

CITROËN
RACING

3MO
Performance

DS3
R3

C23 – C29

3MO controlled gearbox

Procedures – Features – Running

2011 prices for services & authorized spare parts

AFTER SALE – SERVICE – SPARE PARTS:

contact@3mo.com

Tel. +33(0)2 43 53 29 39

Fax. +33(0)2 43 56 60 20

TECHNICAL SUPPORT

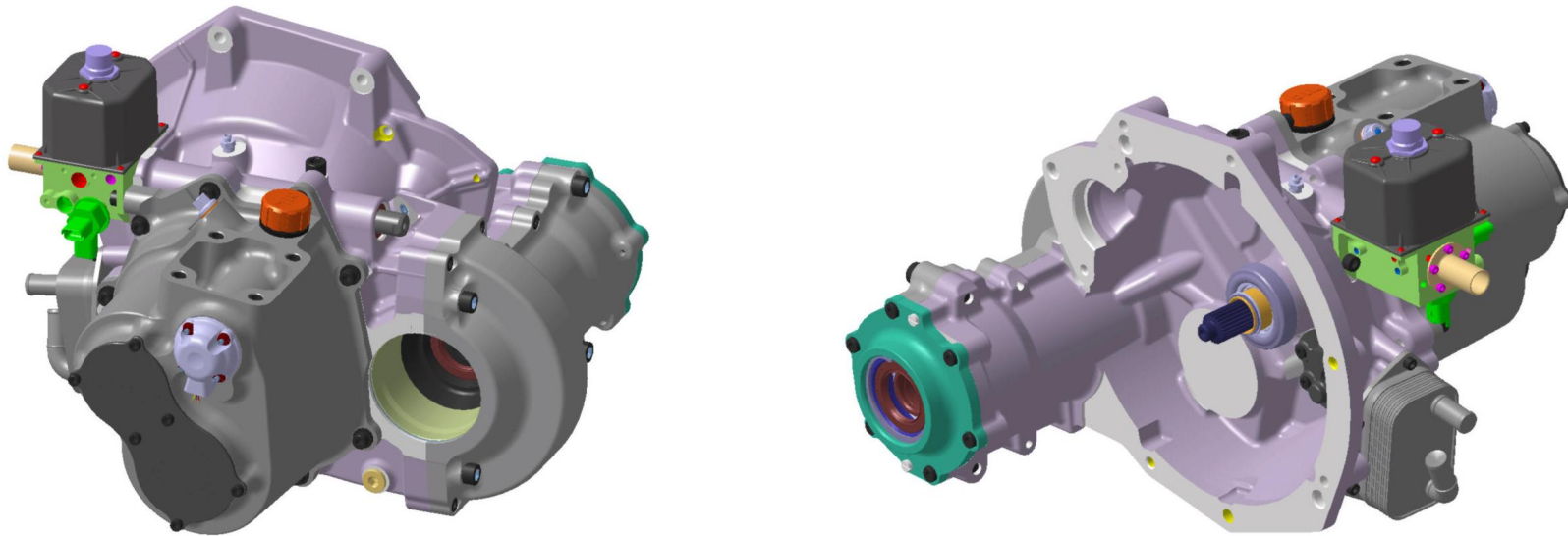
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DS3 R3 is fit with a hydraulic controlled gearbox. This is the final result of the friendly co-design between the Citroën Racing and 3MO Performance staffs, during the validation test sessions of DS3-R3.

This document is summarizing the main features and the assembly and running recommendations.



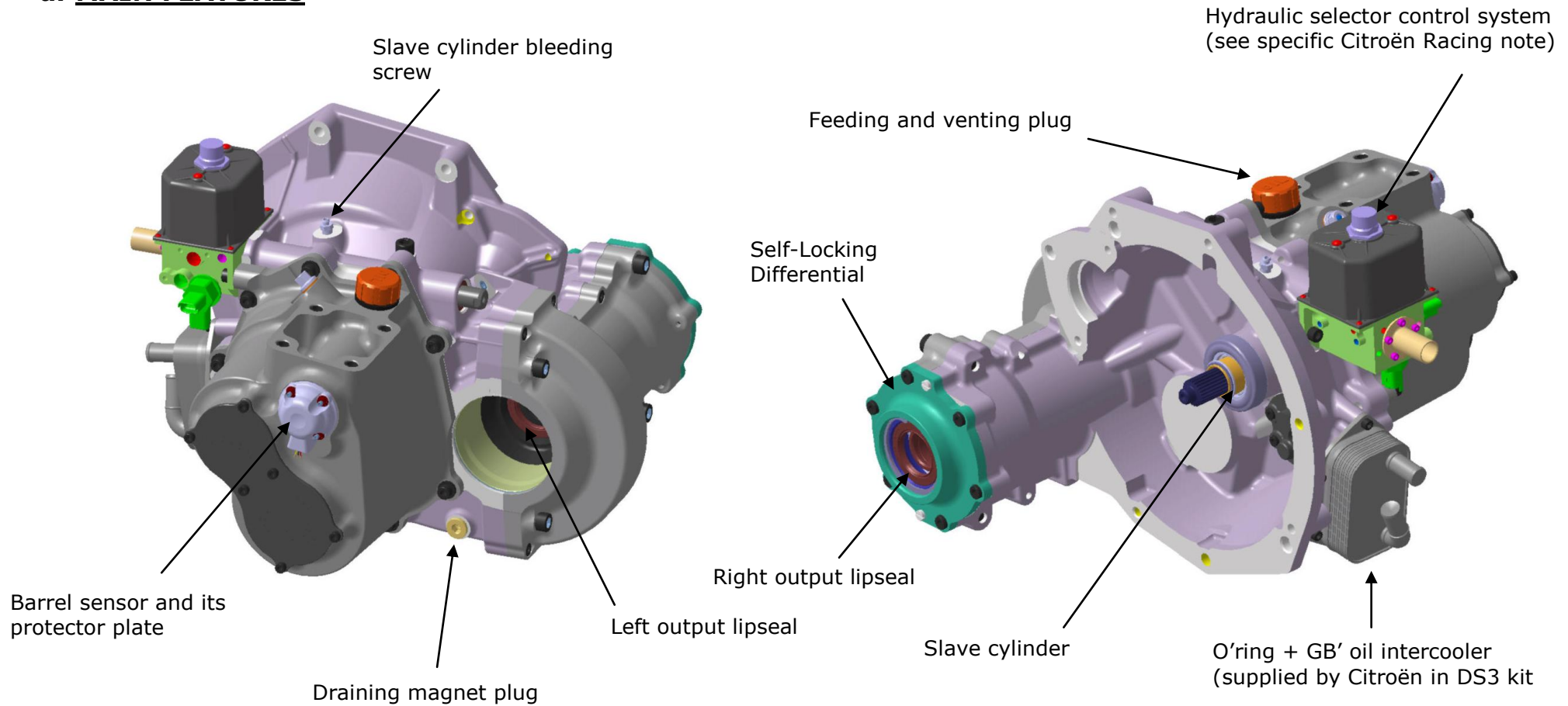
More over, the after sale procedures for spare parts and services are presented, as the spare pare list is.

The prices are defined.

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1- RUNNING RECOMMENDATIONS

a. MAIN FEATURES



DS3 R3 gearbox Data Sheet

- ⇒ Sequential gearboxes, 6 gears + reverse.
- ⇒ Multi plates (8 per each side) Self locking differential
- ⇒ Internal lubrication mesh and oil pump
- ⇒ Externally controlled selector. Hydraulic selector unit flanged on the front GB'x mating face.

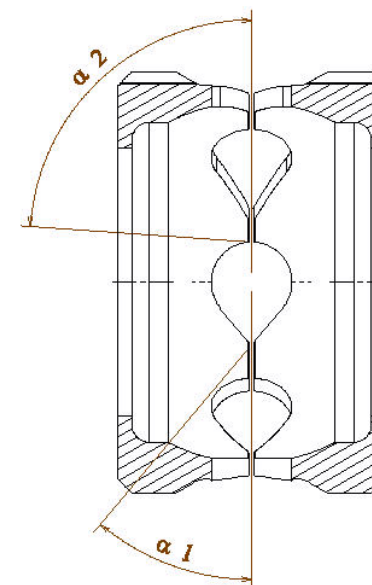
Homologated ratio chart

| Ratios | Z1 | Z2 |
|---------------------|-----------|-----------|
| 1 ^{ère} | 12 | 35 |
| 2 ^{ème} | 15 | 32 |
| 3 ^{ème} | 17 | 29 |
| 4 ^{ème} | 17 | 25 |
| 5 ^{ème} | 19 | 25 |
| 6 ^{ème} | 19 | 23 |
| Final Drive | Z1 | Z2 |
| Court | 16 | 53 |
| Inter | 17 | 53 |
| Long | 16 | 47 |
| Reverse gear | | |
| | 14 | 26 |
| | | 44 |

Homologated differential



Homologated Diff's ramps

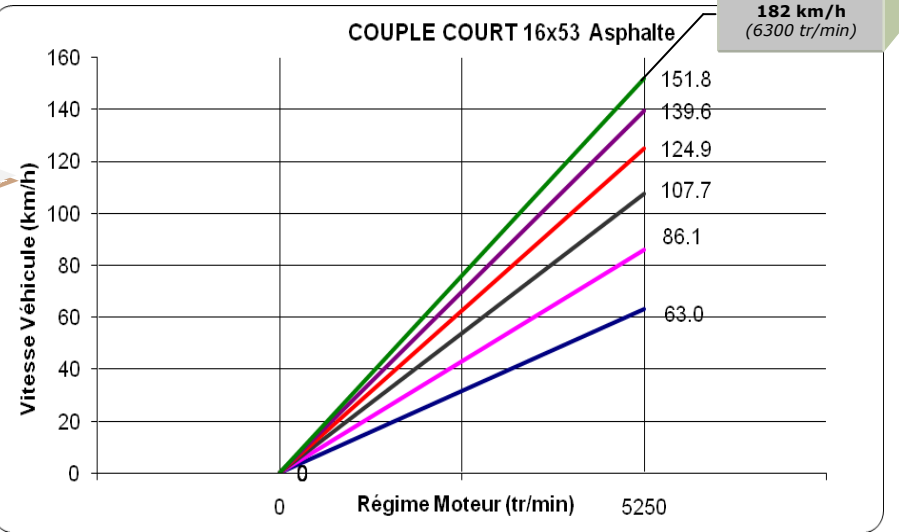
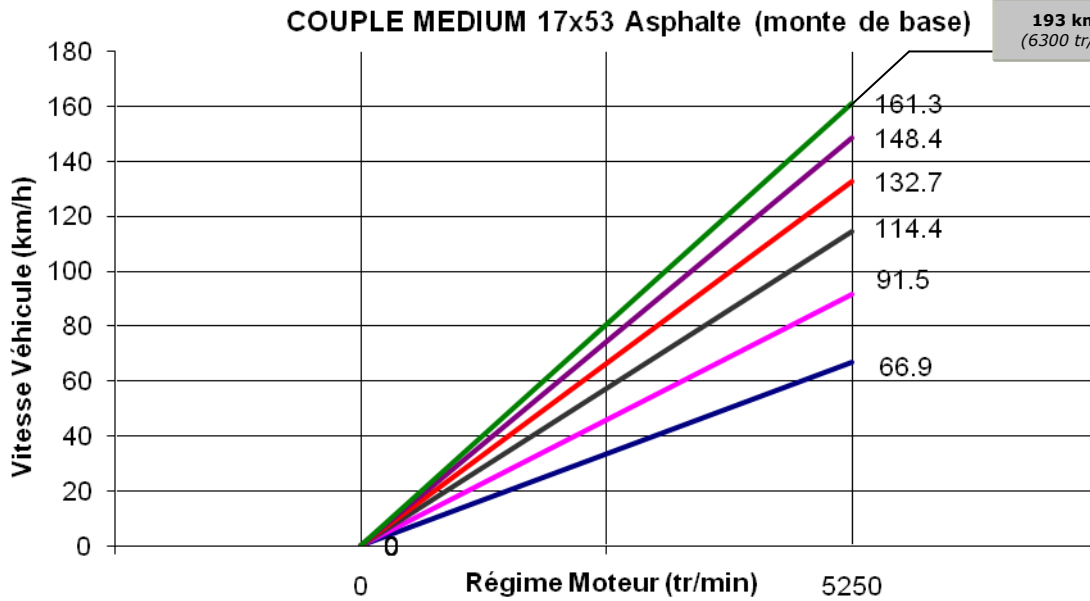


| Rampes du différentiel | |
|------------------------|------------|
| $\alpha 1$ | $\alpha 2$ |
| 30° | 75° |
| 35° | 60° |
| 40° | 60° |
| 45° | 60° |
| 45° | 90° |

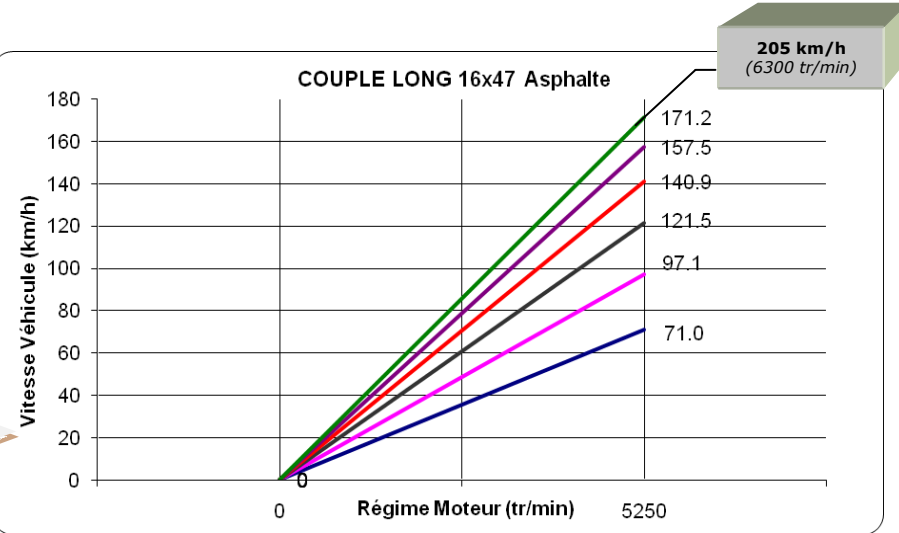
Preload is free (see set-up sheet)

RATIO CHART :

Short final drive option 16x53



long final drive option 16x47



b. RUNNING RECOMMENDATIONS

The running recommendations are notified to maintain the product in the best conditions, using simple technical rules to drive your hydraulic controlled equipment:

- ⇒ Respect the checking and diagnosis which are proposed on the several documentations of the car
- ⇒ Oftenly double-check the system capacity thanks to the data logger.
If in doubt : ASK directly to your Citroen Racing technical contact.
- ⇒ Respect the maintenance schedule
- ⇒ Respect the services procedures.



A too long fault mode of one hydraulic system parameter (*like wire connection, sensor failure, power less, stuffy oil filter...etc.*) may damage the mechanical internal parts of the 3MO gearbox..

The frequent monitoring of the hydraulic selector system is imperative.

3MO will not be responsible in case of damage successive to a fault mode use.

MAINTENANCE SCHEDULE:

Gearbox and hydraulic selector unit service (3MO workshop) : every 1000 km (SS + tests)

- ✓ Testbench session for datalogger monitoring file recording
- ✓ Last race run datalogger file analysis
- ✓ Disassembly – Diagnosis - quote
- ✓ Sealing and fixture components replacement for gearbox (GB'x service parts kit)
- ✓ Sealing and fixture components replacement for hydraulic unit
- ✓ Indexing balls and used parts replacement after customer acceptance
- ✓ Assembly
- ✓ Testbench session for validation and datalogger file recording..

Main parts lifetime :

| Part | Area | Lifetime (km SS + tests) |
|---|-----------|-----------------------------|
| Input (clutch) shaft | GB'x | 2000 km |
| Final Drive (after non-destructive analysis result) | GB'x | 2000 km |
| Complete selector shaft | GB'x | 1000 km |
| Indexing balls | GB'x | 1000 km |
| Bearings | GB'x | 2000 km |
| Slave cylinder | GB'x | 2000 km |
| Oil filter cartridge | GB'x | 400 km (2 oil drains) |
| Hydraulic unit revision parts | Hydr.Unit | 1000 km |

OIL DRAIN = every 200 km SS + tests

OIL: TOTAL H501068

1L4 (including intercooler)

**HYDRAULIC CYLINDER AXLE TIGHTENING
PROCEDURE = each service during rally**

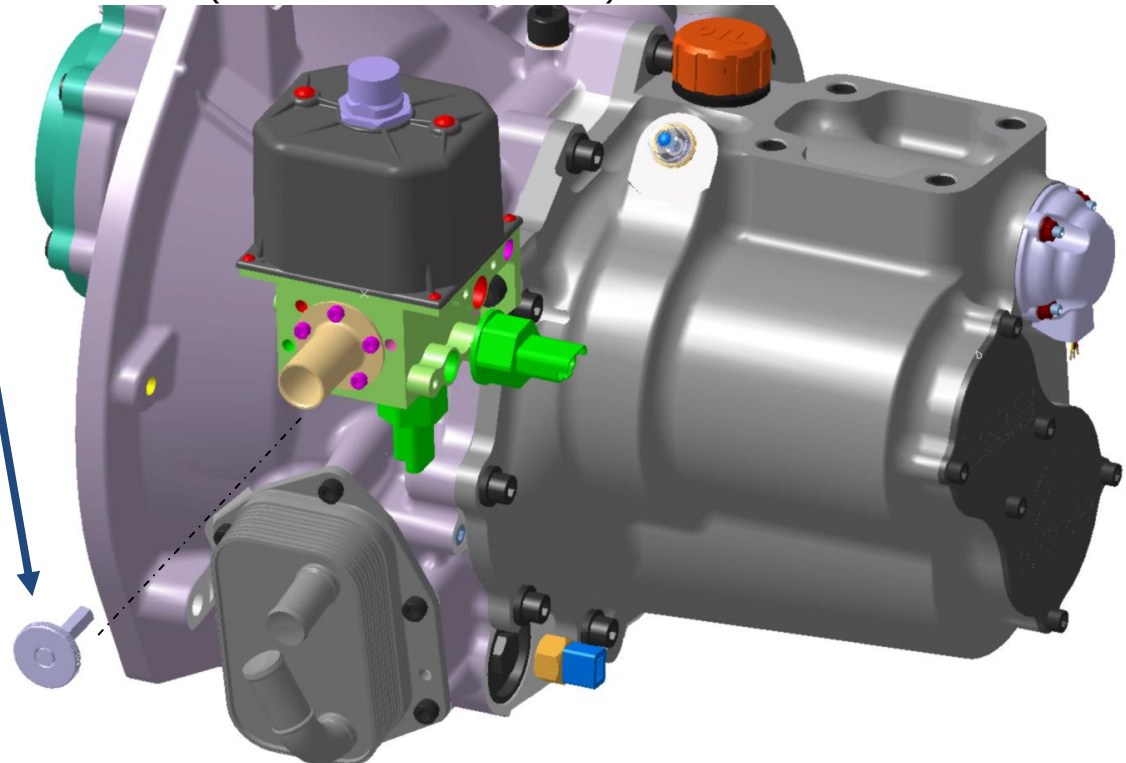


c. HYDRAULIC CYLINDER AXLE TIGHTENING PROCEDURE

The hydraulic selector unit is flanged directly to the gearbox selector axle by a screwed assembly.

The tightening procedure must be done during **EACH SERVICE PARK**, as the tire pressure control or the wheel tightening !

- Remove the plastic plug closing on the output tube
- Engage the special tightening tool **D000025A** (see at the end of the catalog)
- Screw the unit axle (clockwise) until the mechanical end. (PLEASE DO NOT FORCE)
- Unscrew for **45° (=1/8° turn)**
- Install back the plastic plug



d. SLAVE CYLINDER REPLACEMENT PROCEDURE

Valid only after have removed the gearbox from the engine, in case of external leakage.

PLEASE DON'T TRY TO DISASSEMBLE THE ENTIRE GEARBOX: IT'S NT NECESSARY !

Leg 1 : remove the complete slave cylinder pulling thanks to the RELEASE BEARING

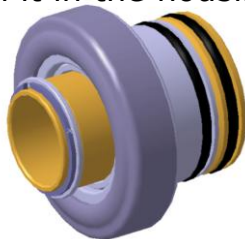
Leg 2 : clean the cylinder location with 90° alcohol.

Leg 3 : check that there's no sharp edges in the diameter (in case of sharp edge : gearbox service at 3MO workshop)

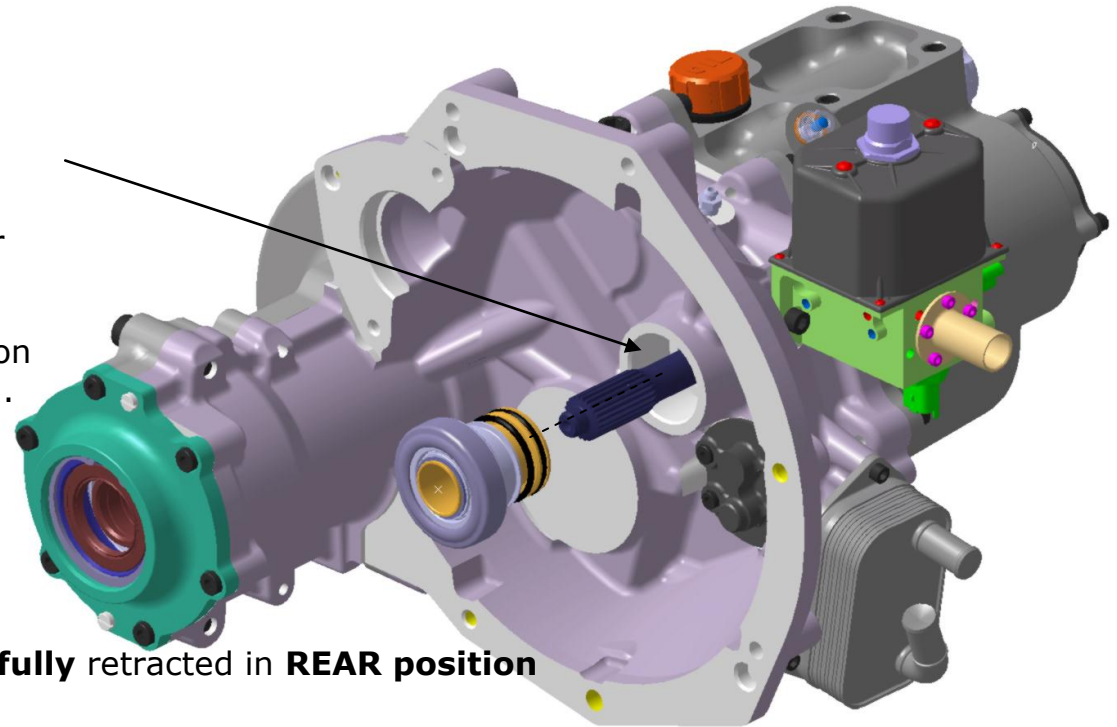
Leg 4 : The brand new slave cylinder is sold with grease on. Check that the inner/outer diameters are greased. If in doubt, fit generously silicon grease On the inner/outer O'rings.

Leg 5 : install the complete new slave cylinder **9220BUTEEDS3R3V01**

- Install it in the housing checking the piston **is fully** retracted in **REAR position**



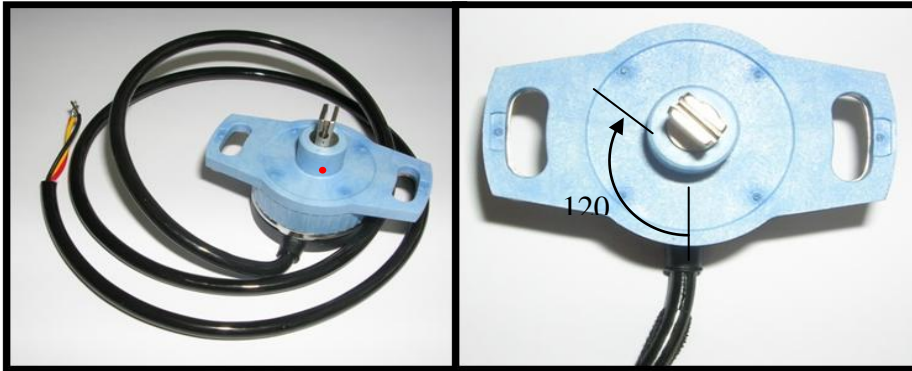
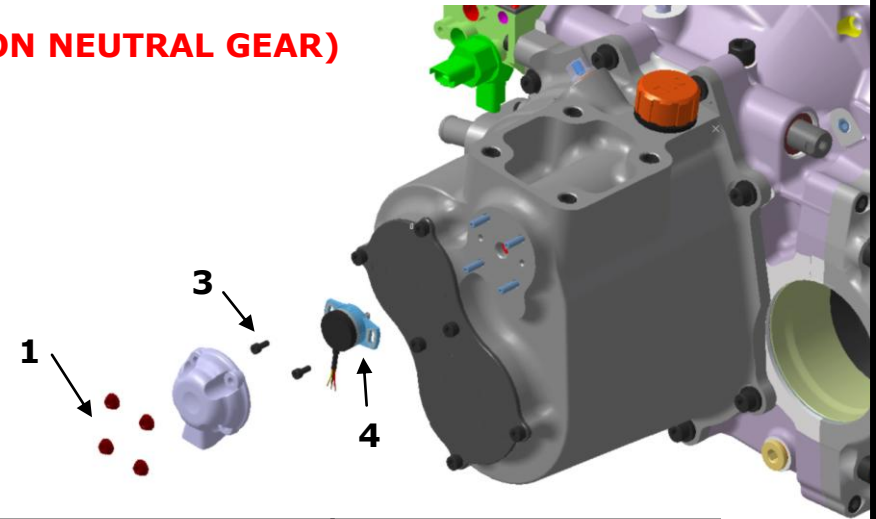
- When you pass the O-ring: push roughly, taking care to not cut the O-ring.





e. BARREL SENSOR REPLACEMENT PROCEDURE (DO IT ON NEUTRAL GEAR)

- Leg 1 :** Remove the 4 M5 nuts
- Leg 2 :** Remove the plastic protector (réf **P9002036A**)
- leg 3 :** Remove the 2 M4x10 CHC bolts, fixing the barrel sensor
- Leg 4 :** Remove the wired barrel sensor (réf **X-ASSY903895258B**)
- Leg 5 :** Tune the sensor thanks to following instructions :

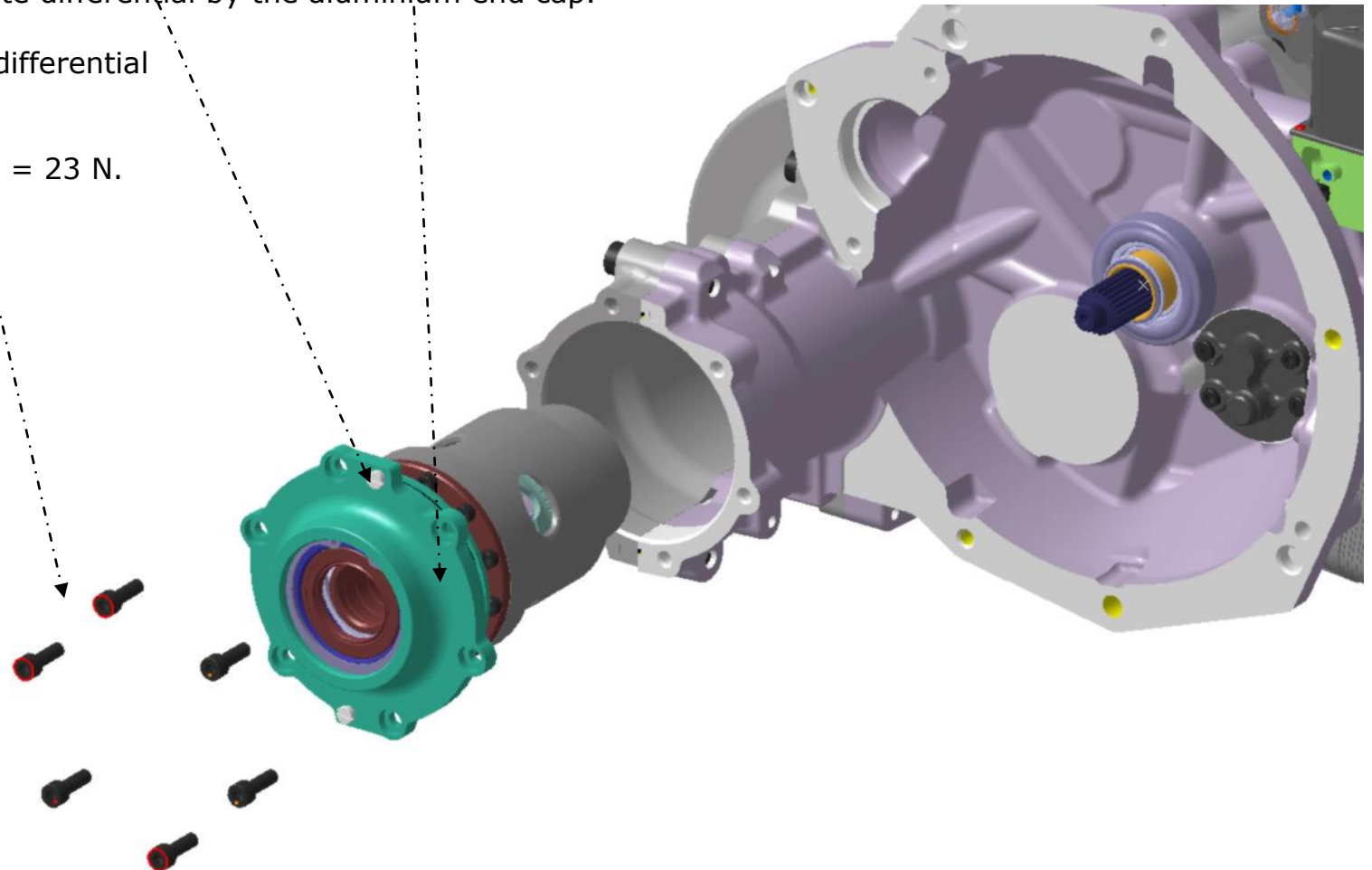


- 1- On the new sensor, please align the red marker on the shaft to the wire output. (see Picture 1)
- 2- Looking face to the sensor (picture 2), turn clockwise from around 120°.
- 3- All the gearboxes are install to neutral in our workshop before shipment. On picture 3, the sensor axle connection is oriented as in neutral position.

- Leg 6 :** Install the new sensor with the wire in bottom direction. Smoothly screw the 2 M4x10 CHC bolts. Check the voltage on the Dashboard (mechanics pages): NeutralVoltage 1000 mV +/- 20mV
- Leg 7 :** Screw the M4x10 CHC bolts, including 243 loctite glue, put-on the plastic protector then the 4 M5 nuts

f. COMPLETE DIFFERENTIAL ASSEMBLY REMOVAL PROCEDURE

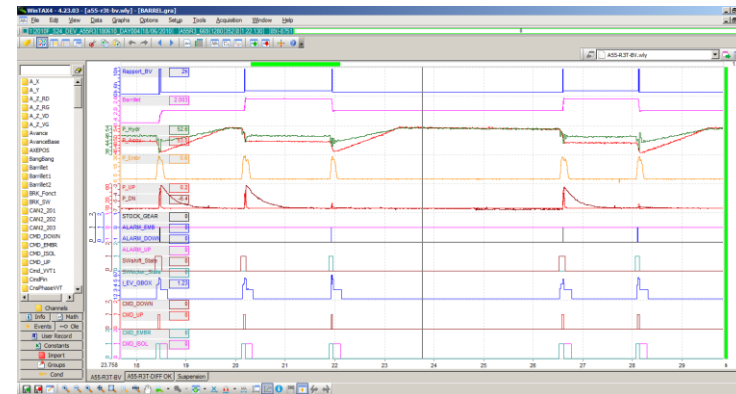
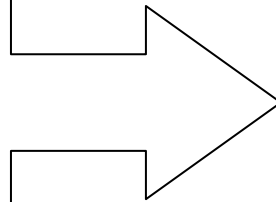
- Leg 1 :** Remove the 6 fixing bolts of the differential end cap
- Leg 2 :** place 2 bolts in the free threaded holes and screw to spread the end cap from the main housing
finally, pull the complete differential by the aluminum end cap.
- Leg 3 :** Replace or service the differential
- Leg 4 :** Invert the procedure.
Bolts Tightening torque = 23 N.
Glue Loctite 243.



2- AFTER SALE:

The hydraulic selector control system of the DS3-R3 gearbox requires, after each service, a test bench session. The aim is to validate the default absence of a complex assembly (mechanic, hydraulic, electric and electronic !).

Thought each gearbox which is assembled or serviced by the 3MO workshop staff is test on the bench, with the same system as on your DS3-R3. A datalogger file is recorded, and stocked after each bench running.



Software : Magneti Marelli Wintax®

In order to offer a direct service to the DS3-R3 owners, Citroen Racing had selected 3MO to fully manage the after-sale aspects of its own products, in the following conditions:

- Exclusive service for gearbox, differential and hydraulic selector unit in the 3MO workshop, to let each customer having a complete diagnosis.
- Spare parts selling by 3MO (only the list which is presented in this brochure).
-
- Direct commercial relationship between owners and 3MO (request, quotes, orders, invoices, payments)

a. GEARBOXE SERVICE PROCEDURE :

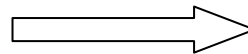
please take care of a 2 weeks schedule

- 1- Please send the 'Gearbox Service Request Form' → fax +33 (2) 43 56 60 20 + email (scan) at contact@3mo.com
- 2- 3MO send you back an acknowledgement, describing the delivery time
- 3- Shipment of the **gearbox (with diff)+ hydraulic selector unit** to 3MO (Please join the last datalogger file on a USB drive)

SAS 3MO Performance

Laboratoire BV
36 rue de Bruxelles
ZA Les Bozées
53 000 LAVAL (France)

- 4- Preliminary disassembly – Diagnosis
- 5- Quote transfer from 3MO (service and shipment costs) by fax + email
- 6- Quote acceptance sending back by fax + email (scan) contact@3mo.com :
 - Signed quote (+ stamp for companies)
 - Bank swift print screen for services pre-payment



Service start

NB. In case of extra-costs the initial diagnosis didn't take care, a quote amendment will be send for acceptance (sign + stamp + bank swift print screen)

NB. You're free to refuse to do some works. In case of, you just have to strike the lines on the quote ! If you're choice is not compatible with normal running disposition, you will be informed.

- 7- 3MO send back the gearbox + hydraulic selector unit. The final invoice will be joined with the package.

NB. The entire payment is prior to the departure of the materials from our workshop.

b. ONLY-DIFFERENTIAL SERVICE PROCEDURE:

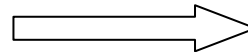
please take care of a week schedule

- 1- Please send the 'Only Differential Service Request Form' → fax +33 (2) 43 56 60 20 + email (scan) at contact@3mo.com
- 2- 3MO send you back an acknowledgement, describing the delivery time
- 3- Shipment of the **complete differential (see removal procedure)** to 3MO

SAS 3MO Performance

Laboratoire BV
36 rue de Bruxelles
ZA Les Bozées
53 000 LAVAL (France)

- 4- Preliminary disassembly – Diagnosis.
- 5- Quote transfer from 3MO (service and shipment costs) by fax + email
- 6- Quote acceptance sending back by fax + email (scan) contact@3mo.com :
 - Signed quote (+ stamp for companies)
 - Bank swift print screen for services pre-payment



Service start

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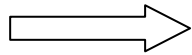
- 7- 3MO send back the gearbox + hydraulic selector unit. The final invoice will be joined with the package.

NB. The entire payment is prior to the departure of the materials from our workshop.

c. SPARE PARTS ORDER PROCEDURE:

The available parts are externals: the replacement doesn't need the full gearbox or hydraulic selector unit dismounting. Some specific tools are also available.

1- Send the 'Spare Parts Order form' fully fit → fax +33 (2) 43 56 60 20 + email (scan) at contact@3mo.com



Joint the bank swift print screen as mentioned on the form.

2- 3MO send you back an acknowledgement, describing the availability and delivery time

3- Parts shipment.

NB. *The entire payment is prior to the departure of the materials from our workshop.*

d. DELIVERIES SERVICES PROCEDURE

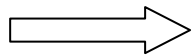
The deliveries services which are not material services or spare parts selling are listed in the following e) chapter.

The request answer for a delivery service (like test-session assistance) depends mainly of the availability of our technicians and their equipment.

Depending of our schedule, a positive issue is not fully sure.

1- Send the 'Deliveries Service Request Form'

→ Fax +33 (2) 43 56 60 20 + email (scan) at contact@3mo.com



3MO send you back a specific quote detailing the staff availability, and the global costs.

2- Quote acceptance sending back by fax + email (scan) contact@3mo.com

- Signed quote (+ stamp for companies)
- Bank swift print screen for services pre-payment

3- Definition of hours, logistic and details between both technical staffs.

NB. The entire payment is prior to 3MO staff travelling

e. LIST OF SERVICES OFFERED BY 3MO

- Gearbox service (including differential)
- Only-Differential service
- Spare parts selling
- Deliveries service :
Differential testing (minimum 2 test days + travel)
A 3MO technician is coming to your test session with all the homologated differential and final drive parts. So you can test and define your set-up without direct investment. At the end of the test-session, if you want, the defined set-up (diff + final drive) can be install into your DS3 gearbox !



3- SERVICE ANS SPARE PARTS PRICES

a. PARTS

| REP | PART NUMBER | PU € HT | DESIGNATION |
|-----|--------------------|----------|-----------------------------------|
| 1 | CE9002002A | 105,70€ | Clutch locating |
| 2 | D0000025A | 47,50€ | Hydraulic unit axle tighten tool |
| 4 | X-ASSY903895258B | 232,86€ | Barrel sensor (without protector) |
| 5 | P9002036A | 9,52€ | Barrel sensor Protector |
| 6 | 514600003 | 14,85€ | Output Lip seal FR/FL |
| 7 | X-1C2963835B | 1630,79€ | Complete Hydraulic selector unit |
| 8 | 514100010 | 1,60€ | Clutch internal pipe O-ring |
| 9 | 515000003 | 11,36€ | Feeding and Venting Plug |
| 10 | 512900001 | 4,88€ | Clutch Bleeding screw |
| 11 | 9220BOUCHAIMANT01 | 7,40€ | Magnet Drain Plug + spacer |
| 12 | 9220FILTRET89V01 | 43,71€ | Kit oil filter |
| 13 | 9220BUTEEDS3R3V01 | 222,84€ | Complete slave cylinder |
| 14 | 9220DIFFDS33075V01 | 2992,81€ | Complete Differential 30°/75° |
| 15 | 9220DIFFDS33560V01 | 2992,81€ | Complete Differential 35°/60° |
| 16 | 9220DIFFDS34060V01 | 2992,81€ | Complete Differential 40°/60° |
| 17 | 9220DIFFDS34560V01 | 2992,81€ | Complete Differential 45°/60° |
| 18 | 9220DIFFDS34590V01 | 2992,81€ | (standard mounting) |
| 19 | BCSP9979A3 | 14,20€ | Complete Differential 45°/90° |

b. SERVICES

| REP | PART NUMBER | PU € HT | DESIGNATION |
|-----|--------------------|----------|---|
| 1 | REVISIONBV-ASS-CSP | 1061,43€ | Gearbox service package+ testbench session (including only fixing + sealing kits + oil filter cartridge) |
| 2 | REVISION_BLOC_HYD | 624,51€ | Hydraulic Selector Unit package + testbench session (including sealing kit + solenoid valves) |
| 3 | REVISIONDIFF-A55R3 | 483,88€ | Only-Differential service package (including fixing + sealing kits + side bevel gear bearings) |
| 4 | TESTSDIFFDS3R301 | 980€ | Differential and Final Drive Test Day. (including supplying of 5 complete differential + 3 final drives) Travelling cost + catering + accommodation: as extra costs on the quote. |

FINAL DRIVE OPTION:

1364,50 € for 16x53, 17x53 (standard) or 16x47 final drive
Assembly in 3MO workshop or during test session delivery service

SERVICE REQUEST FORM

GEARBOX SERVICE *(including differential)* + HYDRAULIC SELECTOR UNIT SERVICE

| | | | |
|--|--|--|-----------------|
| NAME - First name or Company name | | Delivery date in 3MO workshop | |
| Adress | | Requested return date | |
| Email | | SELF LOCKING DIFFERENTIAL | |
| Fax | | Ramp angle actual | / |
| N° DS3-R3 Gearbox | | Final drive <i>(16x53 / 17x53 / 16x47)</i> | Preload actual |
| N° Differential | | Actual | / |
| Km SS + test Total Gearbox | | Request | Preload request |
| Km SS + test Total Differential | | Date + Sign (+ stamp for companies) | |
| Special notes about your kit | | | |

SERVICE REQUEST FORM

ONLY DIFFERENTIAL SERVICE

| | | | | |
|--|--|--|--|---|
| NAME - First name or Company name | | | Delivery date in 3MO workshop | |
| Adress | | | Requested return date | |
| Email | | | SELF LOCKING DIFFERENTIAL | |
| Fax | | | Ramp angle actual | / |
| N° de Différential | | | Preload actual | |
| Km SS + test Total Differential | | | Ramp angle request | / |
| Special notes about your kit | | Date + Sign (+ stamp for companies) | | |

SERVICE REQUEST FORM

DELIVERIES SERVICE: DIFFERENTIAL AND/OR FINAL DRIVE TEST SESSION ATTENDANCE

| | | | |
|--|--|--|--|
| NAME - First name or Company name | | DATES OF THE TEST SESSION | |
| Adress | | Place - Country | |
| Email | | Accommodation for our staff by yourself (yes/no) | |
| Fax | | Catering for our staff by yourself (yes/no) | |
| N° DS3-R3 Gearbox | | Différential tests (yes/no) | |
| N° Différential | | Final drives tests (yes/no) | |
| Special notes about your kit | | Date + Sign (+ stamp for companies) | |

TO SEND BY FAX +33 (0)2 43 56 60 20 AND SCANMAIL contact@3mo.com
 THE BANK SWIFT COPY (PRINT SCREEN) MUST BE JOINED



Purchase order for parts

DATE

| DESIGNATION | PART NUMBER | Price € ex vat /off | Qty | Total € ex VAT |
|--|--------------------|---------------------------|-----|-------------------|
| Clutch locating shaft | CE9002002A | 105,70€ | | |
| Hydraulic Selector axle tightening tool | D0000025A | 47,50€ | | |
| Wired barrel sensor (without protector) | X-ASSY903895258B | 232,86€ | | |
| Barrel sensor protector | P9002036A | 9,52€ | | |
| Output Lip Seal FR or FL | 514600003 | 14,85€ | | |
| Complete Hydraulic Selector Unit | X-1C2963835B | 1630,79€ | | |
| Internal clutch pipe O-ring | 514100010 | 1,60€ | | |
| (between hydraulic unit and gearbox) | 515000003 | 11,36€ | | |
| Feeding and Venting Plug | 512900001 | 4,88€ | | |
| Clutch bleeding screw | 9220BOUCHAIMANT01 | 7,40€ | | |
| Magnet drain plug + copper spacer | 9220BUTEEDS3R3V01 | 222,84€ | | |
| Kit oil filter | 9220FILTRETIV89V01 | 43,71€ | | |
| Complete slave cylinder | BCSP9979A3 | 14,20€ | | |
| 1L hydraulic fluid LDS drum | 9220DIFFDS33075V01 | 2992,81€ | | |
| Complete differential 30°/75° | 9220DIFFDS33560V01 | 2992,81€ | | |
| Complete differential 35°/60° | 9220DIFFDS34060V01 | 2992,81€ | | |
| Complete differential 40°/60° | 9220DIFFDS34560V01 | 2992,81€ | | |
| Complete differential 45°/60° (standard) | 9220DIFFDS34590V01 | 2992,81€ | | |

Invoice address + Stamp + sign

Delivery address (if different)

PARTS ORDER AMOUNT (€ ex VAT) A

CARRIAGE COST (standard)
FRANCE (12€ + 2% of total order amount)
CEE (24€ + 2% of total order amount)
Ex CEE = delivery Ex-Works only (no DDU/DDP Incoterms management) **B**

EXPRESS OPTION
 YES NO

VAT
FRANCE PPRIVATY or COMPANY : VAT = 0.196*(A+B)
CEE COMPANY : VAT=0€ **CEE PRIVATY** : VAT = 0.196*(A+B)
Ex CEE :VAT=0€ **C**

TOTAL AMOUNT = A+B+C standard shipment) **OR A+2B+C** (port express)

Restricted grid for 3MO sales management staff

REQUESTED DELIVERY TIME

PAYMENT BY BANK SWIFT TRANSFER

Please join the copy of the bank swift

| Bank | Counter | Account | Key RIB |
|-------|---------|-------------|---------|
| 15489 | 00381 | 00062634101 | 37 |

IBAN

FR76 1548 9003 8100 0626 3410 137
 (International Bank Account Number)

Account bank adress
BIC = CMCIFR2A
 CFCMMABN LAVAL CME MAYENNE
 43 BD VOLNEY
 53083 LAVAL CEDEX 9
 +33(0)2 43 66 24 84

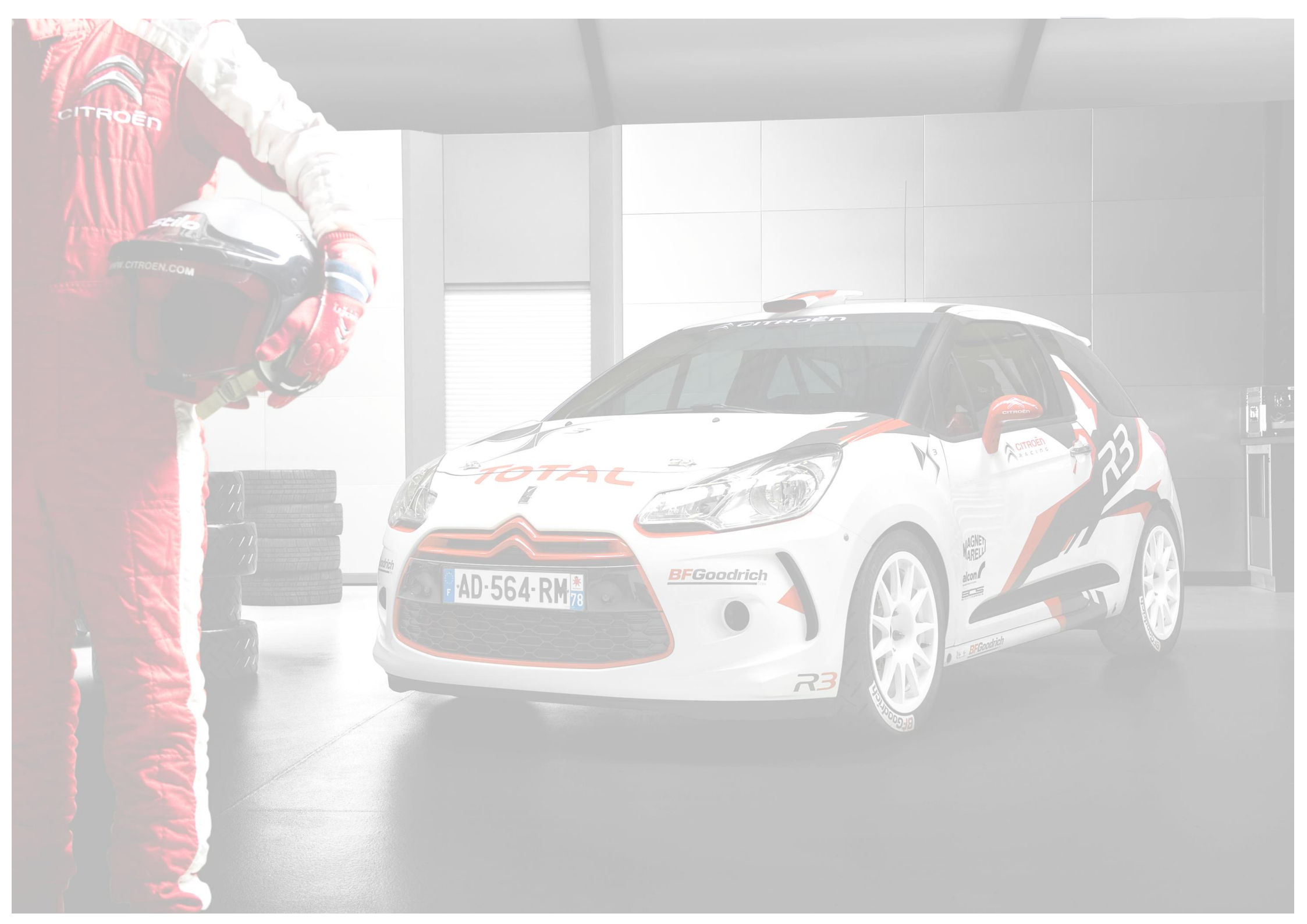
Account owner
 SAS 3MO PERFORMANCE
 ZI LES BOZEES
 RUE DE BRUXELLES
 53000 LAVAL (FRANCE)

**Technical
Data's**

**DELIVERY DATE
VALIDATE / 3MO
(DEPARTURE)**
 (do not fill)

ORDER ACKNOWLEDGEMENT

| Payment information | Bank swift copy | Payment OK | Value date | Date |
|---------------------|-----------------|------------|------------|------|
| | | | | |



CITROËN

www.CITROËN.COM

TOTAL

BFGoodrich

AD-564-RM 78

CITROËN RACING

R3

MAGNETI MARELLI
alcon
ECS

R3

BFGoodrich