

# CHALLENGER 11

## Mid-life refurbishment

### Technical specifications (CCTP)

*Anthony VENDE - 03/10/2025 – Version 04*



## Sommaire

<b>1. PREAMBLE .....</b>	<b>2</b>
<b>2. WORK REQUIRED .....</b>	<b>2</b>
1) Engine compartment.....	2
Oil system .....	2
Cooling system .....	2
Starting motor .....	3
Alternator.....	3
2) Transmission .....	3
Gear box .....	3
Undercarriage.....	3
3) Cabin.....	3
Windscreen .....	3
4) Bonnet.....	6
5) Fuel tank.....	9
6) 40 kW generator.....	9
7) Light frame on the roof .....	10
8) 24V main switch .....	10
9) Trouble shooting.....	11

## 1. PREAMBLE

The Challenger N°11 arrived in Antarctica brand new in February 2010. Service in Antarctica is 8720 hours. This tractor is a MT865C "Traverse special". Serial number of the machine is **AGCC0865JNUKG1265**, and serial number of C18 engine is **EJG01566**.

It has been modified from original version to be able to work in Antarctica. All capabilities of the machine should be kept for this purpose after refurbishment, which means **special mounting, like seals for example, or special fluids, have to be maintained.**

The list below describes the work required to refurbish the machine in order to make it able to start a second life in Antarctica.

**However, this list is not exhaustive. If damaged parts not mentioned in the document are found, or if extra work is required, this has to be proposed to IPEV for approval.**

## 2. WORK REQUIRED

### 1) Engine compartment

The engine needs to be rebuild, everything checked, and additionally few upgrades are required for oil system, cooling system, starting motor and alternator.

Here is minimum work to be done for engine checking:

- Remove engine from chassis
- Remove cylinder head and components
- Inspect oil pump
- Replace turbo charger
- Replace water pump
- Inspect liners and piston and report
- Inspect camshaft and lifters
- Inspect crankshaft and bearings
- Replace injectors with reman
- Replace filters
- Check intercooler and coolant radiator
- Reassemble engine and reinstall in chassis

If additional work and parts are requested after inspection then it will be a separate quote.

Technician hours cost for extra work on engine have to be mentioned.

#### *Oil system*

Dismount additional oil tank and fit new oil pan for extra capacity – Total capacity requested is 60 litres. Caterpillar part number of the oil pan is: 2754261

#### *Cooling system*

Dismount original cooling fan system. Install variable drive fan "Horton RCV250" controlled by ECM.

### ***Starting motor***

Double 24V starting motor should be installed as a safety starting system.

### ***Alternator***

Relocate breakers near a side door like picture



## **2) Transmission**

### ***Gear box***

Gearbox should be dismantled and totally refurbished.

Something is wrong inside the gearbox, because the calibration can't be done anymore since 2 or 3 seasons.

Here is minimum work to be done for gearbox checking:

- Remove gearbox from chassis
- Open gearbox, inspect parts and report
- Replace all seals and wear parts
- Close gearbox
- Bench test the gearbox
- Reinstall gearbox to machine

If additional work and parts are requested after inspection then it will be a separate quote.

Technician hours cost for extra work on gearbox have to be mentioned.

### ***Undercarriage***

- 1) Refurbish undercarriage. Check wheels, bogies, bearings, seals, track belts ... renew as needed. Only rubber wheels are required. We do not want poly wheels.
- 2) Fit clear view cap on all wheels.

## **3) Cabin**

### ***Windscreen***

- 1) Renew the double glass windscreen. At least outside windscreen is broken.

2) Fit retainer/plate under the windscreen, to hold windscreen during sticking operation on the field. The support has to maintain all the weight of the glass during sticking operation, as we cannot move the cab on a side to have the glass maintained by its weight. Support should be removable, so we can dismount it when we use the tractor.



3) Fit retainer/screwed plate on the side of windscreen (same type than the windows) to help maintaining windscreen during handling.

Also, retainer that we can dismount are important as we need something to maintain the windscreen only during drying time.

4) Install film for sun protection around the cabin. It have to filter UV. See picture



**Good height all around the cab (15 cm).**

### ***Cabin interior design***

1) 12V indicators.

Fit one for each alternator, to help diagnosis in case of failure.





2) Rear camera.

Install a rear camera that gives view on the towing hook. It have to be fitted on the gearbox with a dedicated support. Add a screen dedicated in the cabin.



3) Fit a window heater on the rear window to avoid icing.

Be mindful that the headrest should not damage the wiring (see picture). Seat and/or headrest movement has to be restricted accordingly.



4) Retainer net

Fit an additional retainer net (part number: 513547D1) inside the cabin over the door.

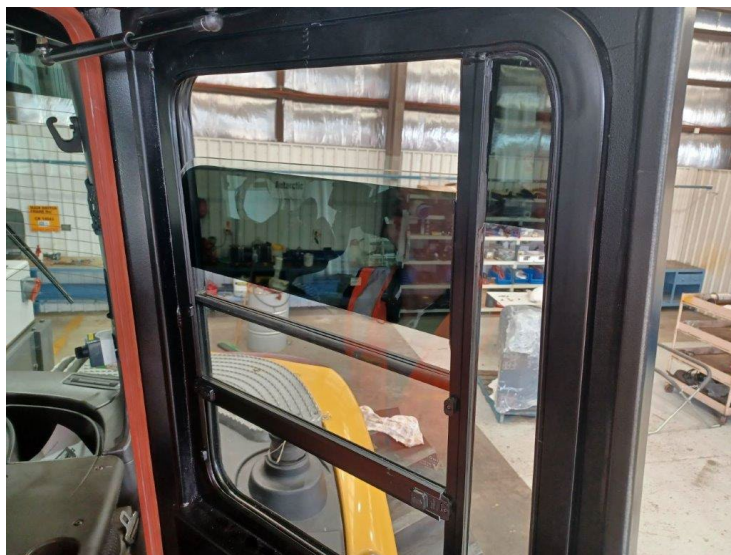
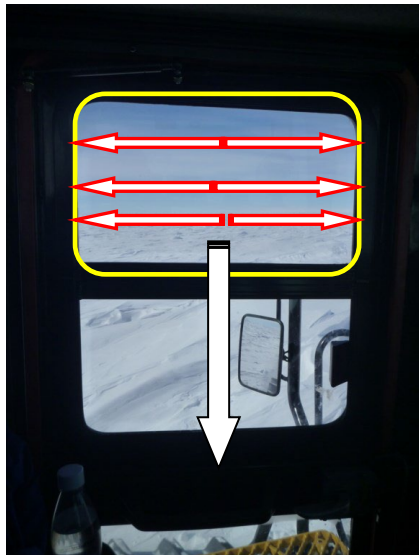




#### 5) Door windows opening

The sliding windows have to be modified because:

- The sliding windows should slide in the rail inside the cabin (ice outside can block the movement)
- We should be able to lock window in 3 different positions



#### 6) Silicon door seal protection

Install a plate or something to protect the silicon door seal, like on picture. Replace seal if required.



### Accessories

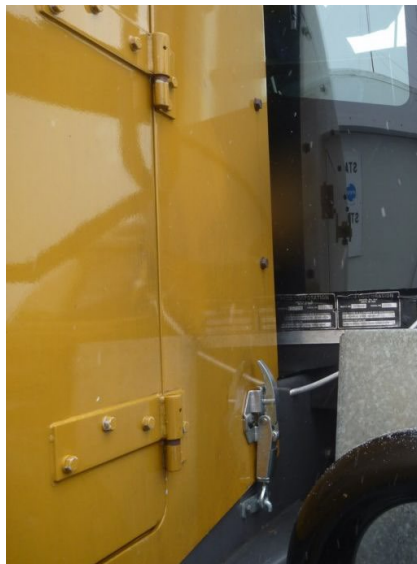
#### 4) Bonnet

- 1) Modify water deflector. Good design alike the one on pictures below, ***but it has to be well sealed*** with the bonnet otherwise it doesn't work.



## 2) Bonnet quick handle

Remove bolt on the side to maintain bonnet, and install quick handle like on picture.





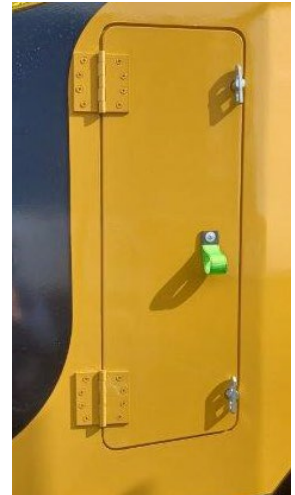
### 3) Top door

Same door and magnet locker than on the picture has to be done (see picture under)



### 4) Extra side doors

Install extra side doors like on pictures.



### 5) RHS door

Fit system to keep it open during use.



#### 6) Radiator blind

Same radiator blind than on the picture, with 2 buttons on the side of the bonnet for locking it using elastic.



#### 7) Bodywork and painting

The same quality of painting than original from the manufacturer is waited for all parts that will need to be painted after to be machined.

Regarding the engine bonnet, please precise:

- Cost of sandblasting
- Cost of primer work
- Cost of painting

### 5) Fuel tank

Fit extra fuel tank inside the chassis, to extend capacity by around 100 litres or more

### 6) 40 kW generator

Generator itself has to be checked, and refurbished (bearing, wiring,...).

Drive pulleys and all bearings of tension system have to be checked, and refurbished.



## 7) Light frame on the roof



Our light frame on the roof is around 200 kg and is maintained with only 4 bolts.

We require 4 additional bolts with spacers like on the picture. This means 4 holes have to be done in the roof cover. Aluminium chassis has to be modified like on the picture to receive additional bolts.

## 8) 24V main switch

Modify steel cover of main switch, as shown on pictures below

- Fit a steel hinge
- Fabricate handle
- Keep actual lock system.
- Red color painting requested





## 9) Trouble shooting

Here is a list of various malfunctions the tractor suffered before its shutdown for refurbishment. Those troubles have to be repaired before the delivery.

### **Electronic matters**

- Steering sensor error frequent (Code E395(2), 521470-1/1084-1) – Check and repair
- Armrest display to be checked. Selecting button very sensitive – Check and repair
- Frequent error on 4<sup>th</sup> hydraulic distributor (Electronic module damaged?) - – Check and repair
- Frequent exit of the "automatic rpm mode" with no action of the driver on any button of the armrest. We suspect a bad connection somewhere in the wiring as all buttons have been changed without success. – Check and repair

### **Other technical matters**

- On the gear lever, the locking system seems to not operate well. – Check and repair
- Load sensing valve on the hydraulic distributor does not work well. – Check and repair
- Desiccant filter for double windscreen under the cabin has to be changed
- Waste gate on the turbocharger is bad or lost. Please repair.
- The hydraulic level gage has to be replaced (part 217-3557)