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# Lettre-Service
## No. 1673-67-04

Marignane, 04.02.05

To **all Pilots,**
for **all types of helicopters** fitted with a tail rotor.

# Main rotor rotating clockwise

## SUBJECT: Reminder concerning the YAW axis control for all helicopters in some flight conditions

The technical comments in this Service-Letter apply to **main rotors rotating clockwise when seen from above**. For rotors rotating anticlockwise, see Service-Letter No. 1692-67-04.

Ref.: First reminder = S.L. No. 1518-67 dated 26.04.2001

Dear Customer,

**The analysis of the causes of severe helicopter incidents or accidents leads EUROCOPTER to issue a few reminders as regards YAW axis control in some flight situations.**

### 1 - BACKGROUND:

Various events which occurred during flight near the ground and at very low speed in light wind conditions on aircraft fitted either with conventional tail rotors or with Fenestrons, took place as follows:

From hover flight at take-off at very low speed, the Pilot initiates a left turn a few meters above the ground by applying yaw pedals towards the neutral position: the aircraft starts its rotation which increases until the Pilot attempts to stop it by applying the RH yaw pedal.

In the various cases which resulted in the loss of yaw axis control, the action applied to the RH yaw pedal was not enough (amplitude/duration) to stop rotation as quickly as the Pilot wished.

As the aircraft continues its rotation, the Pilot generally suspects a (total or partial) tail rotor failure and decides either to climb to gain speed or to get closer to the ground.

In the first case, increasing the collective pitch results in increasing the main rotor torque and consequently further speeds up leftward rotation. This results in the loss of aircraft control.

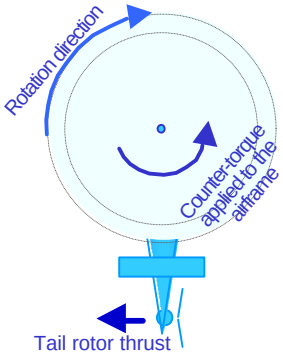
In the second case, sharp decrease in collective pitch can make the aircraft tilt to the side whilst rotating and cause it to touch the ground.

**The investigations carried out following such events have never revealed any defect as regards flight controls and tail rotor assembly.**

**Furthermore, given their altitude and weight conditions the tail rotors were far from their maximum performance limits.**

## 2 – IMPORTANT REMINDERS

AIRCRAFT SEEN FROM ABOVE

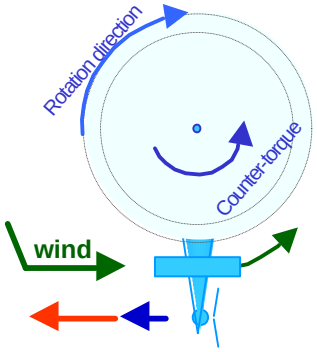



**In hover flight or in very low speed flight**:

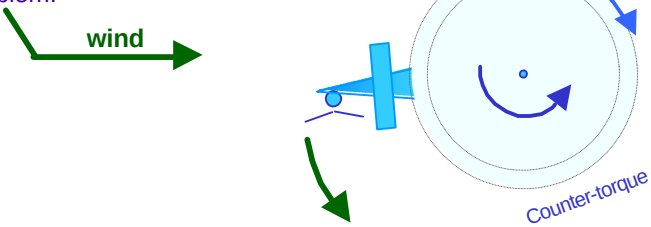
The Pilot counteracts the leftward aircraft rotation by applying RH yaw pedal.

**When adding a light unfavourable wind**,

never forget that a leftward **rotation** departure can result in the aircraft's initiating a high rotation rate, if no adequate and additional action is immediately applied to the yaw pedals.




Remember that a **tail wind** component upon departure would worsen the problem.




In a quick leftward rotation, if the Pilot attempts to counteract this rotation by applying the RH yaw pedal up to a position corresponding to that of hover flight, the aircraft will not decelerate significantly!

In this situation, **immediate action of significant amplitude** applied to the RH yaw pedal must be initiated and **maintained to stop** leftward **rotation**. **Never hesitate to go up to the RH stop**.

**Any delay when applying this correction will result in an increase in rotation speed.**

Intentional or accidental initiation of this **rotation phenomenon** can therefore be **physically explained** and is in no way connected to the tail rotor performance; **in all cases, when adequate correction is applied, rotation will stop**!

Finally, it **should also be remembered** that any intentional manoeuvre to **initiate leftward rotation** in hover flight conditions or at very low speed, must be performed through a **moderate action** on the LH yaw pedal!

## 3 – **ADDITIONAL TECHNICAL INFORMATION** relative to various tail rotor types

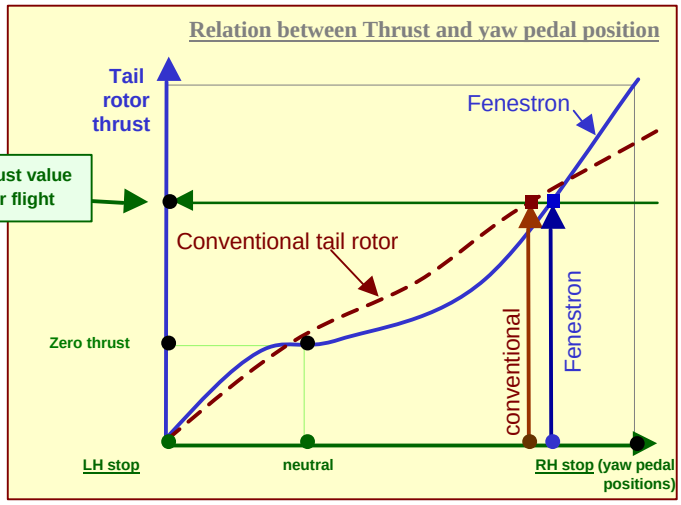
### Yaw pedal positions around the hover flight

**The « *yaw pedal position / tail rotor thrust* » law curve shape is not the same for a « conventional » rotor and a « Fenestron ».**

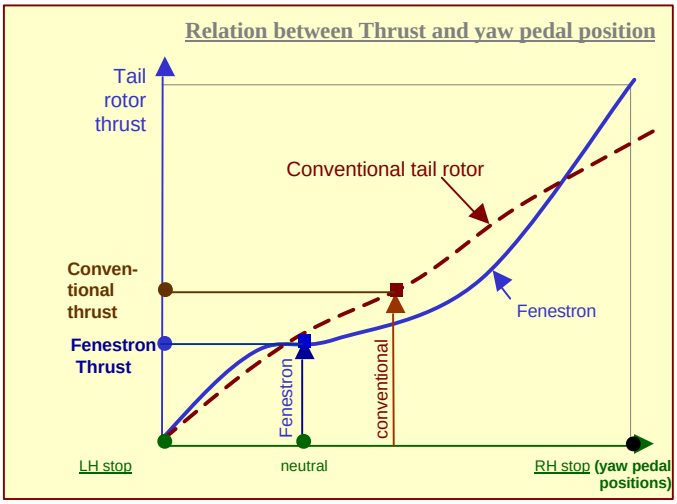
Consequently:

**For the same thrust value** needed for **hover flight**, the Fenestron requires a little more action to be applied to the RH yaw pedal.

But in hover flight, **the same variation** of yaw pedal position will result in **more significant effect** with the **Fenestron** than with the conventional rotor.



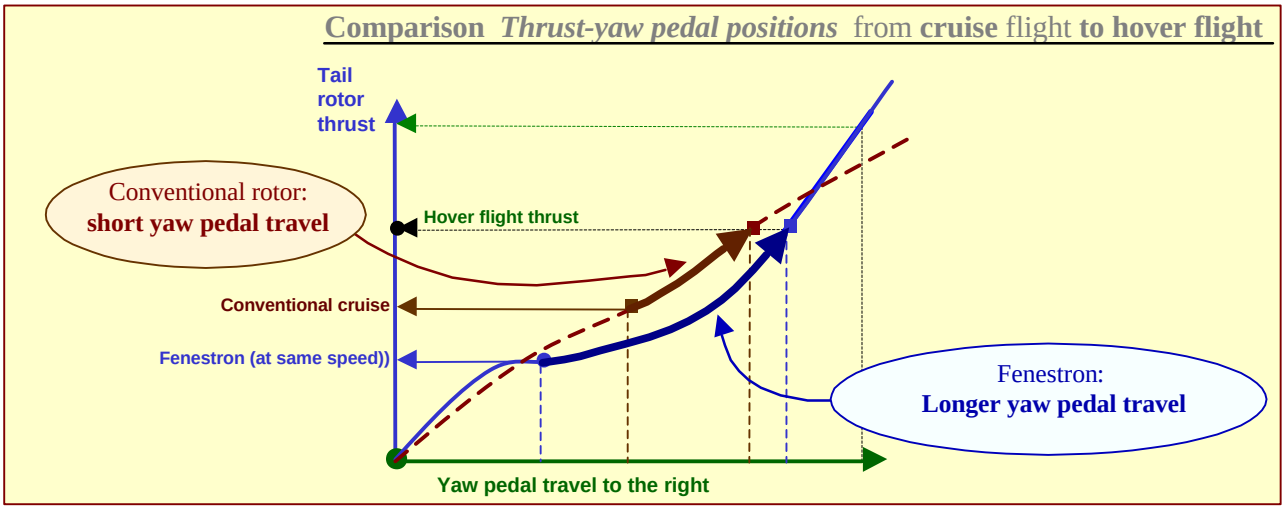

### Yaw pedal position in cruise flight




In cruise flight, the **conventional rotor** delivers a thrust which comes in addition to its vertical stabilizer profile effect, so as to maintain zero sideslip.

As regards the **Fenestron**, since the fairing effect is higher due to its large surface, the thrust to be applied by the tail rotor is lower.

### Transition from cruise flight to hover flight



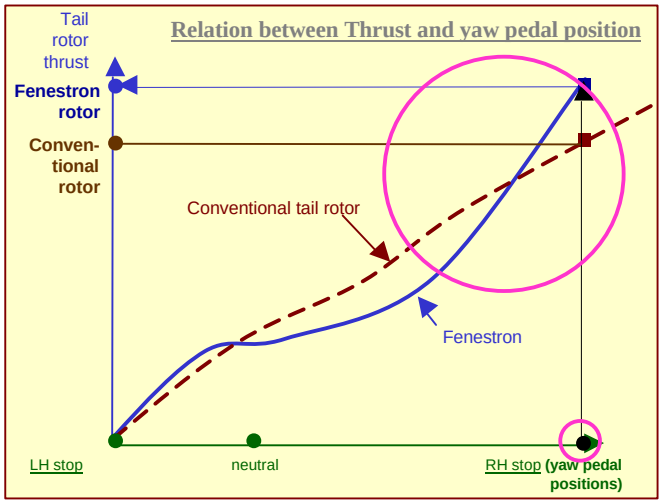

With a Fenestron, when changing from **cruise flight to hover flight**, be prepared for a **significant movement of the foot to the right**.

Insufficient application of pedal would result in a leftward rotation of the aircraft during the transition to hover.

## Using maximum thrust

To stop rotation to the left, whether it is intentional or not, never hesitate to go up to the yaw pedal RH stop!

*It can be noticed that near the RH stop, the Fenestron efficiency is very high (curve slope).*




## Conclusion

1 – In hover flight or at very low forward flight speed, stopping a quick rotation to the left must be performed by **immediately applying** the RH yaw pedal with a significant and maintained amplitude, regardless of the tail rotor type.

2 – In hover flight or at very low speed, intentional initiation of a turn to the left shall always be made by moderate action on the yaw pedals.

3 – Wind coming from the left or tail wind increases the aircraft rotation speed.

Yours sincerely,

Technical Support Operations Department

Customer Service

M. SOULHIARD