Perform the blade calibration as per the WKI

Does this solve the problem?

1] Yes

2] No

3] I don't know

- **Explanation**
  IN THE Nacelle:

  Do the blade calibration. Original calibration may be altered during component replacement, such as position sensors (Balluf), cables, proportional valves and hub computer.

  Section 5.10.9 ‘Blade Position Calibration during manual pitching in the Nacelle Mode’ of the Commissioning Manual.

Relevant documentation	
Description	**DMS No.**
Commissioning instruction V82 -1.65-Mk4	0000-9925
Blade Pitch System Test	0002-0467

Replace the defective power net

Does this solve the problem?

1] Yes

2] No

3] I don't know

- **Explanation**
  IN THE HUB:

  Check for any loose connections at the power net (Pos: G401).

  Check input and output voltage 230/115VAC /24VDC

  If defective replace the power net.

Relevant CIM case		
CIM case	**Task list**	**SWI**
1390		

Relevant spare parts	
Description	**Item No.**

PS ADC 5483R-3 10A-27,4 NM PIN	188453

Check the accumulator pre-charge pressure and recharge the accumulators

Does this solve the problem?

1] Yes

2] No

3] I don't know

- **Explanation**
  IN THE HUB:

Check all of the pitch accumulator pre-charge pressures.

If nitrogen pressure in any of the accumulators are low, recharge.

Relevant documentation	
Description	**DMS No.**
Charging of Nitrogen Accumulators	941918
Blade Accumulator Exchange	0001-2871

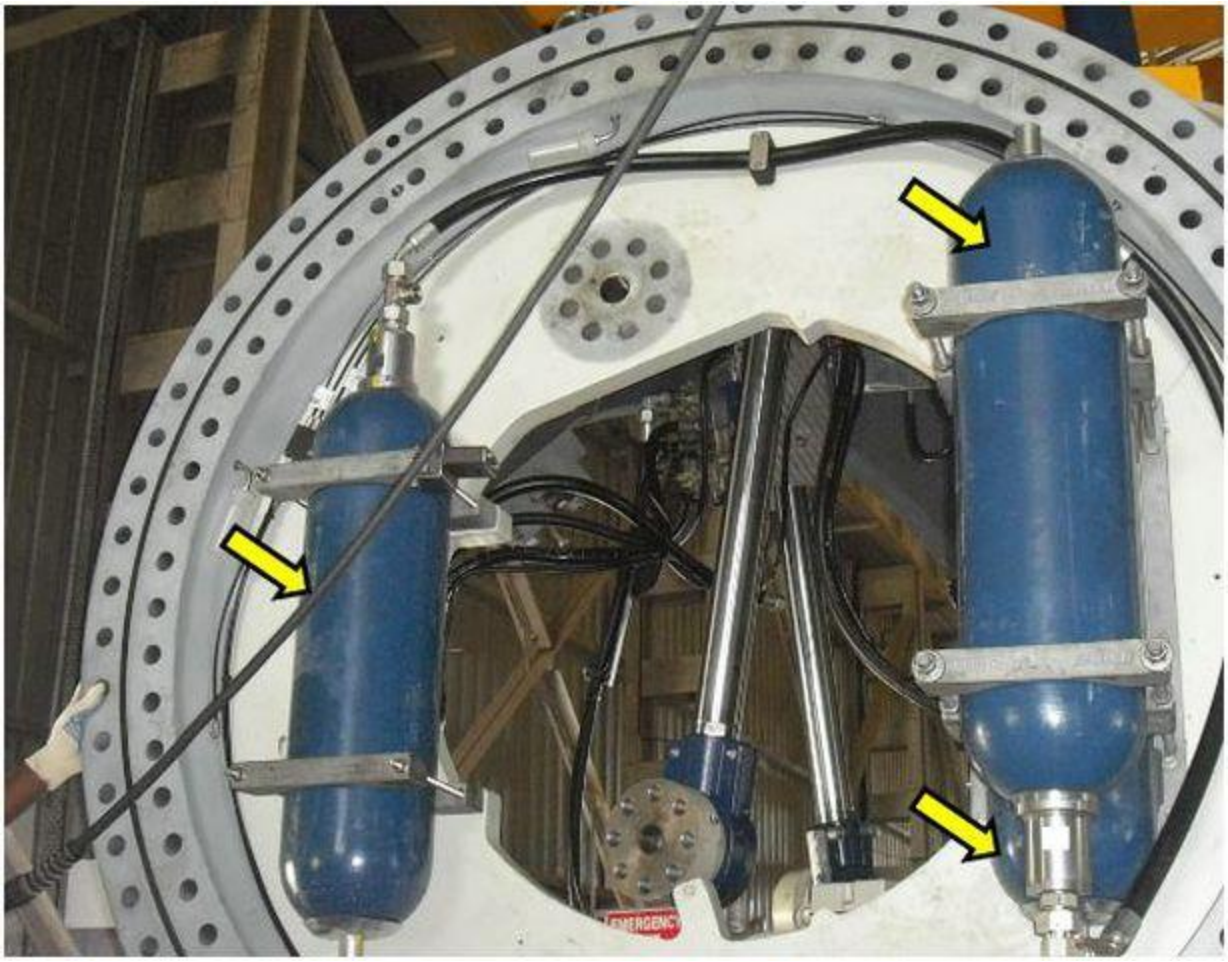
Check accumulator retrofit installation

Relevant CIM case		
CIM case	**Task list**	**SWI**

1168		0000-9402

If the bladder in the accumulator has failed, replace the accumulator.

Relevant spare parts	
Description	**Item No.**
HYDR ACCU 20 L 115 BAR DUAL (NM72)	60113096
HYDR ACCU 24.5 L 115 BAR DUAL (V82 other than Australia)	60113097
HYDR ACCU 24.5 L 115 BAR AS1210 (V82 Australia)	60113098



Replace the defective Pitch position sensor and defective cables

Does this solve the problem?

1] Yes

2] No

3] I don't know

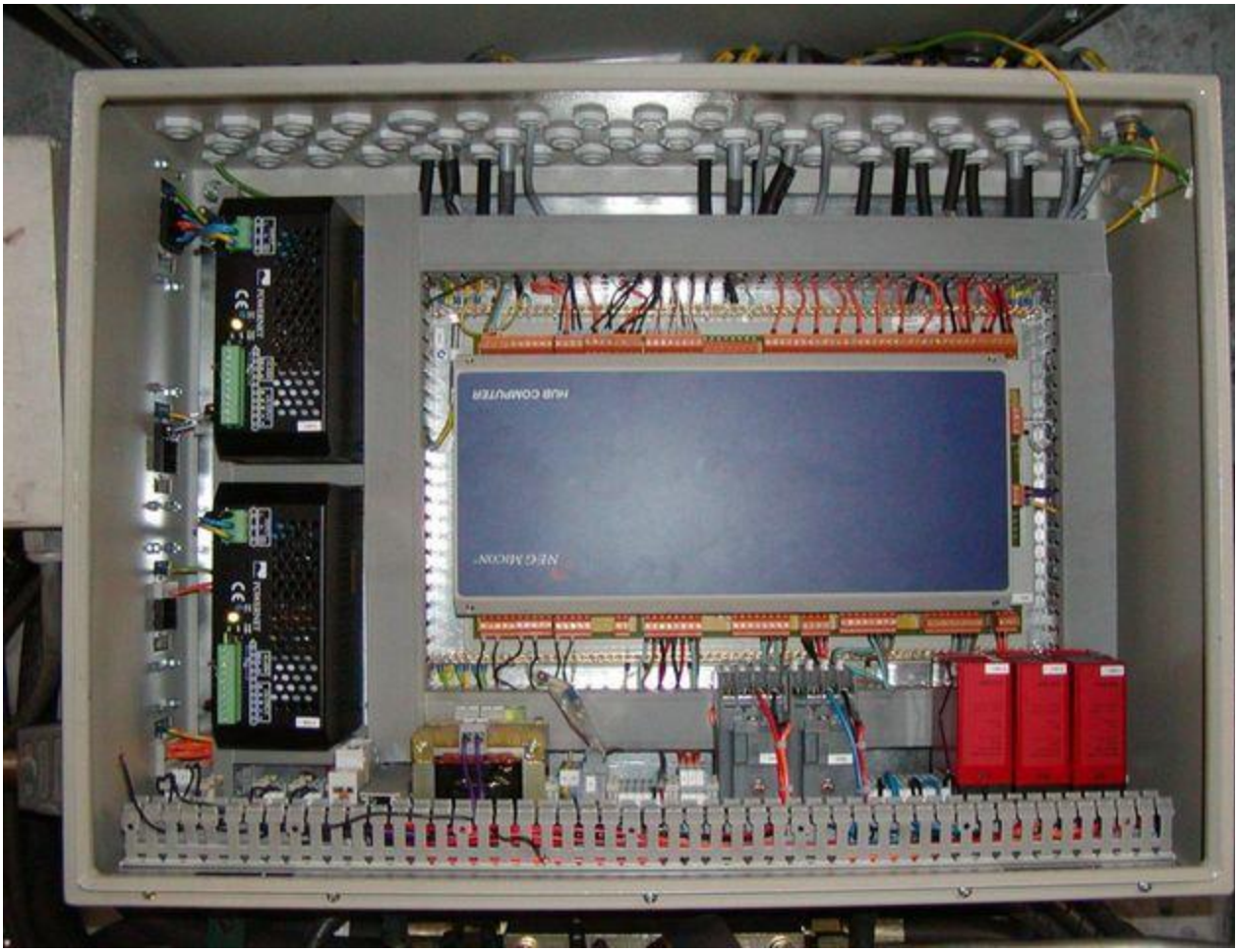
- **Explanation**
  IN THE HUB :

  Check for any loose connections in the hub computer terminal X19.

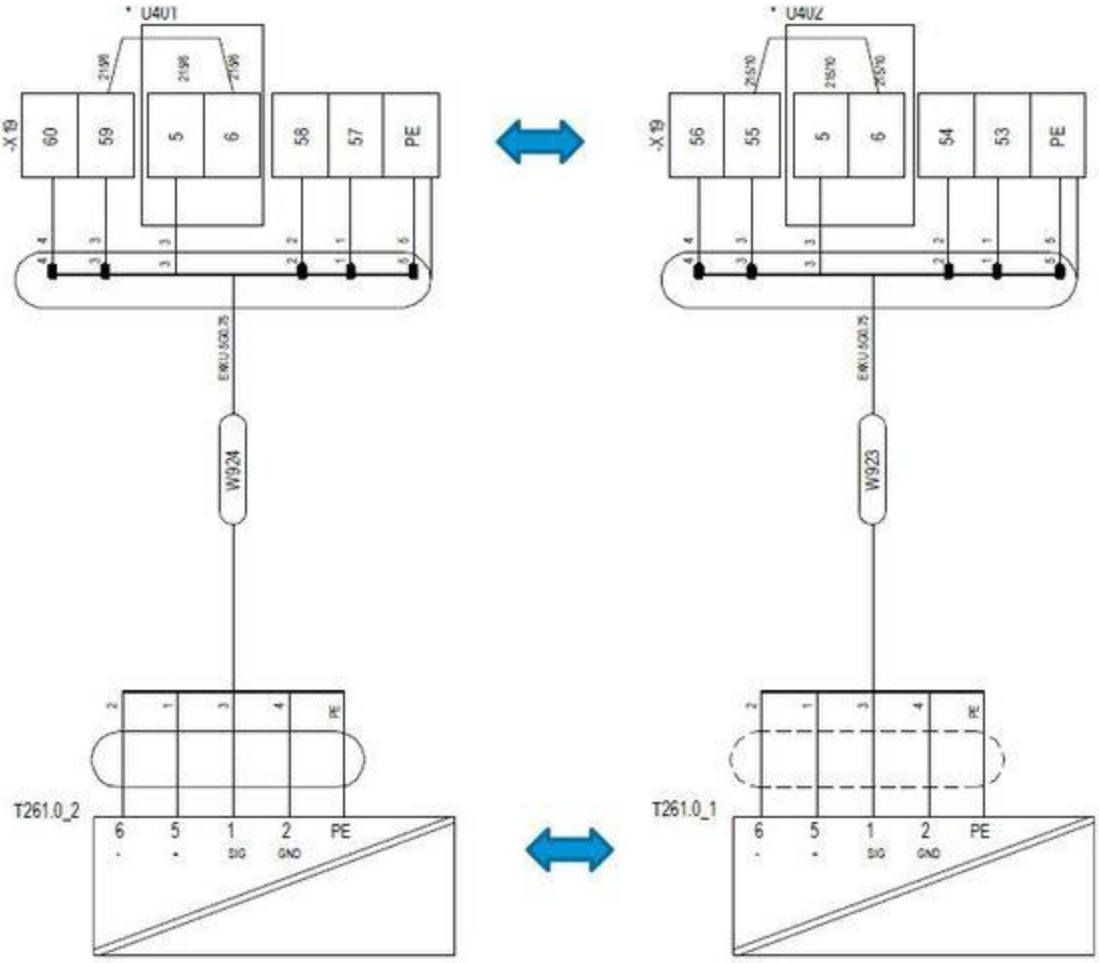
  Check for any loose connections on the Blade position sensor.


BALLUFF
BTL5-E10-M0950-A-SA211
-S135
071215573 HU

Swap the signal wire to the position transducer (Balluff) on the hub computer. If the fault follows to the new blade then the fault is either in the position transducer or one of the cables.



In the example below, we are swapping the plugs between blades C and B.



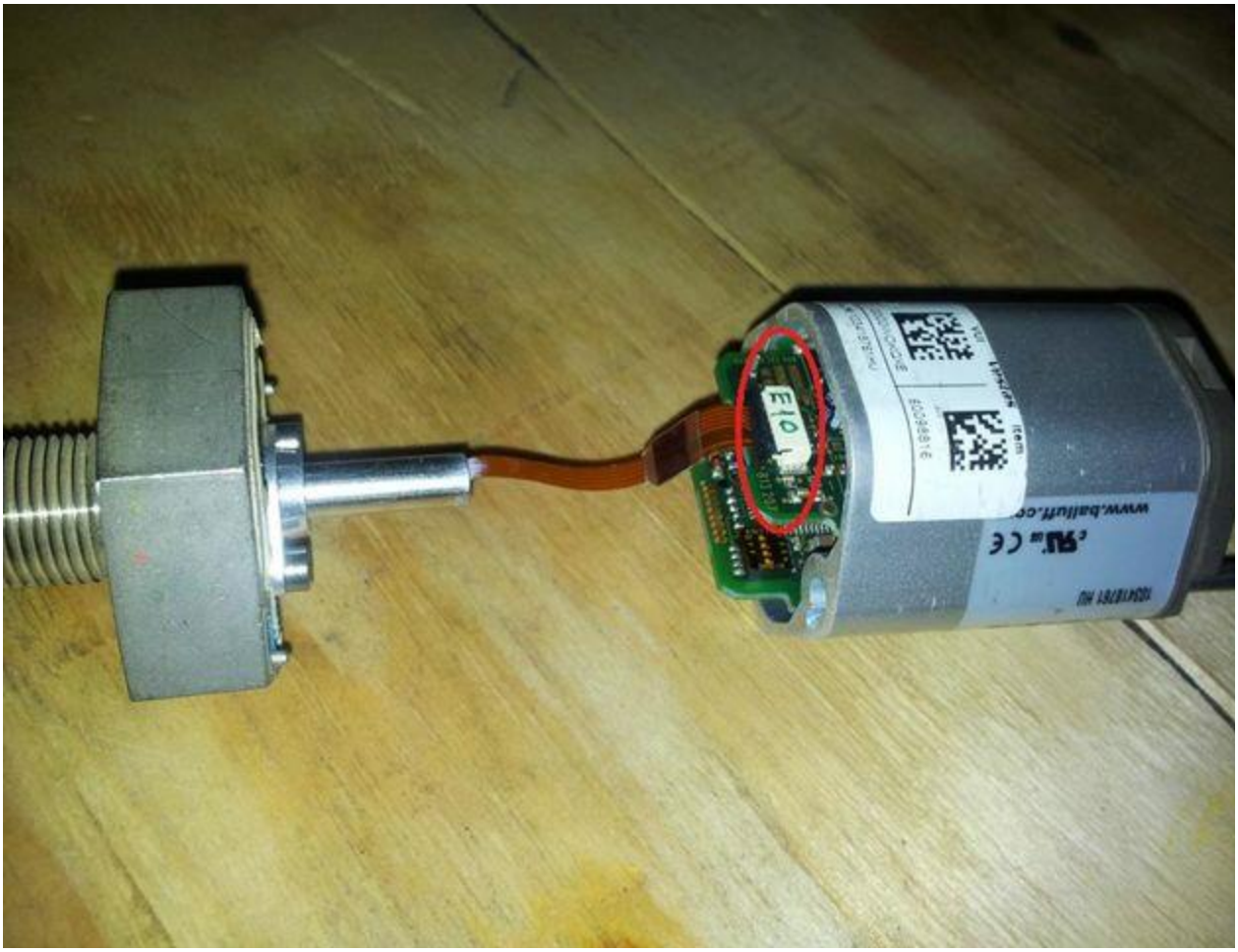
Place the cables back to their original position and then swap pitch position sensor from affected blade to another working blade.

If the alarm follows the valve to the other blade, the pitch position sensor is defective.

If it does not, the pitch position sensor is likely not the cause.

Pitch position sensor

Service Module



Check the cable for any or short due to the cable rubbing near the hub casting or friction between the cable and the hydraulic hose.

Replace any defective cables.

Relevant spare parts	
Description	**Item No.**
TRANSDUCER BTL5-E10-M0950-A-S	60098816

SERVICEMODUL, BTL5 - E10	60102394
Cable W 923 Pos.transducer 1 Std	60101018
Cable W 924 Pos.transducer 2 Std	60101148
Cable W 925 Pos.transducer 3 Std	60101149

Check the blade bearing greasing system and replace the failed components

Does this solve the problem?

1] Yes

2] No

3] I don't know

- **Explanation**
  IN THE HUB:

Manually operate the grease pump from the controller.

Check that the grease reaches all lubrication points on all blades.

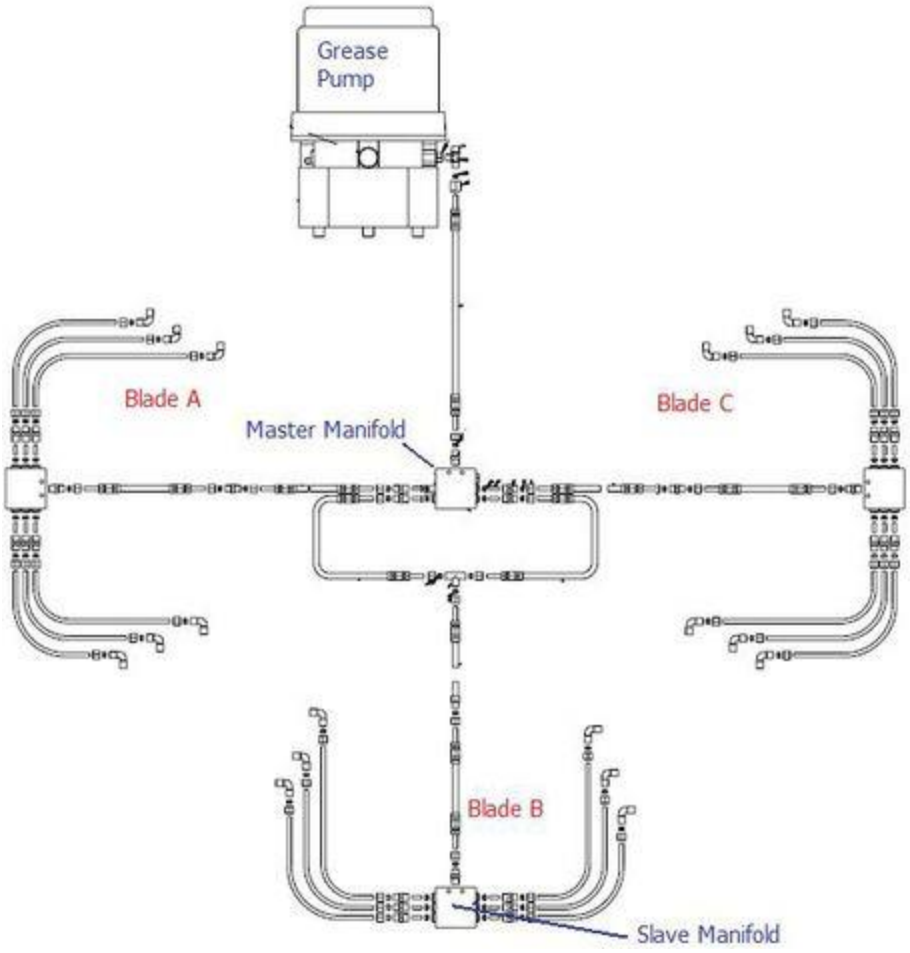
Relevant documentation	
Description	**DMS No.**
SII for Lubrication Unit for Blade Bearings	1001450

Check that the grease flows from all of the ports:

Inspect for any damaged hose fittings, manifold grease blockage or hose damage.

If necessary replace the manifolds and hoses.

Blade bearing greasing system:



Part number details for Blade bearing Greasing system:

Relevant spare parts	
Description	**Item No.**
GREASE PUMP P203 std.(with Molykote2+ grease)	60112213
GREASE PUMP P203 ARCTIC (with Fuchs Stabyl LT50 grease)	60067070
PUMP - BRG. GREASING SYS - STD	60073006

WING PL BRG. GREASING SYS –STD	60094070

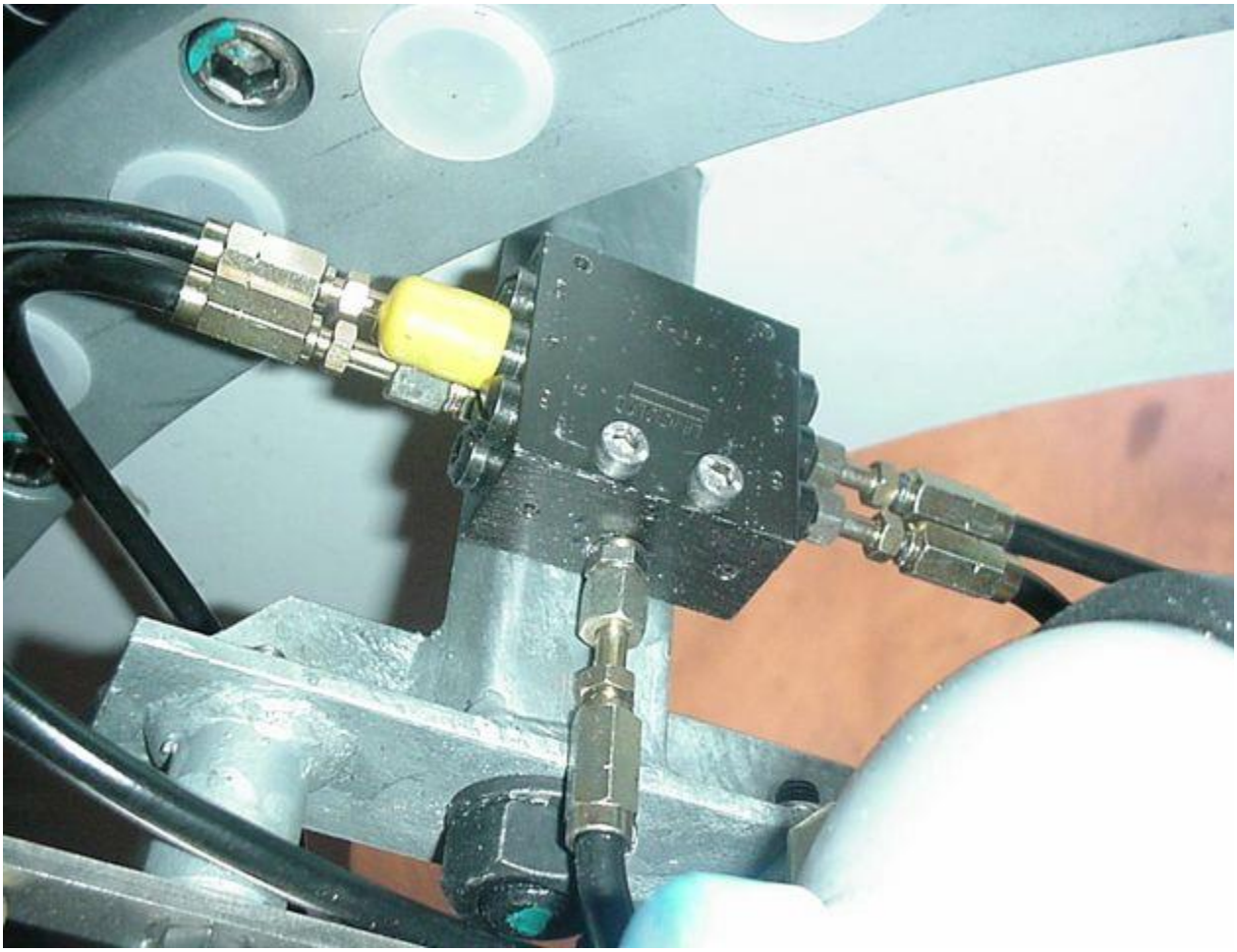
Part number for Grease pump with main manifold and hoses

(does not include blade hoses& manifolds)

Part number for full set of Slave manifolds (3 EA) with hose and accessories:

Sub - Part number details for hose accessories

COMPONENT	DESCRIPTION	QUANTITY PER	UM	Remarks
60067073	METERING DEVICE "PRIMARY"	1,000	EA	Distributor Manifold
60080996	GREASE HOSE ASSEMBLY (1210 MM.	1,000	EA	Hoses from pump to Distributor manifold to Slav Manifold
60080997	GREASE HOSE ASSEMBLY (390MM)	2,000	EA	
60080998	GREASE HOSE ASSEMBLY (7840 MM.	2,000	EA	
60080999	GREASE HOSE ASSEMBLY (6290 MM.	1,000	EA	
60111921	Protective hood /m.strop red	1,000	EA	Fittings& Accessories for above hose&Manifold
60111922	Elbow LL6MMx1/8K	1,000	EA	
60112211	Check valve ⅂6, high pressure	4,000	EA	
60112212	Protective cap f. quick fittin	4,000	EA	
60067074	METERING DEVICE "SECONDARY"	1,000	EA	Slave Manifold (for 1 blade
60067085	HOSE ⅂6 x 320MM (CUT LENGTH)	1,000	EA	Hoses from Slave manifol to Blade bearing (for 1 blade)
60067086	HOSE ⅂6 x 490MM (CUT LENGTH) S	1,000	EA	
60067087	HOSE ⅂6 x 1200MM (CUT LENGTH)	1,000	EA	
60067088	HOSE ⅂6 x 1380MM (CUT LENGTH)	1,000	EA	
60067089	HOSE ⅂6 x 2080MM (CUT LENGTH)	1,000	EA	
60067090	HOSE ⅂6 x 2250MM (CUT LENGTH)	1,000	EA	
60112212	Protective cap f. quick fittin	6,000	EA	Fittings& Accessories for above hose&Manifold (for
60112214	Quick fittings 90 elbow ⅂6	6,000	EA	

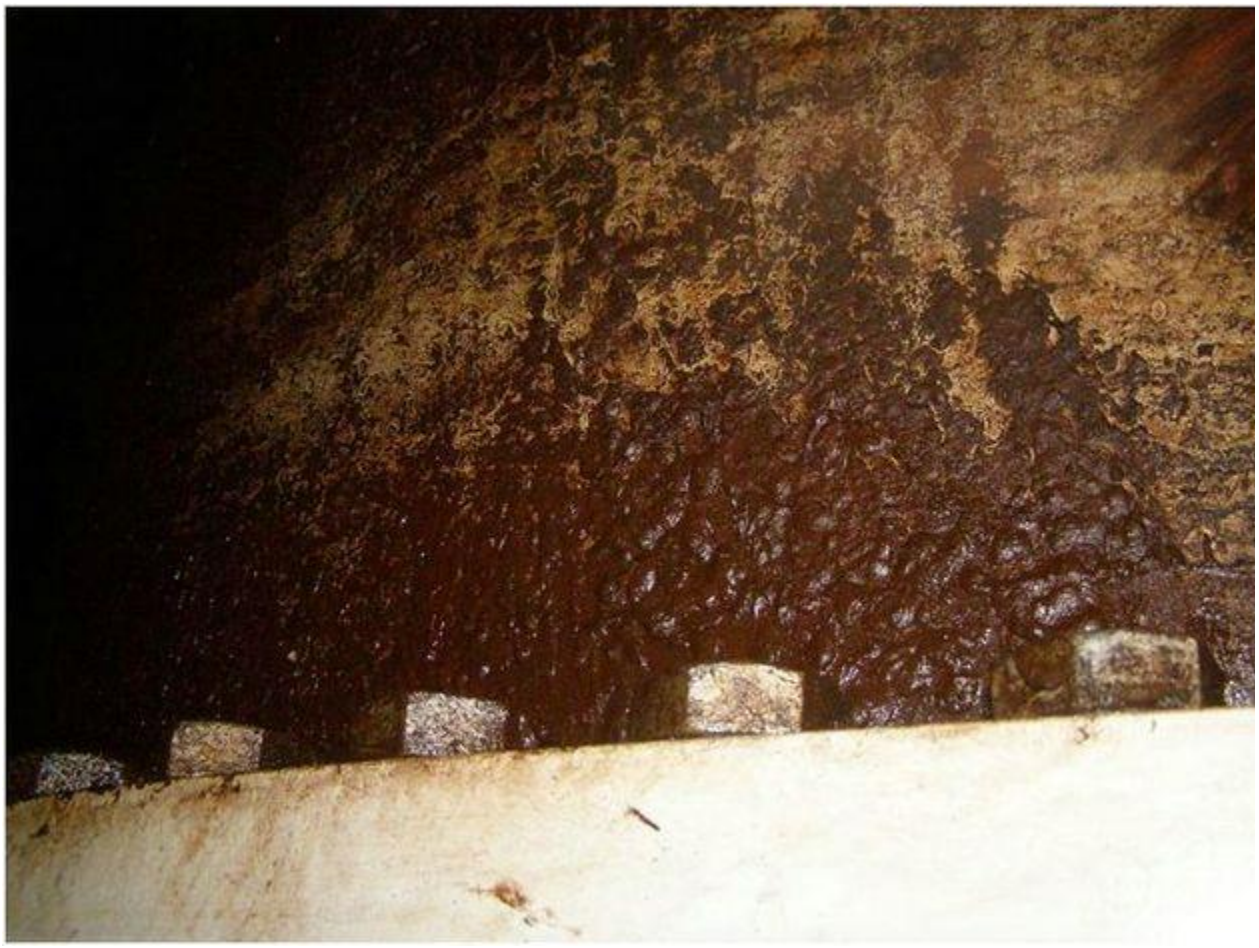


Check for blade bearing grease leaks:

Check blade bearings for any grease leak.

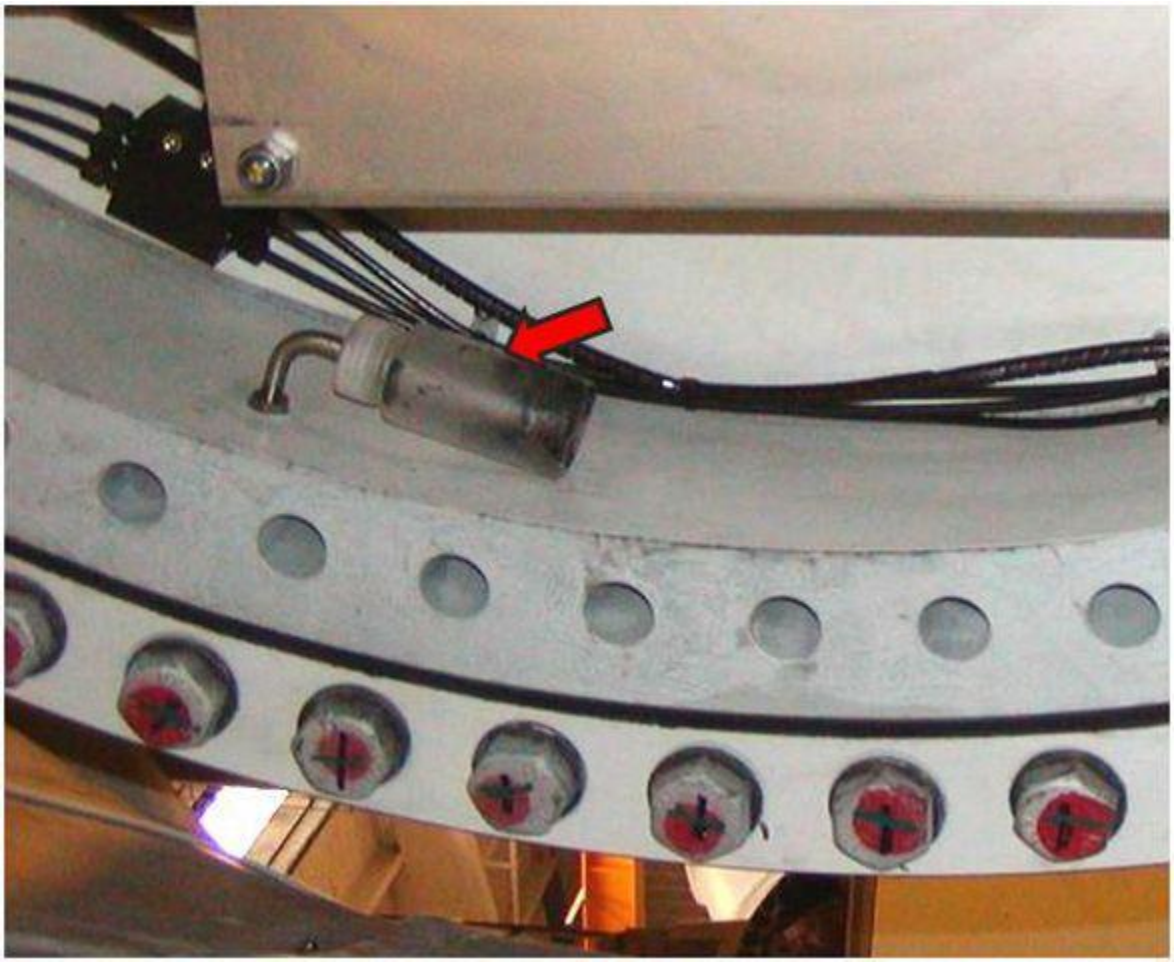
Check the hydraulic system for any leaks, isolate and repair any leaks if found.

Check for grease or oil stains on the blades and spinner.



Check the grease collector bottles in all blade roots. If there is a large volume of oil in the hub or evidence that oil has

penetrated into the bearing, perform a manual greasing operation on all of the blades.



Relevant documentation	
Description	**DMS No.**
Blade Bearing Manual Grease Procedure	0024-9719
Installation of IMO Retrofit Inner Blade Bearing Seal	0002-2266
Replacement of Outer IMO Blade Bearing Seal	0003-1177

Check the inner and outer blade bearing seals.

If there is any damage or heavy grease leak replace the seals.

Replace the defect Hub Computer

Does this solve the problem?

1] Yes

2] No

3] I don't know

- **Explanation**
  IN THE HUB:

  If after the blade calibration, there continue to be any pitch angle deviations, or the angle values show constant when

pitching the blades, the hub computer may be defective.

Relevant spare parts	
Description	**Item No.**
SIF HUB COMPUTER CABINET EVOII	51701801

Perform the blade bearing operation

Does this solve the problem?

1] Yes

2] No

3] I don't know

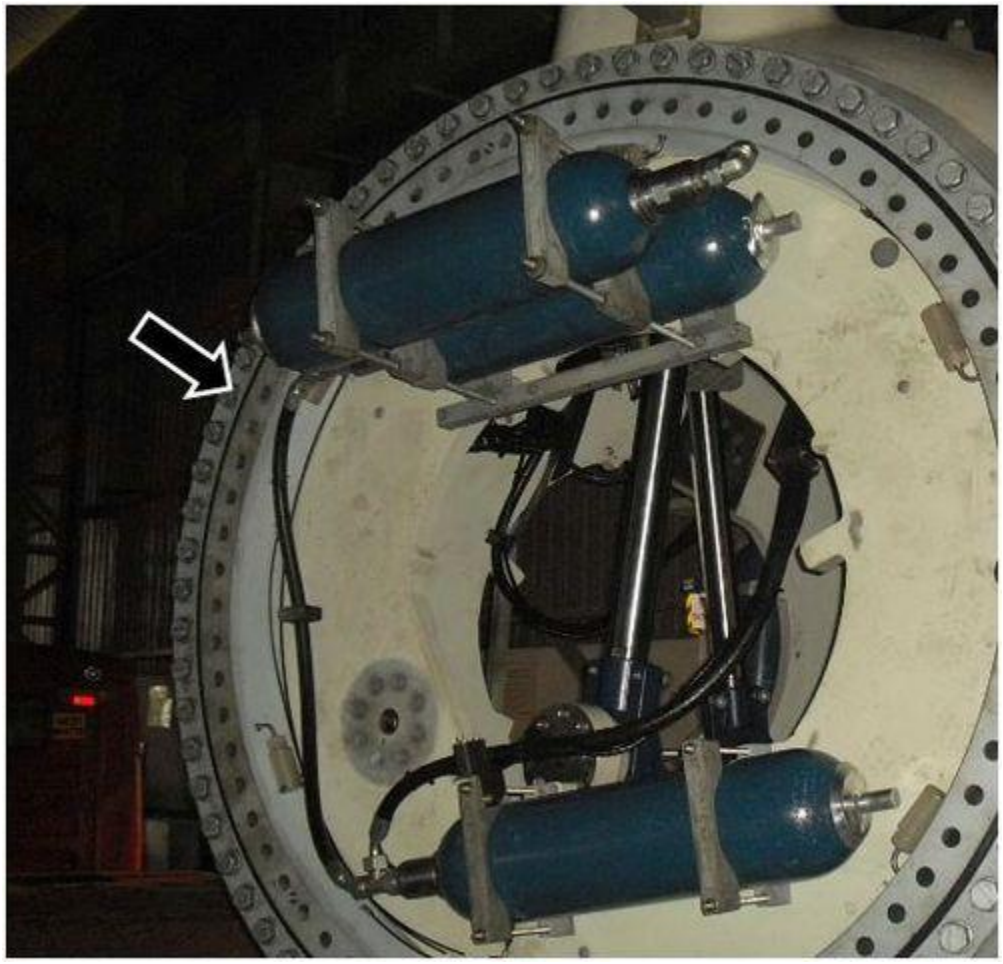
- **Explanation**
  IN THE HUB:

Check the Blade bearing operation 'Pitching to run' and 'Pitching to stop'.

Check for any blade vibration or any abnormal noise during operation.

Perform the Blade Pitch System Test

Relevant documentation	
Description	**DMS No.**
Blade Pitch System Test	0002-0467



If manual greasing does not solve the issue, likely it is the cause of blade bearing failure. Consult the SBU Engineering group to determine course of action and correct item number for the applicable blade bearing.

Relevant CIM case		
CIM case	**Task list**	**SWI**
1908		0003-1177
929		0002-2266

Relevant spare parts	
Description	**Item No.**
BLADE BEAR. STD. IMO -NEW SEAL (NM72)	60113392
BLADE BEARING STD LAULAGUN	60104445