ATA CHAPTER: 32

LANDING GEAR – MAIN GEARS AND DOORS – INSPECTION FOR LOOSE BOLT ON THE ACTUATOR MOUNTING BRACKET OF THE MAIN LANDING GEAR SHOCK STRUT

Mod No. 6366

1. PLANNING INFORMATION

A. EFFECTIVITY

(1) Aircraft:

Aircraft Mfg. Serial No's SAAB 2000 – 004 thru – 063.

NOTE: This Service Bulletin supersedes Service Bulletin No. SAAB 2000–32–057.

(2) Spares: Not affected.

B. REASON

One operator has reported that one of the two bolts attaching the actuator mounting bracket to the Main Landing Gear Shock Strut probably has been loose, causing the cross–bolt (the other attachment bolt) and bracket itself to fail. The gear was emergency released and landing was normal.

To prevent similar incidents, this Service Bulletin gives instructions for inspection of the bolt to make sure the bolt on the RH and the LH main landing gear shock strut is not loose. As corrective action, the attachment bolts are removed and correct number of washers installed to make sure that the installation is correct and correct torque is applied.

C. DESCRIPTION

This Service Bulletin gives instructions to:

Inspection:

– Inspect for loose bolt which attaches the actuator mounting bracket on to the main landing gear shock strut.

Corrective Action:

NOTE: The corrective action must be done irrespective of findings during the inspection.

– Lift the aircraft on the three main jacks, and remove the two bolts which attaches the actuator mounting bracket on to the shock strut.
– Inspect the bolts that attach the retract actuator bracket for corrosion
– Inspect the mounting bracket for signs of damage, cracks or other signs of deterioration
– Install bolts and correct washers to attach the actuator mounting bracket on to the main landing gear shock strut.

D. COMPLIANCE

Mandatory.

Inspection and corrective action to be performed within 12 month from release date of revision 01 of this Service Bulletin, dated 20 October 2009.

NOTE: The corrective action must be done irrespective of findings during the inspection.

This Service Bulletin is under EASA consideration for an Airworthiness Directive.

E. APPROVAL

The technical content of this Service Bulletin is approved under the authority of DOA nr. EASA.21J.066.

F. MANPOWER

Estimated time to complete this Service Bulletin is:

Estimated time for Inspection

1 persons required.

Total manhours: 1.0

Elapsed time (hours): 1.0

Estimated time for Corrective Action

2 persons required.

Total manhours: 10

Elapsed time (hours): 5

NOTE: Cure time for primer and sealant not included.

Labour cost at operators expense.

G. MATERIAL – COST AND AVAILABILITY

Price and availability for parts required to do this Service Bulletin will be furnished on request, please contact:

Saab Aerotech
Aircraft Services Division
Spares
SE–581 88 Linköping
Tel: +46 (0)13 18 5592

H. TOOLING

(1) Down lock tool, HMO917248 (to unlock the downlock mechanism on the drag brace).

NOTE: Down lock tool, HMO917248 only to be used during the corrective action procedure.

(2) Magnifying glass, minimum 10X magnification.

I. WEIGHT AND BALANCE

None.

J. ELECTRICAL LOAD DATA

Not affected.

K. REFERENCES

Aircraft Maintenance Manual (AMM)	TASK 07–10–00–582–807 TASK 07–10–00–582–808 TASK 29–10–00–860–802 TASK 29–10–00–860–803 TASK 32–12–00–010–801 TASK 32–12–00–410–801
Corrosion Prevention Manual (CPM)	20–10–10

L. OTHER PUBLICATIONS AFFECTED

Aircraft Maintenance Manual (AMM)	TASK 32–11–15–000–801 TASK 32–11–15–400–801
Illustrated Parts Catalog (IPC)	32–11–15–05

2. ACCOMPLISHMENT INSTRUCTIONS

WARNING: MAKE SURE THE SAFETY PIN ARE INSTALLED IN THE NOSE LANDING GEAR AND IN THE MAIN LANDING GEARS. THE LANDING GEARS CAN RETRACT AND CAUSE INJURY TO PERSONS.

A. JOB SET–UP

(1) Before you start the SB, make sure:
- The modification kit contains the parts listed in the Service Bulletin
- The local supply items listed in the Service Bulletin are available
- The documentation is available
- The special tools are available.

(2) Release the pressure from the hydraulic system (number 2 system) (REF. AMM TASK 29–10–00–860–803).

(3) Open the forward doors of the main landing gear (REF. AMM TASK 32–12–00–010–801)

B. INSPECTION

REF. FIG. 1

NOTE: The following procedure is applicable to the LH and the RH main landing gear shock strut.

(1) Do the inspection of the bolt which attaches the actuator mounting bracket on to the main landing gear shock strut.

(a) Remove sealant from the bolt (4) and the nut (8).

(b) Remove and discard the cotter pin (9).

(c) Set a torque wrench to the minimum specified torque for the nut (8) (33 Nm (290 lbf.in).

(d) Use the torque wrench and make sure that the top bolt (4) and the nut (8) which attach the actuator mounting bracket (15) on to the shock strut (10) does not turn. If you can turn the bolt (4) or the nut (8), the installation is classified as loose.

1 If the bolt (4) or the nut (8) is not loose, do the following steps:,

a Install a new cotter pin (9).

b Use the sealant (AMS–S–8802) and cover the head of the bolts (4) and the nut (8).

c Continue with para D. (JOB CLOSE–UP) (or continue with para C. if the corrective action is to be performed at the same time as the inspection).

2 If the bolt (4) or the nut (8) is loose, discard the bolt (4) and continue with the corrective action, Ref. para C. and make a request for the parts required for the corrective action.

C. CORRECTIVE ACTION

REF. FIG. 2, 3

WARNING: BE CAREFUL WHEN YOU USE THE CONSUMABLE MATERIAL(S). YOU MUST OBEY THE OPERATOR'S AND MANUFACTURER'S HEALTH AND SAFETY INSTRUCTIONS. THE CONSUMABLE MATERIAL (S) CAN CAUSE INJURY OR DEATH TO PERSONS.

NOTE: The following procedures are applicable to the LH and the RH main landing gear shock strut.

(1) Lift the aircraft on the three main jacks (REF. AMM TASK 07–10–00–582–807).

(2) Disconnect the retract actuator from the shock strut.

REF. FIG. 2

WARNING: MAKE SURE YOU RELEASE THE PRESSURE FROM THE HYDRAULIC SYSTEM BEFORE YOU DISCONNECT THE RETRACT ACTUATOR. THE PRESSURIZED HYDRAULIC FLUID CAN CAUSE THE RETRACT ACTUATOR TO MOVE WHEN IT IS DISCONNECTED, AND CAUSE INJURY TO PERSONS.

(a) Make the hydraulic systems safe for the maintenance procedure (Ref. TASK 29–10–00–860–802).

(b) Remove the the cotter pin (18) the nut (17) and the washer (16) from the bolt (3). Discard the cotter pin (18).

(c) Hold the actuator (2) and remove the bolt (3). Disconnect the actuator (2) from the actuator mounting bracket (15).

(d) Use a temporary cable tie to safety the actuator (2) away from the work area.

(3) Remove the actuator mounting bracket and the two attachment bolts from the shock strut.

REF. FIG. 2

(a) Remove the safety pin from the shock strut.

(b) Use the down lock tool (HMO917248) to unlock the downlock mechanism on the drag brace. Move the shock strut towards the retracted position until you get sufficient clearance to the nuts (8) and (12).

(c) Use a suitable support to hold the landing gear in position.

(d) Remove the bolt (4) installed on the top of the actuator mounting bracket

1 Remove and discard the cotter pin (9).

2 Remove the the nut (8), the lock washer (7), the bolt (4) and the washer (5 or/and 6). Discard the lock washer (7) and the washer (5 or/and 6).

(e) Remove the bolt (1) installed on the bottom of the actuator mounting bracket

1 Remove and discard the cotter pin (11).

2 Remove the nut (12) and the washer (13 or/and 14), and the bolt (1). Discard the washer (13 or/and 14).

(f) Remove the actuator mounting bracket (15) from the shock strut (10).

(4) Inspect the bolts, the actuator mounting bracket and the shock strut.

NOTE: For description and identification of corrosion, refer to CPM 20–10–10.

(a) Inspect the bolt (1) for uniform and fretting corrosion. Make sure there is no uniform or fretting corrosion in the threads or in the radius at the head of the bolt.
- If no uniform or fretting corrosion is found, continue with step (b), inspection of the bolt (4).
- If uniform or fretting corrosion is found in the threads or in the radius at the bolt head, discard the bolt (1).
- If uniform or fretting corrosion is found on the outside diameter of the bolt shaft, do the following steps:

1 Use a Scotch Brite pad (Type A, very fine) and lightly polish until the corrosion is removed.

2 Use a magnifying glass (minimum 10 X magnification) together with a strong light source and inspect the bolt again for pitting corrosion.
- If pitting corrosion is found, discard the bolt.
- If no pitting corrosion is found, apply a thin layer of the epoxy primer PR143 (MIL–PRF–23337) on the bolt. Let the primer become dry before installation.

(b) Inspect the bolt (4) for uniform and fretting corrosion.
- If no uniform or fretting corrosion is found, continue with step (c), inspection of the actuator mounting bracket and the shock strut.
- If uniform or fretting corrosion is found, do the following steps:

1 Use a Scotch Brite pad (Type A, very fine) and lightly polish until the corrosion is removed.

2 Use a magnifying glass (minimum 10 X magnification) together with a strong light source and inspect the bolt again for pitting corrosion.
- If no pitting corrosion is found, apply a thin layer of the epoxy primer PR143 (MIL–PRF–23337) on the bolt. Let the primer become dry before installation.
- If pitting corrosion is found, discard the bolt.

(c) Inspect the actuator mounting bracket (15) and the shock strut (10)

1 Visually inspect:
- The actuator mounting bracket (15)
- The surface of the shock strut (10) (where the actuator mounting bracket is attached) for signs of damage, cracks or other signs of deterioration. Make sure it is in serviceable condition.

If there are signs of damage, cracks or other signs of deterioration you must contact:

APPH Runcorn
Engineering
1 Pembroke Court, Manor Park
Runcorn, WA7 1TG, England
Tel: +44 (0)1928 532600
Fax: +44 (0)1928 579626

(5) Install the actuator mounting bracket on to the shock strut

REF. FIG. 3

(a) Apply a thin layer of grease (Aeroshell 33 or Mobilegrease 33) on to the contact surface of the actuator mounting bracket (15).

(b) Install the actuator mounting bracket (15) in position on the shock strut (10).

(c) Apply a thin layer of grease (Aeroshell 33 or Mobilegrease 33) on the bolts (1 and 4).

(d) Install the locking washer (20) and the washer (21) on the bolt (4). Install the bolt (4) together with the locking washer (20) and the washer (21).

(e) Install the washer (22), the washers (23) and the nut (8) on the bolt (4). Only tighten the nut (8) at this time.

(f) Install the bolt (1), the washers (24) and the nut (12). Only tighten the nut (12) at this time.

(g) Remove the safety pin from the shock strut.

(h) Use the down lock tool (HMO917248) to unlock the downlock mechanism on the drag brace. Move the shock strut towards the retracted position until you get sufficient clearance to use the torque wrench.

(i) Support the shock strut in this position.

(j) Torque the nut (12)

1 Use a torque wrench and torque the nut (12) to between 123.9 – 147.0 Nm (1097 – 1301 lbf.in).

2 Torque to the minimum torque figure and try to install the cotter pin (11). If necessary, increase the torque in increments up to the maximum torque figure. Try to install the cotter pin (11) at each increment. If you can not install the cotter pin (11), remove one thin washer (24) and do the torque procedure again.

NOTE: Do not loosen the nut (12) to permit the installation of the cotter pin (11).

3 Install a new cotter pin (11).

(k) Torque the nut (8)

1 Use a torque wrench and torque the nut (8) to between 33 – 46 Nm (290 – 410 lbf.in).

2 Torque to the minimum torque figure and try to install the cotter pin (9). If necessary, increase the torque in increments up to the maximum torque figure. Try to install the cotter pin (9) at each increment. If you can not install the cotter pin (9), remove the thin washer (23) and do the torque procedure again.

NOTE: Do not loosen the nut (8) to permit the installation of the cotter pin (9).

3 Install a new cotter pin (9).

(l) Cover the heads of the bolts (1 and 4) and the nuts (8 and 12) with sealant

1 Use a clean lint–free cloth and MEK to clean the areas around the head of the bolts (1 and 4) and the nuts (8 and 12). Make sure any grease is removed and the areas are dry.

2 Use the sealant (AMS–S–8802) and cover the head of the bolts (1 and 4) and the nuts (8 and 12).

(m) Carefully extend the shock strut, and install the safety pin.

(6) Connect the retract actuator to the shock strut.

REF. FIG. 3

(a) Hold the retract actuator (2) and remove the temporary cable tie.

(b) Position the end of the actuator (2) to the actuator mounting bracket (15) and align the holes in the two components.

(c) Apply a thin layer of grease (Aeroshell 33 or Mobilegrease 33) on the bolt (3).

(d) Install the bolt (3) the washer (16) and the nut (17).

(e) Use a torque wrench and torque the nut (17) to between 84.7 – 96.0 Nm (750 – 850 lbf.in). Install a new cotter pin (18).

D. JOB CLOSE–UP

(1) Lower the aircraft and remove the three main jacks (REF. AMM TASK 07–10–00–582–808).

(2) Close the forward doors of the main landing gear (REF. AMM TASK 32–12–00–410–801).

(3) Write in the applicable aircraft records and the log card for the MLG shock strut that you have done all the work given in this Service Bulletin.

3. MATERIAL INFORMATION

A. Parts required for corrective action:

NOTE: The parts listed below are necessary for the corrective action and contains material for one shock strut assembly.

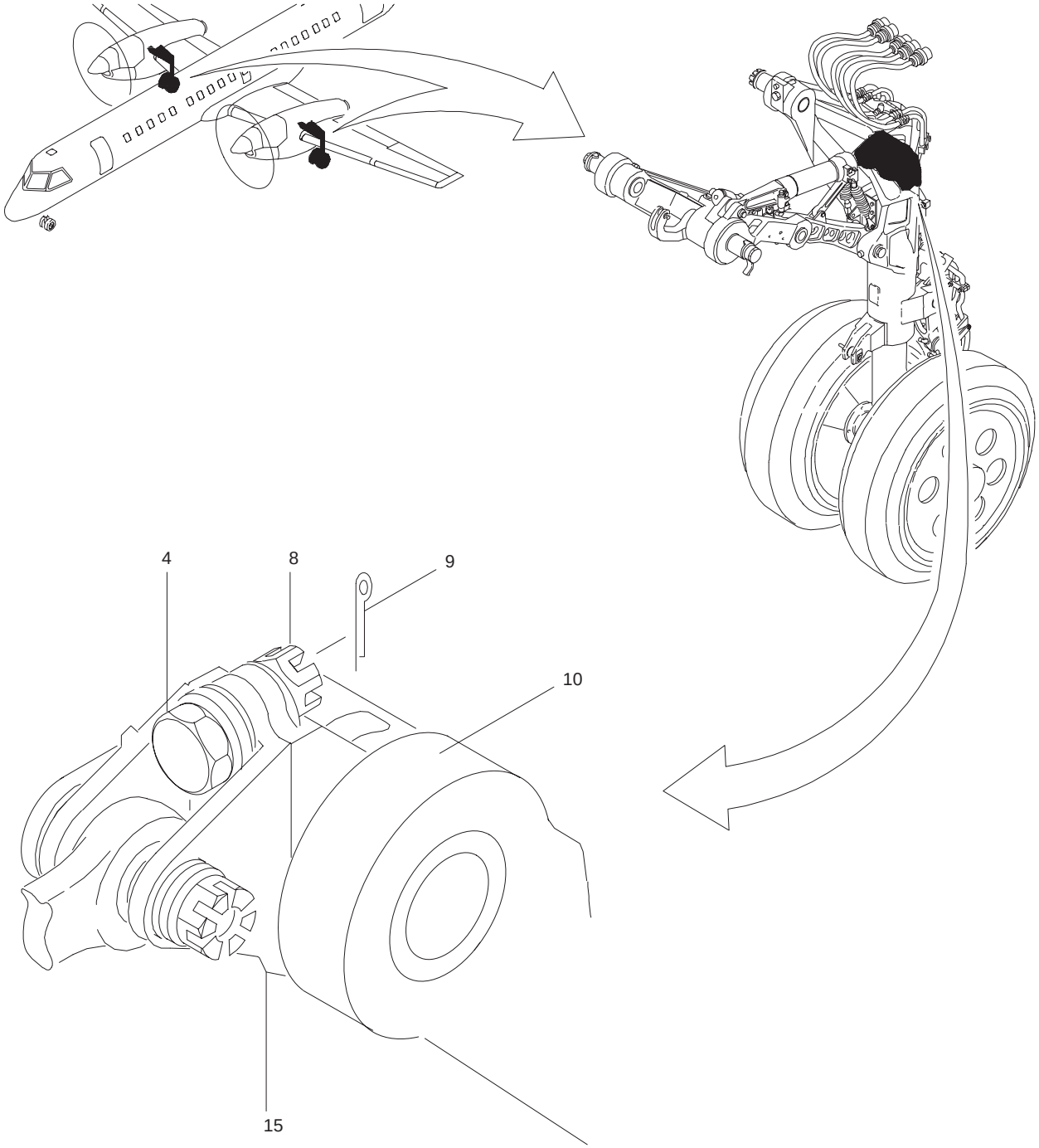
Fig–Item	Part Number	Qty	Nomenclature	Designation	Remarks
3–1	AIR132922	1	Bolt	–	Required if damaged bolt, corrosion in threads, in bolt head radius or pitting corrosion is found
3–4	NAS1308–17D Optional P/N NAS6608–D17	1	Bolt	–	Required if damaged bolt or pitting corrosion is found
3–9	MS24665–302 Optional P/N NASM24665–302	1	Cotter pin	–	–
3–11 and 3–18	MS24665–372 Optional P/N NASM24665–372	2	Cotter pin	–	–
3–20	MS35338–48	1	Washer, Locking	–	–
3–21	NAS1149F0832P Optional P/N AN960–816L	1	Washer	–	–
3–22	NAS1149F0863P Optional P/N AN960–816	1	Washer	–	–
3–23	NAS1149F0832P Optional P/N AN960–816L	2	Washer	–	–
3–24	AN960–1016L Optional P/N NAS1149F1032P	3	Washer	–	–

B. Local supply

Item	Part Number	Qty	Nomenclature	Designation	Remarks
–	Aeroshell 33 or Mobilgrease 33	A/R	Grease	–	Ref. Grease 1, AMM 12–40–00–00.
–	MIL–PRF–23377, Type 1 Class C	A/R	Epoxy Primer	Bolt (3–1 and 3–4)	PR 143
–	AMS–S–8802 alt. MIL–G–8802	A/R	Sealant	Bolt (3–1 and 3–4) and Nut (3–8 and 3–12)	–

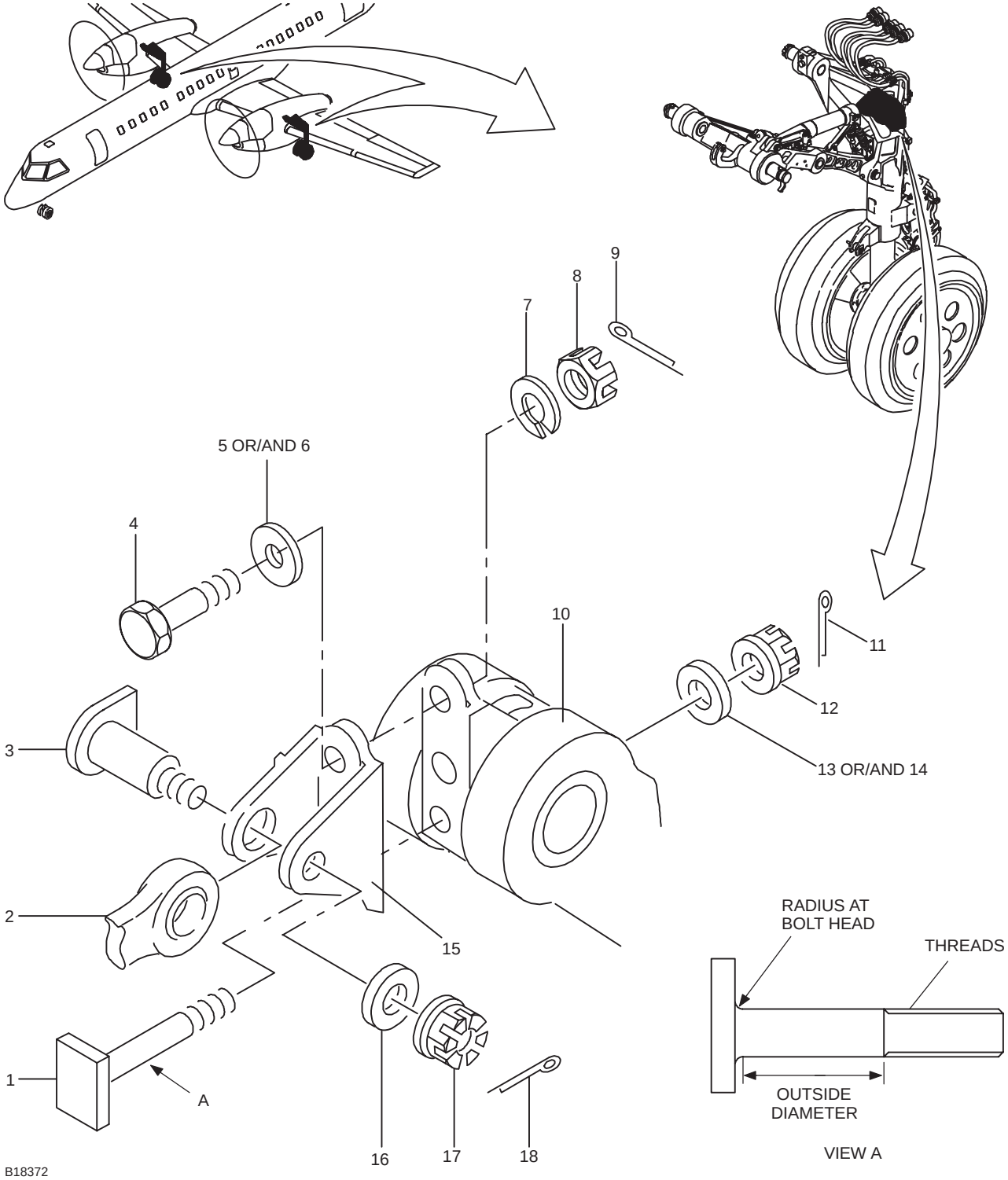
C. Removal

Fig–Item	Part Number	Qty	Nomenclature	Designation	Remarks
2–1	AIR132922	1	Bolt		Inspect or replace
2–4	NAS1308–17D	1	Bolt		Inspect or replace
2–5	AN960–816	1	Washer		Discard
2–6	AN960–816L	1	Washer		Discard
2–7	MS35338–48	1	Lockwasher		Discard
2–9	MS24665–302	1	Cotter pin		Discard
2–11	MS24665–372	1	Cotter pin		Discard
2–13	AN960–1016L	1	Washer		Discard
2–14	AN960–1016	1	Washer		Discard

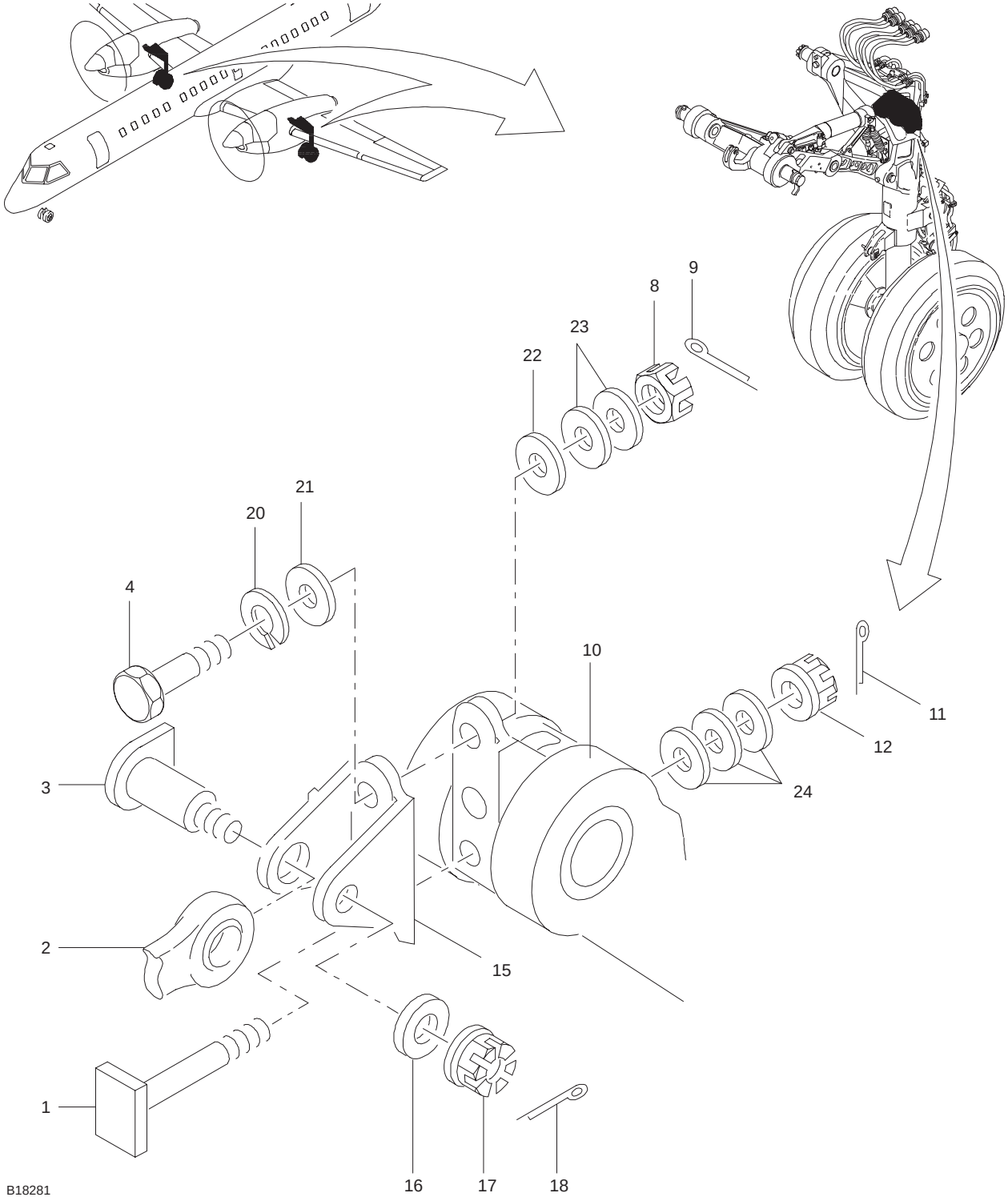


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Inspection for loose Bolt
FIG. 1



Corrective Action (Pre Mod) – Removal
FIG. 2



Corrective Action (Post Mod) – Installation
FIG. 3