

WET TORQUE INDICATING SYSTEM - MAINTENANCE PRACTICES (PT6A-140)

1. General

- A. The procedures in this section include the torque indicator removal/installation and functional test. For the maintenance procedures applicable to the torque limiter and the torque transducer installed on the Pratt and Whitney PT6A-140 engine refer to the Chapter 73 Torque Limiter - Maintenance Practices section and Chapter 77 Torque Pressure Transducer - Maintenance Practices section, respectively, of the Pratt and Whitney Canada Maintenance Manual P/N 3075742 found in the Introduction List of Publications.

2. Torque Indicator Removal/Installation

- A. Remove the Torque Indicator (Refer to Figure 201).
- (1) Get access to the engine torque indicator.
 - (a) If necessary, remove the copilot seat. Refer to Flight Compartment Maintenance Practices.
 - (2) Disconnect the hose assembly lines from the indicator.
 - (3) Disconnect the electrical connector.
 - (4) While you hold the indicator in position, remove the screws that attach the torque indicator to the instrument panel.
 - (a) Make sure to keep the clips for installation.
 - (5) Remove the indicator from the instrument panel.
- B. Install the Torque Indicator (Refer to Figure 201).
- (1) While you hold the indicator in position, install the screws and clips that attach the indicator to the instrument panel.
 - (2) Connect the electrical connector.
 - (3) Connect the hose assembly lines to the indicator.
 - (4) Do a check of the indicator.
 - (a) Start the engine in accordance with the Model 208 Pilot's Operating Handbook.
 - (b) Monitor the indicator needle.
 - (c) If excessive fluctuation is present, bleed off the air in the system.
 - 1 Put a rag in position under the indicator pressure line and loosen the line to bleed the system.
 - (5) If necessary, install the copilot seat. Refer to Flight Compartment Maintenance Practices.

3. Oil Separator Breather Pad Removal/Installation

- A. Remove the Oil Separator Breather Pad (Refer to Figure 201).
- (1) Open the right upper engine cowling.
 - (2) Disconnect the vent line from the elbow.
 - (a) If necessary, remove or loosen the clamp enough to disconnect the line from the elbow.
 - (3) Remove the adapter from the oil separator.
 - (4) Use a wire with one end formed into a hook to remove the breather pads from the oil separator.
- B. Install the Oil Separator Breather Pad (Refer to Figure 201).
- (1) Insert the breather pads into the oil separator.
 - (2) Install the adapter into the oil separator and tighten.
 - (3) Connect the vent line from torque indicator to the elbow.
 - (a) If necessary, attach or tighten the clamp.
 - (4) Close the right upper engine cowling.

4. Torque Indicator Vent Line Leak Test

- A. Complete a Leak Test on the Torque Indicator Vent Line (Refer to Figure 201).
- (1) Open the left upper engine cowling.
 - (2) Disconnect the vent line from the elbow.
 - (a) If necessary, remove or loosen the clamp enough to disconnect the line from the elbow.

- (3) Connect the vacuum portion of the pitot-static test set to the vent line.
 - (a) Set the test set altimeter to zero.
- (4) Slowly apply vacuum.
 - (a) Make sure that the indicator reading does not start decreasing below zero.

NOTE: If this is the case, the connections to indicator are reversed and must be corrected.
 - (b) Continue to apply the vacuum until the altimeter on the test set shows 14,000 feet.
- (5) Stop the vacuum.
 - (a) Monitor the test altimeter or gage for one minute and make sure there is no loss of vacuum.
- (6) If there is a leak, disconnect the vent line from the indicator and cap it.
 - (a) Examine the test set plumbing and the vent line leakage and repair as necessary.

NOTE: With the vent line not connected to the indicator, you can use positive pressure and a bubble leak detector on the fittings to isolate the leaks.
 - (b) Examine the indicator for leaks.
 - 1 Connect the vacuum portion of pitot-static test set to the reference port fitting of the indicator.
 - a Set the test set altimeter to zero.
 - 2 Slowly apply vacuum.
 - 3 Continue to apply the vacuum until the altimeter on the test set shows 14,000 feet.
 - 4 Stop the vacuum.
 - a Monitor the test altimeter or gage for one minute and make sure there is no loss of vacuum.
 - 5 If there is a leak, examine the fitting for Teflon tape on the pipe threads and the correct torque.
 - a If the fitting is not the source of the leak, replace the indicator.
- (7) Connect the vent line to the elbow.
 - (a) If necessary, attach or tighten the clamp.
- (8) Close the left upper engine cowling.

5. Torque Indicator Pressure Line Leak Test

- A. Complete a Leak Test on the Torque Indicator Pressure Line (Refer to Figure 201).
 - (1) Open the right engine cowling.
 - (2) Disconnect the pressure line from the adapter.
 - (3) Connect the air pressure source to the pressure line.
 - (4) Apply 2 PSIG pressure and make sure that the torque indicator increases.

NOTE: If the torque indicator decreases, the lines to the torque indicator are reversed and must be corrected.
 - (5) Apply 40 PSIG pressure and shut off the pressure source. Record the data as follows:
 - (a) Let the system set for ten minutes to stabilize.
 - 1 Tap the test gage and record the exact test pressure (PSIG).
 - 2 Read the window of an altimeter set to zero altitude and record the ambient temperature (°F) and the true ambient pressure ("Hg).
 - (b) Let the system set for one hour.
 - 1 Record the test pressure, ambient temperature, and ambient pressure in the same manner as step (a) above.
 - (c) Correct for the ambient temperature and pressure differences as follows:
 - 1 Ambient Temperature Correction (PSIG) = Final Reading (°F) - Initial Reading (°F) x 0.1.
 - 2 Ambient Pressure Correction (PSIG) = Final Reading ("Hg) - Initial Reading ("Hg) x -0.49.
 - 3 Corrected Test Pressure = Initial Test Pressure + Ambient Temperature + Ambient Pressure Correction.
 - 4 Leakage = Corrected Test Pressure - Observed Final Test Pressure.

- (d) The leakage must not be more than 0.5 PSIG.

NOTE: The allowable leakage of 0.5 PSIG is because of the tolerances in the pressure gage and correction procedures. The goal is zero leakage.

1 If necessary, use a bubble leak detector solution on the fittings to find and repair any leaks.

- (e) If there is any doubt if a leak exists, then examine all the fittings with the bubble leak detector fluid.

- (6) Remove the pressure and disconnect the test equipment.
- (7) Connect the pressure line to the adapter.
- (8) Close the right engine cowling.

6. Torque Indicator Functional Test

- A. Complete a Functional Test of the Torque Indicator (Refer to Figure 201).

CAUTION: The incorrect connection will damage the indicator.

- (1) Connect the pressure source and gage (or deadweight tester) to the pressure port (marked P) of the indicator.
- (2) Let the reference port (marked V) of the indicator stay open to the atmosphere.
- (3) Apply pressures in the increasing direction. Refer to Table 201.
 - (a) Tap the indicator (to overcome the friction) and monitor the indicator reading tolerance.
- (4) Keep the pressure at the 3000 ft-lb point for one minute.
 - (a) Make sure there are no leaks.
- (5) Decrease the applied pressure to the indicator. Refer again to Table 201.
 - (a) Tap the indicator (to overcome the friction) and monitor the indicator reading tolerance.
- (6) Replace the indicator if it is not in accordance with the tolerance in Table 201 or if it leaks.
- (7) Apply 8.6 PSIA pressure (14,000-foot altimeter reading with the altimeter originally set to zero) to the reference port (marked V) of the indicator.
 - (a) Shut off the vacuum and make sure that no discernible leakage occurs in one minute.

Table 201. Scale Error

BENCH TEST INPUT PSI (NOTE 1 and NOTE 3)	IN-AIRPLANE INPUT PSI (NOTE 2 and NOTE 3) (REF)	TOLERANCE PSI (REF)	TORQUE (FT LBS) (NOTE 4)	TOLERANCE (FT LBS)
-0.22	0	+0.93 or -0.93	0	+50 or -50
9.11	9.33	+0.93 or -0.93	500	+50 or -50
18.44	18.66	+0.47 or -0.47	1000	+25 or -25
27.77	27.99	+0.47 or -0.47	1500	+25 or -25
37.10	37.31	+0.47 or -0.47	2000	+25 or -25
44.50	44.72	+0.47 or -0.47	2397	+25 or -25
46.43	46.64	+0.47 or -0.47	2500	+25 or -25
55.75	55.97	+0.47 or -0.47	3000	+25 or -25

NOTE 1: To be used to make sure that the indicator calibration is correct when the pressure source is at the same height as (or level with) the high pressure port on the indicator. For example during a bench test of the unit.

NOTE 2: To be used to make sure that the indicator calibration is correct when it is installed in the airplane. The indicator is installed in the airplane 6.3 inches (160 mm) higher than the engine transducer port. This causes a decrease in the pressure/torque reading of 12.0 ft lbs (0.22 psi) which must be compensated for in the torque indicator.

NOTE 3: The pressure-to-torque conversion rate is 53.6 ft lbs/psi.

NOTE 4: Tap the indicator before reading.

Figure 201 : Sheet 1 : Wet Torque Indicating System Installation

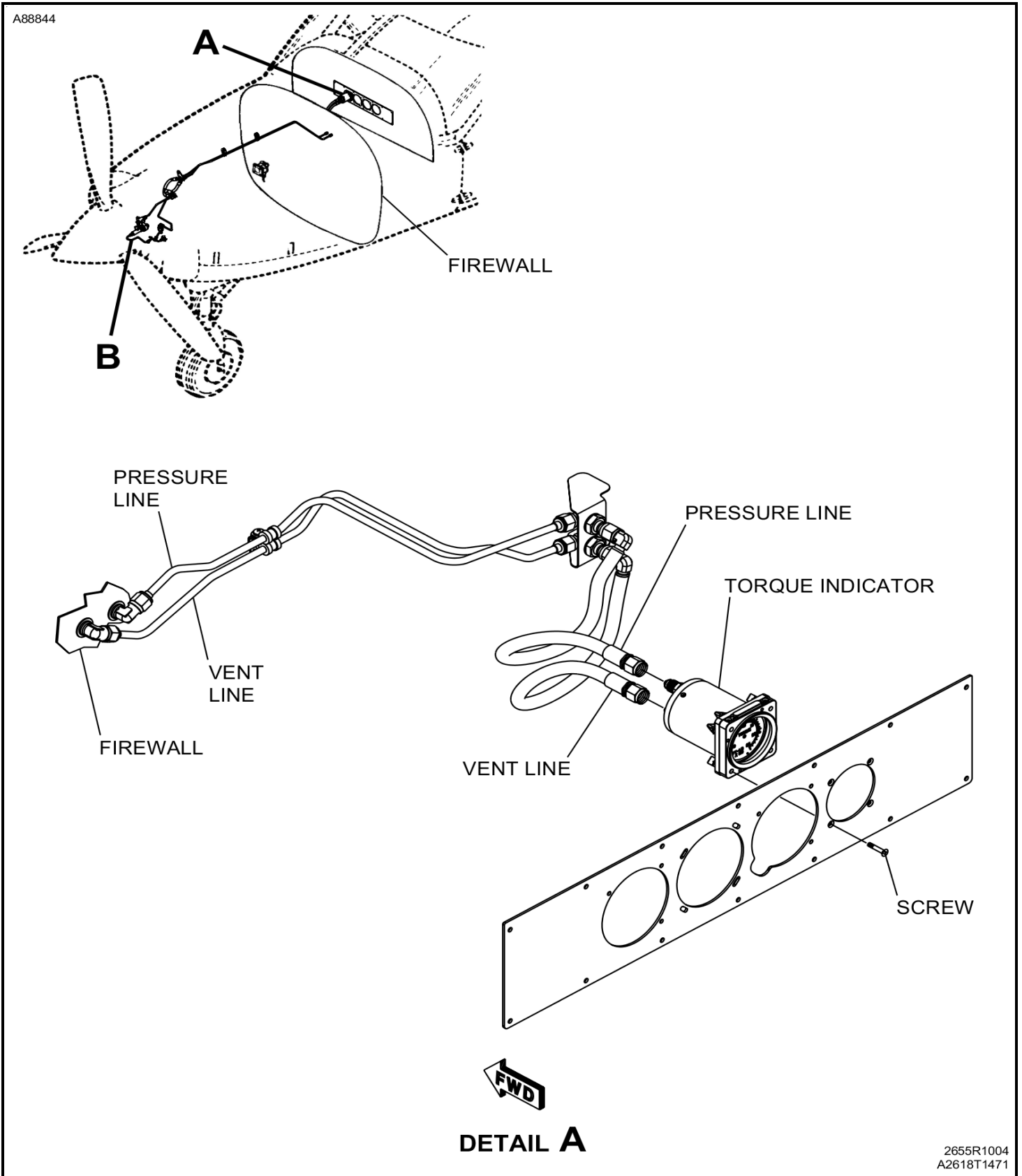
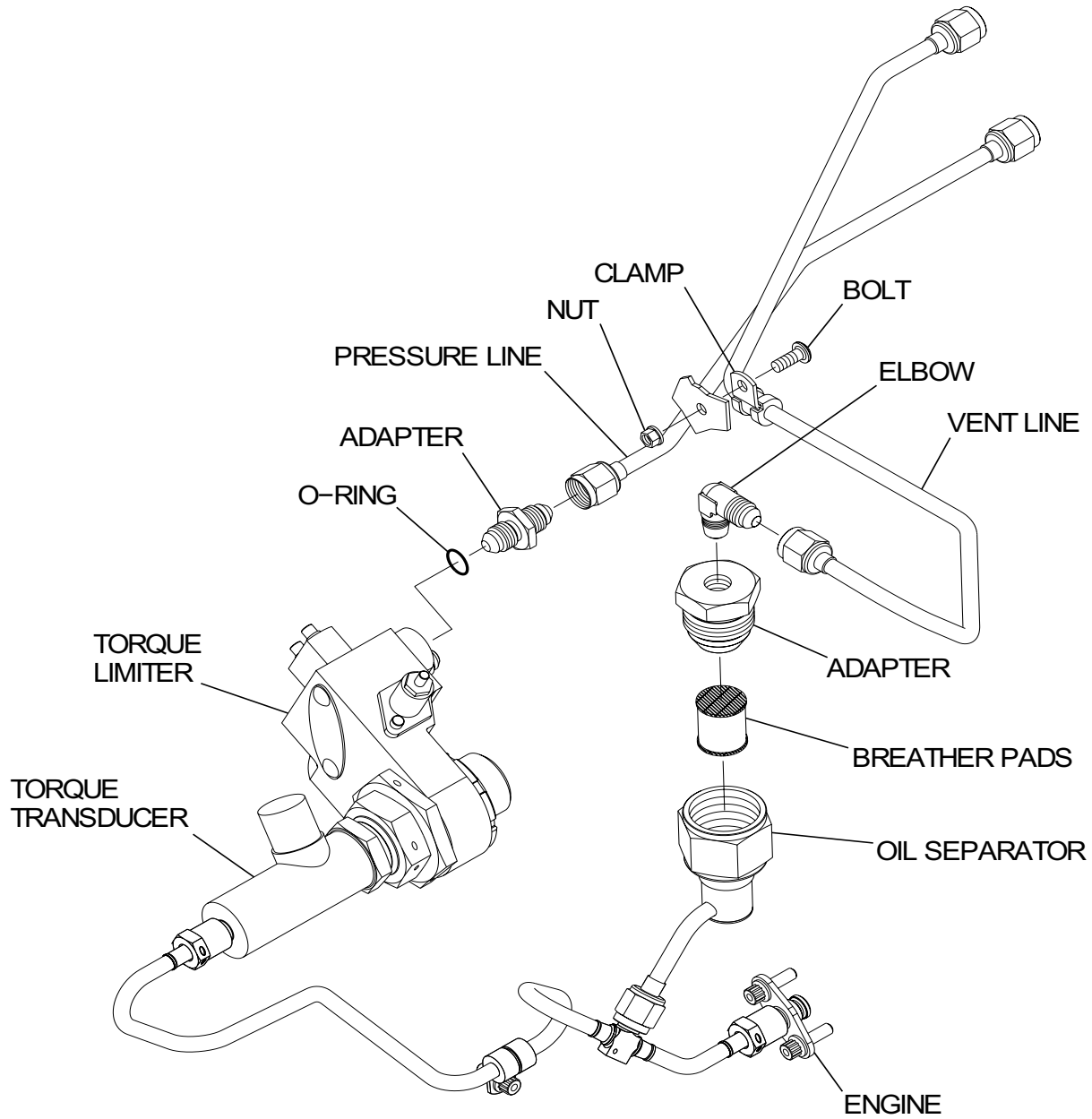


Figure 201 : Sheet 2 : Wet Torque Indicating System Installation

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DETAIL B

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