

# SERVICE BULLETIN



Service Bulletin No.: DA20-77-02, Rev.1

Date Issued: 7 May, 1999

Title: Electric Tachometer

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1. ATA Code: 7710

## PLANNING INFORMATION:

2. Effectivity: DA20-A1 aircraft.

3. General: This service bulletin addresses the modifications required to install an electric tachometer in place of the current mechanical tachometer. In order to complete this service bulletin, aircraft with hourmeters must have service bulletin No. DA20-79-01, 'Remote Mounting of Oil Pressure Transducer', incorporated.

**Note: This tachometer does not include an hour meter.**

4. Compliance: Optional.

5. Approval: Engineering data referenced or contained in this bulletin is approved as part of the type design.

6. Labor: Approximately 2.5 hours will be required to accomplish this service bulletin.

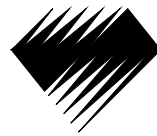
*This estimate is for direct labor performed by a technician and it does not include setup, planning, familiarization, cure time, part fabrication or tool acquisition.*

7.0 Material:	Part Number	Description	Qty
	230 880	O-ring	1
	810 620 or 22-7701-80-01	Cover Plate	1
	945 750	Lock Washer	1
	840 511	Allen screw	1
	20-3900-80-01	Blanking plate	1
	20-3910-01-09	Tachometer	1
	20-3910-04-29	Circuit Breaker Label	1
	MS20365-632	Lock Nut	2
	AN960C6	Flat Washer	4
	AN526C632R10	Screw	2
*	RPS 16-10/2.0-9	Heat Shrink Label	2
*	1-480318-0	Connector	1
*	36151	Ring Terminal	1
*	60618-1	Pins	2
*	60617-1	Sockets	5
*	M22759/34-22-9	Wire	1.6M
*	31886	Ring Terminal	1
*	RNF-100-1/8-WH	Heat Shrink	75mm

The above material is available by ordering material kit P/N DA20-77-02AMK0

For aircraft with 'Engine Activated Hour Meters' an additional Materials Kit will be required in addition to the the above kit. See next page.

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7.1 Material:	Part Number	Description	Qty
	020-305-P	Pressure switch	1
	A16600-2	T fitting	1
	AN960-10L	Washer	2
	AN3-5A	Bolt	1
	MS20365-1032	Nut	1
	MS21912WDG24	Clamp	1
*	36151	Ring Terminal	1
*	2-520184-2	Faston Connector	4
*	M22759/34-22-9	Wire	2.4M

The above material is available by ordering material kit P/N DA20-77-02BMK0. This kit is required when an engine activated hour meter is installed in addition to DA20-77-02AMK0.

\* Parts identified with an asterisk are assembled to each other within the kit.

Parts and materials required but not supplied in kit; Procure locally.

- Cable ties
- PRC 812
- Loctite 545

**8. Special Tools:** Calibrated hand held tachometer of equivalent.

**9. References:** DA20 Maintenance Manual Doc. # DA201.  
ROTAX 912 F Maintenance Manual, P/N 897-792

## 10. Accomplishment Instructions:

**10.1** Remove the upper and lower cowling.

**10.2** Disconnect the battery, negative lead first.

**10.3** Remove the instrument panel cover.

**10.4** Disconnect the tachometer cable at both ends.

**Note:** Instructions given for work to be carried out on the Rotax 912F are for order of operation only. Refer to applicable Rotax documentation and follow Rotax maintenance instructions for all work carried out on the engine.

**10.5** Refer to Rotax 912F maintenance manual, section 14, Rev. counter drive.

**10.6** Remove the allen screw and lock washer securing the rev counter housing.

**10.7** Remove the rev. counter housing, O-ring seal and rev. counter shaft.

**10.8** Install the new O-ring seal, cover plate, allen screw and lock washer.

**10.9** Remove the firewall shield and grommet that the tachometer cable passes through.

**10.10** Remove the mechanical tachometer from the instrument panel and retain the screws.

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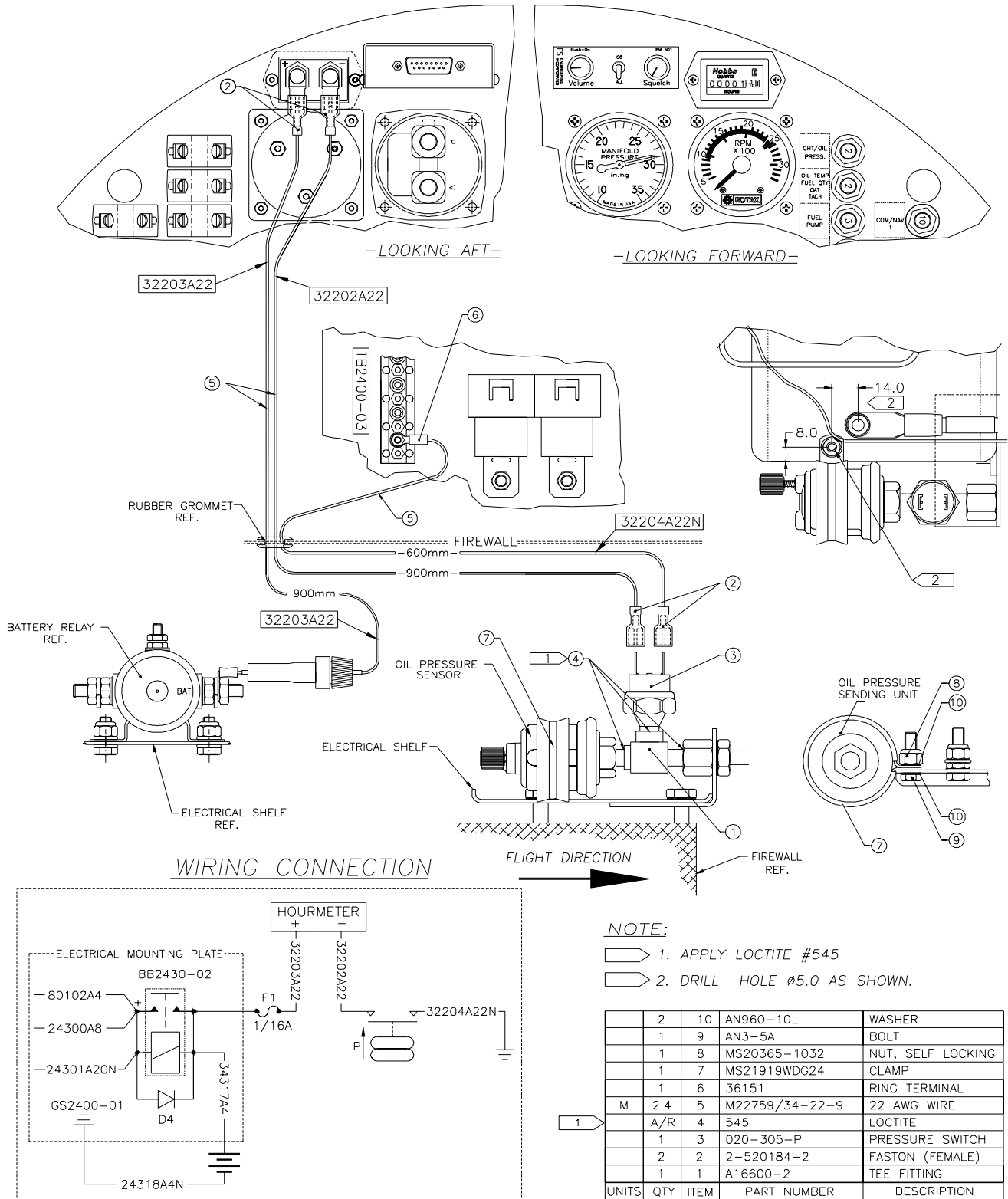


FIGURE 1

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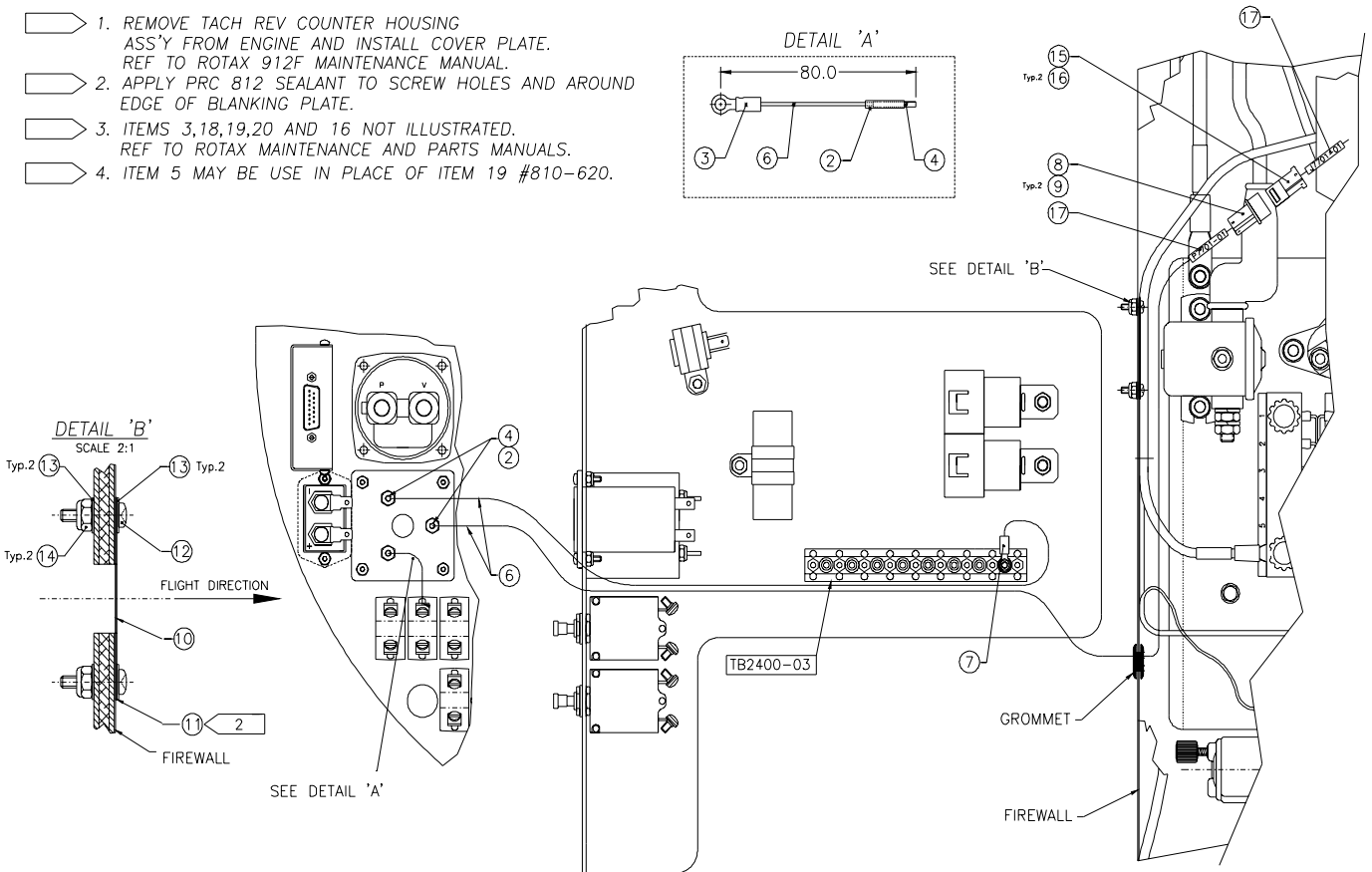
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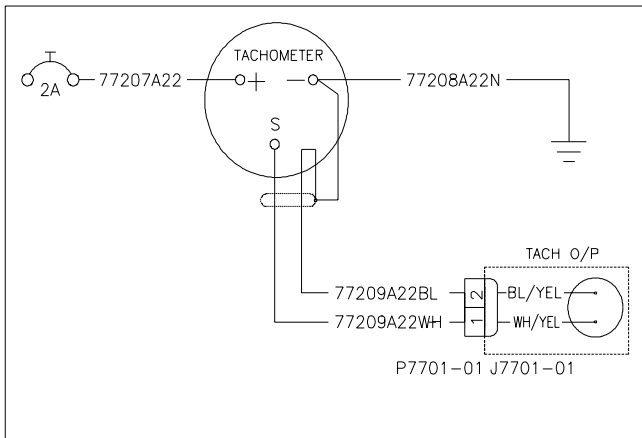
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**NOTE:**

1. REMOVE TACH REV COUNTER HOUSING ASS'Y FROM ENGINE AND INSTALL COVER PLATE. REF TO ROTAX 912F MAINTENANCE MANUAL.
2. APPLY PRC 812 SEALANT TO SCREW HOLES AND AROUND EDGE OF BLANKING PLATE.
3. ITEMS 3,18,19,20 AND 16 NOT ILLUSTRATED. REF TO ROTAX MAINTENANCE AND PARTS MANUALS.
4. ITEM 5 MAY BE USE IN PLACE OF ITEM 19 #810-620.



WIRING CONNECTION



3	1	20	945 750	LOCK WASHER
3	1	19	810 620	COVER PLATE
3	1	18	230 880	O-RING
	2	17	RPS 16-10/2.0-9	LABEL, HEAT SHRINK
3	1	16	945 511	ALLEN SCREW
	1	15	1-480318-0	2 PIN CONNECTOR
	2	14	MS20365-632	LOCKNUT
	4	13	AN960C6	FLAT WASHER
	2	12	AN526C632R10	SCREW, MACHINE TRUSS HEAD
2	A/R	11	PRC 812	SEALANT
	1	10	20-3900-80-01	BLANKING PLATE, FIREWALL
	2	9	60618-1	PINS
	1	8	1-480319-0	PLUG
	1	7	36151	RING TERMINAL
1.6M	6		M22759/34-22-9	22 AWG WIRE
	1	5	20-7701-80-01	COVER, PLATE
	5	4	60617-1	SOCKET
	1	3	31886	RING TERMINAL
	3	2	RNF-100-1/8-WH	HEAT SHRINK
	1	1	20-3910-01-09	TACHOMETER
QTY	ITEM		PART NUMBER	DESCRIPTION

FIGURE 2

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## 10. Accomplishment Instructions: Continued

- 10.11 Install the new tachometer into the panel using the same mounting screws removed in step 10.11.
- 10.12 Remove the label from the inboard row of circuit breakers.
- 10.13 Clean the instrument panel and apply the new placard.  
**Note:** Aircraft with engine activated hour meters have an electronics module located in the wire bundle near the hour meter. The electronics module is potted in an orange vinyl package.  
**Note:** For aircraft not equipped with engine activated hour meters or aircraft not equipped with hour meters instructions 10.15 to 10.29 do not apply.
- 10.14 For aircraft with an engine activated hour meter installed. Disconnect wire # 32202A22N from the electronics module. Cut the cable ties along the wire bundle to the ground terminal block. Disconnect wire # 32202A22N from the terminal block and discard.
- 10.15 Continue to cut cable ties along the route of the twisted shielded wire from the electronics module to the firewall.
- 10.16 Remove the firewall shield from around the instrument panel harness.
- 10.17 Continue to cut cable ties along the route of the twisted shielded wire up to the disconnect point at the engine trigger coil.
- 10.18 Disconnect the electrical connector and release the electronics module from the aircraft.
- 10.19 Disconnect the wire from the terminal of the oil pressure transducer.  
**CAUTION:** Take care not to contaminate the oil system.
- 10.20 Disconnect the oil line from the bulkhead fitting.
- 10.21 Remove the nut on the bulkhead fitting and release the fitting from the mounting bracket. Disconnect the oil pressure transducer from the bulkhead fitting.
- 10.22 Refer to figure 1, note 2. Locate and drill a 3/16" (5.0mm) hole in the electrical shelf.
- 10.23 Apply Loctite 545 to the male thread on the tee fitting and connect to the bulkhead fitting.
- 10.24 Apply Loctite 545 to the male thread on the oil pressure transducer and connect it to the tee fitting in line with the bulkhead fitting.
- 10.25 Apply Loctite 545 to the male thread on the oil pressure switch and connect to the tee fitting.
- 10.26 Re-attach the bulkhead fitting to the mounting bracket.
- 10.27 Orient the oil pressure switch so that it is vertical and use standard torque on all fittings. Install the support clamp for the oil pressure sender.

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## 10. Accomplishment Instructions: Continued

- 10.28 Attach wire # 32204A22N to one of the terminals on the pressure switch and wire # 32202A22 to the other terminal on the pressure switch.
- 10.29 Route the wires along the existing wire route through the firewall to the area of the hour meter.
- 10.30 Connect wire # 32202A22 to the (-) terminal of the hour meter.
- 10.31 Connect wire # 32204A22N to TB2400-03 as shown in figure 1.
- 10.32 Attach wire # 77207A22 to the load side of the circuit breaker marked 'Tach.' and attach the other end to the (+) terminal of the new tachometer.
- 10.33 Attach the white lead of wire # 77209A22 to the (S) terminal of the tachometer.
- 10.34 Attach the blue lead of wire # 77209A22 to the (-) terminal of the tachometer.
- 10.35 Route wire # 77209A22 and 77208A22N along the existing wire route toward the firewall. Connect wire # 77208A22N to terminal block TB 2400-03 and connect to the location shown in figure 2.
- 10.36 Route wire # 77209A22 through the firewall to the engine trigger coil connector shown in figure 1. Install the pin on the white wire to pin 1 of the supplied connector. Install the pin with the blue wire into pin 2 of the supplied connector. Install the connector labels, refer to the wiring schematic in figure 2.
- 10.37 For aircraft that do not have an engine activated hourmeter it will be necessary to attach sockets and a connector to the trigger coil wires. The trigger coil wires are stowed in the wire harness at the back of the engine. They can be identified as one blue wire and one white wire in a black sleeving.
- 10.38 Join the connectors.
- 10.39 Install new cables in place of the removed ones. Reinstall the firewall shield and seal with PRC 812.
- 10.40 Apply PRC 812 sealant to the edge of the stainless steel blanking plate and using the hardware supplied install over the hole in the fire wall where the old tachometer cable passed through.  
**Note:** The engine tachometer is not calibrated at this point
- 10.41 Run the engine to check for leaks.
- 10.42 Install the upper and lower cowlings.
- 10.43 Run the engine. Using the handheld tachometer as the reference adjust the speed of the engine until the propeller RPM is 2450.
- 10.44 Use a small screwdriver to adjust the calibration potentiometer so that the indication on the tachometer is equal to 2450.
- 10.45 Spot check the accuracy at 1000, 1500, 2000, and 2400 RPM, all readings should be within 50 RPM. Check that the indication is not under reading at 2400 RPM.

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## 10. Accomplishment Instructions: Continued

- 10.46 If necessary make minor adjustments to achieve the above tolerances.
- 10.47 Install the instrument panel cover.
- 10.48 Update the ' Airplane Flight Manual' weight and balance records.
- 10.49 Make the appropriate entry into the aircraft technical log.

## 11. Weight and Balance:

For aircraft which have the engine activated hour meter installation the total weight of the aircraft decreases by 383 grams. The effect on the Center of Gravity is negligible.

For aircraft without the engine activated hourmeter option installed the weight of the aircraft decreases by 438 grams. The effect on the Center of Gravity is negligible.

**12. Electrical Load Data:** Electrical load on the electrical system is increased by 25ma.

**13. Availability:** Contact Diamond Aircraft.

*To obtain satisfactory results, procedures specified in this Service Bulletin must be accomplished in accordance with accepted methods and current government regulations. Diamond Aircraft Industries Inc. cannot be responsible for the quality of work performed in accomplishing the requirements of this Service Bulletin. Diamond Aircraft reserves the right to void continued warranty coverage in the area affected by this Service Bulletin if it is not incorporated.*

*If you no longer own the aircraft to which this Service Bulletin applies, please forward it to the current owner and send the name of the current owner to Diamond Aircraft Industries Inc., at the address below.*

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