6-A2



Recommended coolant :

Before winter, fill the cooling circuit with a solution of water and anti-freeze. The percentage of antifreeze should be determined according to ambiant temperatures (Fig. 6-A4).

At the end of winter, fill the cooling circuit with low mineral content water.

6-A4

FREEZING POINT ACCORDING TO PERCENTAGE OF ANTI-FREEZE	
Anti-Freeze Percentage	Temperature
25	+ 10.5° F
33.3	– 0.4° F
40	– 9.4° F
45	– 20.2° F
50	– 29.2° F
54	– 40.0° F
58	– 50.8° F
60	– 58.0° F

6-A3

B - BATTERY

6-B1

FREEZING POINT AT VARIOUS DENSITIES	
Density of Electrolyte	Temperature
1.100	+ 19.0° F
1.150	+ 1.0° F
1.160	– 5.0° F
1.200	– 16.0° F
1.250	– 59.8° F
1.280	– 90.4° F

The efficiency of the battery decreases proportionally to the decrease of temperature to become practically nil at – 40° F.

Chart (6-B1) shows the freezing points at various densities. It is therefore very important to maintain battery at maximum charge at all times.

Do not attempt to start the engine if the battery bas been exposed to –20.2°F temperatures. Battery should be reheated. To do this, immerse it into warm water up to 1.97 in. below plugs.

In cold weather, remove battery from the unit and store in a dry warm place until needed.