

Electric System (IBBS / CAS Message / Fillerneck bonding)
SERVICE BULLETIN BRISTELL B23

Office of Airworthiness release

Date:

Name: [Released by]

Signature:

Verification Engineer

I hereby declare that the technical content of this document is correct and can be used to fulfil the obligations of the type design holder per 21.A.265(h)

Date:

Name: [Checked by]


Signature:

Author

Date:

Name: Marcus Basien;E. v/d Snoek

Signature:

Aircraft Design Certification GmbH Reichensteinstr.48 69151 Neckargemünd		Electric System (IBBS / CAS Message / Fillerneck bonding)	Doc-Nr: ADxC-73-SB-037 Issue: A Date: 23.11.2023 Change Nr.: DC-104
Service Bulletin Bristell B23			

Amendments

Issue	Reason	Date
A	Initial issue	23.11.2023

Electric System (IBBS / CAS Message / Fillerneck bonding)

- I. IBBS:
 - a design improvement of the IBBS (backup battery) GND return wiring is introduced. The original installation is adequate for normal operating conditions, but does not enable use of full IBBS potential in certain failure or degraded state.

- II. External Alternator bonding
 - On all B23 variants (with Rotax 912 and Rotax 915iS engine) a separate bonding/return cabling is needed for the external alternator. Bonding/ground return through the mechanical metal connections are unreliable due to surface treatment. Insufficient conductivity leads to engine block electric potential variations resulting in erroneous sensor reading and reduced external alternator performance.

- III. ALT 2 and ALT C CAS:
 - On some serial numbers of B23 aircraft variants (B23 / B23-915) the CAS message "ALT 2" and "ALT C" respectively erroneously may be programmed "white" while AFM and type design definition is "amber". This shall be checked and corrected.


- IV. ALT C Capacitor:
 - On 915iS (B23-915 / B23-915-G500) variants a design improvement is introduced adding a capacitor. The electric system voltage characteristics with combined failure (or disconnection of) GEN A/B and main battery, leaving ALT C as the only source, is improved.

- V. Fuel filler neck bonding:
 - Production observation showed a wide range of resulting fuel filler neck bonding quality due to sealant and filler neck surface anodization. All affected airplanes are checked and, if the bonding is not within limits, changed accordingly.

- VI. Cockpit light dimmer potentiometers secured against rotation:
 - In case of not properly torqued, the potentiometers could get loose and rotate when being actuated. All affected airplanes are checked and properly torqued if necessary. Alternatively, a securing potentiometer bed can be installed to avoid this rotation.

- VII. ALT 2 and ALT C R1 Resistor exchange (optional):
 - The resistor is attached directly to the alternator. Vibrations can cause this resistor connection to brake. The resistor can be replaced with a sturdier resistor and can be installed at a location closer to the firewall, where less vibrations are present.

STANDARD

Aircraft Design Certification GmbH Reichensteinstr.48 69151 Neckargemünd		Electric System (IBBS / CAS Message / Fillerneck bonding)	Doc-Nr: ADxC-73-SB-037 Issue: A Date: 23.11.2023 Change Nr.: DC-104
Service Bulletin Bristell B23			

0 General


0.1 ATA Code

ATA 24 ELECTRICAL POWER

0.2 Effectivity

All BRM Aero B23 models, all serial numbers:

- without installed DC-104.
- TCDS: EASA.A.642

Aircraft Design Certification GmbH Reichensteinstr.48 69151 Neckargemünd		Electric System (IBBS / CAS Message / Fillerneck bonding)	Doc-Nr: ADxC-73-SB-037 Issue: A Date: 23.11.2023 Change Nr.: DC-104
Service Bulletin Bristell B23			

1 Planning information

1.1 Reason

Correction of (potential) non-conformities and design rectifications.

1.2 Safety Intent

The safety intent is N/A.

1.3 Configuration Description

If criteria in Section 0 met,

- On all affected airplanes: change IBBS GND return wiring according detail instructions section 3
- On all affected airplanes: retrofit external alternator AWG8 ground wire.
- On all affected airplanes: Check ALT 2 (912) or ALT C (915) CAS message and correct if needed according detail instructions section 3
- On all affected 915iS engine variants install capacitor according instructions section 3
- On all affected airplanes: measure fuel filler neck to exhaust resistance, and correct if needed according detail instructions in section 3.
- On all affected airplanes: torque the potentiometers and if necessary, install a securing potentiometer bed according to the instruction in section 3.
- Optionally replace the R1 resistor of the ALT 2 (912) or ALT C (915) by a sturdier one.

1.4 Compliance

If criteria in Section 0 is met

Service bulletin must be accomplished

- This SB could be made mandatory by an EASA AD.
 This SB is mandatory as per EASA AD no. xyxyx

Service bulletin recommended to be accomplished to prevent significant operational disruptions

Service bulletin to introduce improvements

Service bulletin for convenience or option

1.5 Approval statement


The technical content of this document is approved under the authority of the DOA ref. EASA. 21J.411.

1.6 Concurrent publications

ADxC-73-AMM-001 Edition 2.2
ADxC-73-AMM-003 Edition 1.1
ADxC-73-AMM-049 Edition 1.2
ADxC-73-AMM-070 Edition 1.1

1.7 Manpower

Approx. 8 hours are required to accomplish this SB.

Aircraft Design Certification GmbH Reichensteinstr.48 69151 Neckargemünd		Electric System (IBBS / CAS Message / Fillerneck bonding)	Doc-Nr: ADxC-73-SB-037 Issue: A Date: 23.11.2023 Change Nr.: DC-104
Service Bulletin Bristell B23			

1.8 Weight and Balance

n/a

1.9 Electrical load data

n/a

1.10 Software modification

n/a

1.11 Referenced documentation

For all aircraft models:

- 34B220204N issue A

For B23:

- 34B220000N issue E
- 34B220200N issue E
- 34B240000N issue D
- 34B200000N issue F

For B23;, B23-915

- 34B520000N issue C
- 34B520200N issue C
- 34B950106N issue A
- 34B500000N issue C
- 34B540000N issue B

For B23;, B23-912-G500


- 34B620000N issue B

For B23;, B23-915-G500

- 34B920000N issue B

1.12 Other publications effected

n/a

Aircraft Design Certification GmbH Reichensteinstr.48 69151 Neckargemünd		Electric System (IBBS / CAS Message / Fillerneck bonding)	Doc-Nr: ADxC-73-SB-037 Issue: A Date: 23.11.2023 Change Nr.: DC-104
Service Bulletin Bristell B23			

2 Material information

2.1 Material- cost – availability

For material cost contact BRM Aero

2.2 Company support information

Affected publications and parts can be ordered from

BRM AERO, s.r.o.

Address: Letecká 255 686 04 Kunovice Czech Republic

Phone: + 420 773 984 338

E-mail 1: info@brmaero.com


E-mail 2: aero.brm@gmail.com

Web: <http://www.brmaero.com>

Affected documentation can be downloaded from

<https://www.bristell.com/technical-documentation/>

For the latter login credentials must be ordered form BRM Aero, s.r.o.

Aircraft Design Certification GmbH Reichensteinstr.48 69151 Neckargemünd		Electric System (IBBS / CAS Message / Fillerneck bonding)	Doc-Nr: ADxC-73-SB-037 Issue: A Date: 23.11.2023 Change Nr.: DC-104
Service Bulletin Bristell B23			

2.3 Material requirements per aircraft

- I. IBBS GND Wire
 - AWG-20 ground wire and standard part according to 34B220000N (Rotax 912), 34B520000N (Rotax 915iS), 34B920000N (Rotax 915-G500), 34B620000N (Rotax 912-G500).

- II. External alternator ground return wire
 - Alternator bonding cable 34B220203N
 - Standard Parts as per 34B220204N installation drawing.

- III. ALT 2 and ALT C CAS Rotax 912 and Rotax 915iS variants (without G500)
 - no material required

- IV. ALT C Capacitor (ROTAX 915iS variants only)
 - Capacitor Cable Harness PN 34B950105N
 - Capacitor 22.000µF ADxC-73-DDP-2482
 - Standard Parts as per 34B950106N installation drawing

- V. Fuel filler neck bonding
 - If measured bonding is insufficient (minimum) two rivets D4.2mm PN 1201-4008 per tank.
 - Mastic and top coat

- VI. Light dimmer potentiometers
 - Optional:
 - o Potentiometer bed Part number 25B200060N
 - o Polyurethane sealant Emfimastic PU50


- VII. ALT2 and ALTC R1 resistor improvement
 - Optional:
 - o Resistor R1 2.2kΩ RN60D2201FB14
 - o Splices SP121 and SP122
 - o M22759/16-20-9 (AWG 20) wire
 - o Other wires as required iaw drawing 34B220000N (Rotax 912), 34B520000N (Rotax 915iS), 34B920000N (Rotax 915-G500), 34B620000N (Rotax 912-G500).

2.4 Rework parts

n/a

2.5 Special tooling

n/a

Aircraft Design Certification GmbH Reichensteinstr.48 69151 Neckargemünd		Electric System (IBBS / CAS Message / Fillerneck bonding)	Doc-Nr: ADxC-73-SB-037 Issue: A Date: 23.11.2023 Change Nr.: DC-104
Service Bulletin Bristell B23			

3 Accomplishment/Instructions

3.1 IBBS

- Replace the IBBS battery AWG-20 ground cable by three AWG-20 ground wires according to drawing 34B220000N (Rotax 912), 34B520000N (Rotax 915iS), 34B920000N (Rotax 915-G500), 34B620000N (Rotax 912-G500).

3.2 External alternator ground return

Install the alternator bonding cable 34B220203N according to drawing 34B220204N and 34B240000N (912) or 34B540000N (915).

3.3 ALT 2, ALT C CAS Message

- In the G3X, enter the configuration mode iaw Garmin G3X Touch Installation Manual 190-01115-01 Section 35.2.
- Navigate to “Engine Information System Configuration”
- Enter the ALT 2 or ALT C menu under „GEA 24 discrete input“
- Change the alert colour to YELLOW.
- Exit the configuration mode selecting the save and reboot option.

3.4 ALT C Capacitor retrofit

- Install the Capacitor Cable Harness PN 34B950105N and the 22.000µF capacitor (ADxC-73-DDP-2482) according to drawing 34B950106N and 34B540000N.

3.5 Filler neck bonding

Testing the conductivity:

Using a good quality multimeter (bonding checker) measure and adequate length of test lead wiring:


- Check resistance of multimeter wiring (direct connection of used wire ends)
- Check resistance of electric path filler neck to exhaust.

Explanation: The standard point of bonding the aircraft when filling fuel is the exhaust. Static charge potentially built up in previous flight or due to flowing fuel must safely be discharged, respectively the entire airframe must be on the same electric potential than the fuelling station.

The filler neck original part as delivered features a anodised surface which for the practical purposes of discharging is isolating. The (improved) rivet connection drills out some material providing a clean, not anodised surface, the (new) rivet bridges from the filler neck to the skin. In production this clean surface inconsistently is wetted with sealing compound preventing good conductivity.

When performing the test:

- Make sure the connection on both ends is in good condition. On the exhaust use a clamp on a cleaned surface. This cleaning can be accomplished locally with a bit of sandpaper.

Aircraft Design Certification GmbH Reichensteinstr.48 69151 Neckargemünd	 adxc aircraft design certification gmbh	Electric System (IBBS / CAS Message / Fillerneck bonding)	Doc-Nr: ADxC-73-SB-037 Issue: A Date: 23.11.2023 Change Nr.: DC-104
Service Bulletin Bristell B23			




- On the filler use a sharp test head poking with force through the actual surface OR use a tube, simulating the fuel-filler “pistol” and rotate with moderate force against the inner flange edge. Do not measure on the rivets or skin or filler cap.

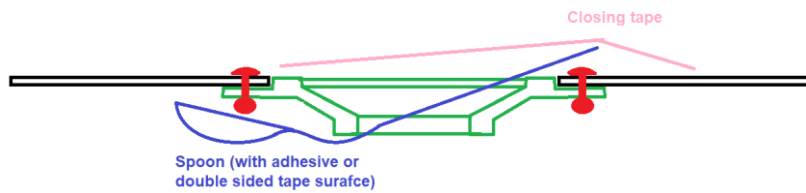


- The acceptable resistivity is $R < 50\text{m}\Omega$. The measured resistivity of the wiring alone must be accounted for (tara). Hence, measurement point to point max 0.05Ω + measurement wiring.
- Test must be performed for each tank.


Rework if resistivity is not acceptable

- Before commencing with rework make sure that the (not acceptable) result is really due to the filler neck mounting by performing the same type of measurement between filler neck and wing structure (by using an arbitrary access hatch screw head) and between exhaust and wing structure. If it is determined that the bonding between wing structure and exhaust is the problem contact ADxC/BRM for further instructions.
 - Drain the fuel from the tank in question and ventilate properly (recommended minimum 24 hours).
 - Insert in the filler neck an inverted “umbrella” or “spoon” to catch debris and drilled out rivet. Generously apply double sided tape on the “umbrella” or “spoon” surface to also catch small particles and to make sure they stick when removing.
 - Make sure the tank surface below the filler is absolutely dry to be able to spot and remove any debris potentially escaping the trap.
 - Cover the filler opening with tape before drilling
-

Aircraft Design Certification GmbH Reichensteinstr.48 69151 Neckargemünd		Electric System (IBBS / CAS Message / Fillerneck bonding)	Doc-Nr: ADxC-73-SB-037 Issue: A Date: 23.11.2023 Change Nr.: DC-104
Service Bulletin Bristell B23			

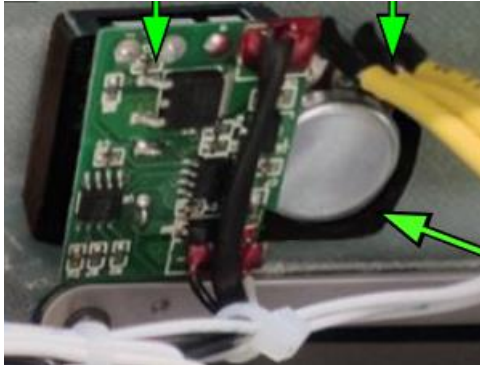


- Drill out ONE rivet (using 4.2mm drill). Approach the point of penetration carefully. Clean external debris before removing the tape from the filler opening. Note the drill is larger than the original rivet. It is recommended to perform this in one step (drill out and increase) in order to have most of the drill debris outside.
- Remove “umbrella” or “spoon” slowly and carefully and check you cached the drilled out head and other debris.
- Inspect lower inner tank surface. If needed clean using sticks prepared with adhesive or double sided tape.
WARNING: a standard vacuum cleaner cannot be used due to risk of fuel vapor explosion.
- Insert and mount new (larger) rivet.
- Repeat measurement
- Perform the same operation at least with a second rivet even if measurement is already acceptable
- If measurement is not acceptable repeat as often as needed.

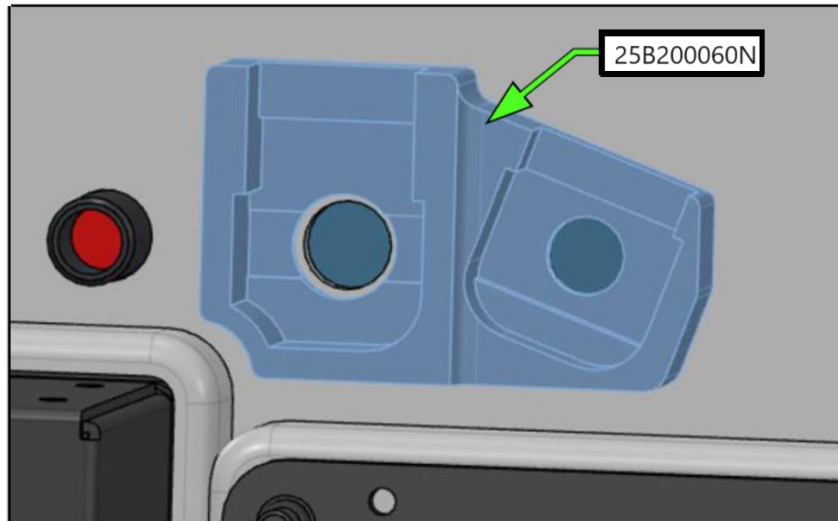
Aircraft Design Certification GmbH Reichensteinstr.48 69151 Neckargemünd		Electric System (IBBS / CAS Message / Fillerneck bonding)	Doc-Nr: ADxC-73-SB-037 Issue: A Date: 23.11.2023 Change Nr.: DC-104
Service Bulletin Bristell B23			

3.6 Dimmer Potentiometers securing

- Check if the light dimmer potentiometers on the instrument panel are loose.
- Torque properly if loose.
- Consider installing part 25B200060N to secure the potentiometers.
 - o Remove instrument panel cover.
 - o Remove the LED strip dimmer potentiometer and the multidimmer potentiometer from the instrument panel.

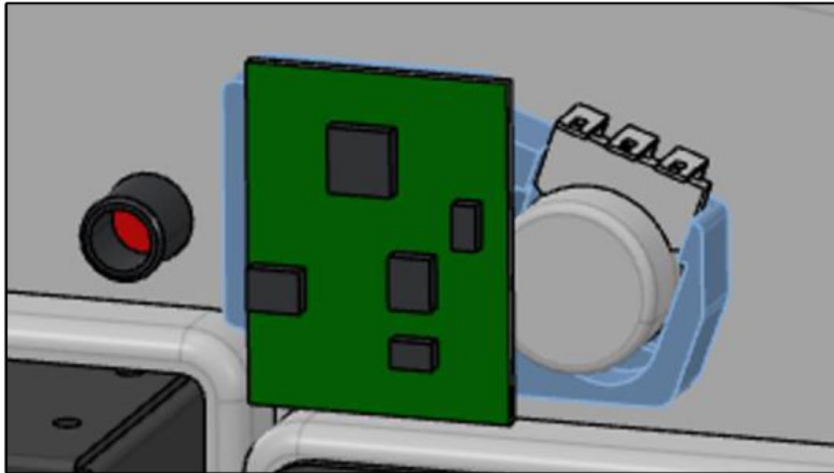


- o Sand the area where the potentiometer bed will be bonded and clean grease and dust free.
- o Bond the potentiometer bed on the sanded surface with polyurethane sealant Emfimastic PU 50 and make sure to align the holes properly.



- o Let the sealant harden at room temperature for at least 12 hours.

- Reinstall the LED strip dimmer potentiometer and the multidimmer potentiometer.

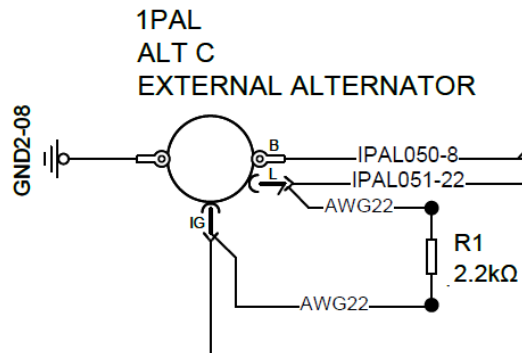


- Reinstall the instrument panel cover in reverse order.


3.7 R1 resistor replacement (optional)

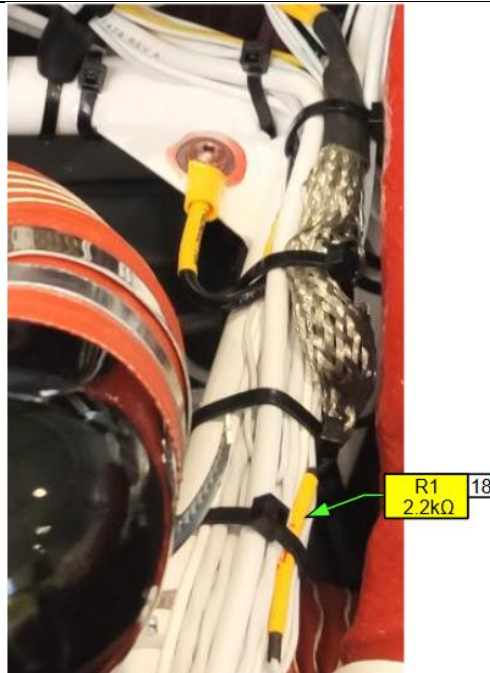
Exchange R1 resistor:

- Identify the existing R1 resistor at the ALT 2 or ALT C alternator, see example for ALT C.

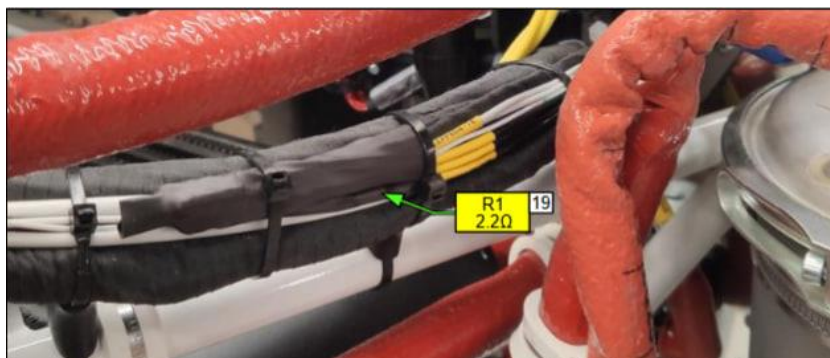


- Install the new resistor according to drawing 34B220000N (Rotax 912), 34B520000N (Rotax 915iS), 34B920000N (Rotax 915-G500), 34B620000N (Rotax 912-G500). Place the R1 resistor further away of the alternator and closer to the firewall of the aircraft.

Aircraft Design Certification GmbH Reichensteinstr.48 69151 Neckargemünd		Electric System (IBBS / CAS Message / Fillerneck bonding)	Doc-Nr: ADxC-73-SB-037 Issue: A Date: 23.11.2023 Change Nr.: DC-104
Service Bulletin Bristell B23			



Installation on B23




Installation on B23-915

- Apply markings to the wires as per drawing 34B220000N (Rotax 912), 34B520000N (Rotax 915iS), 34B920000N (Rotax 915-G500), 34B620000N (Rotax 912-G500).

3.8 Final

Perform a startup procedure with:

- Switch on „backup-battery“
- Confirm the backup battery (IBBS) supplies all connected consumers and that CAS messages are correct
 - o On B23 and B23-915 IBBS supplied elements are:
 - ADHARS
 - PFD
 - EIS
 - Glareshield light
 - o On B23-915-G500 and B23-912-G500 IBBS supplied elements are:
 - GTN650 (COM I / NAV I)
 - MFD

Aircraft Design Certification GmbH Reichensteinstr.48 69151 Neckargemünd		Electric System (IBBS / CAS Message / Fillerneck bonding)	Doc-Nr: ADxC-73-SB-037 Issue: A Date: 23.11.2023 Change Nr.: DC-104
Service Bulletin Bristell B23			

- EIS
- Glareshield light
- On B23 and B23-912-G500 CAS message (among others)
 - Amber „BACKUP BATT“ indicating that IBBS is not charged
 - Amber „ALT 2“ indicating that ALT 2 is not delivering
- On B23-915 and B23-915-G500 CAS message (among others)
 - Amber „BACKUP BATT“ indicating that IBBS is not charged
 - Amber „ALT C“ indicating that ALT C is not delivering
- Switch on (battery) master.
- Confirm amber „BACKUP BATT“ CAS message goes off (provided main battery is delivering >11Volt)
- Perform engine start up
- Confirm amber „ALT2“ respectively „ALT C“ CAS message goes off when connecting the external alternator to the grid (switch-breaker ON).
- On B23-915 and B23-915-G500
 - With engine running at 2500RPM
 - switch OFF GEN A/B
 - switch OFF (BATTERY) MASTER
 - ➔ in this condition the airframe is supplied only via ALT C
 - Confirm all consumers operate normal in this condition and while increasing engine RPM to maximum.
- Shut down aircraft according AFM

Make a log book entry and add note to aircraft CAW documentation that this Service bulletin has been incorporated.

4 Appendix

Relevant dwgs:

- 34B220204N A ALTERNATOR BONDING CABLE INSTALLATION
- 34B950106N A ALTERNATOR CAPACITOR INSTALLATION
- 34B220000N E ELECTRICAL POWER SYSTEM ROTAX 912
- 34B220200N E ELECTRICAL GROUNDING
- 34B520000N C ELECTRICAL POWER SYSTEM ROTAX 915iS
- 34B520200N C ELECTRICAL GROUNDING 915
- 34B620000N B ELECTRICAL POWER SYSTEM ROTAX 912-G500 DC-070
- 34B920000N B ELECTRICAL POWER SYSTEM ROTAX 915-G500 DC-058
- 34B240000N D ENGINE WIRING ASSEMBLY 912
- 34B540000N B ENGINE WIRING ASSEMBLY 915iS
- 34B200000N F AVIONICS INSTALLATION ASSY
- 34B500000N C AVIONICS INSTALLATION ASSY (915iS)