JIG Joint Inspection Group

Safety Bulletin

Bulletin No. 27 August 2009

Prevention of Misfuelling

Compliance with this Bulletin is required at all locations performing overwing fuelling operations. The precautions outlined below are applicable to locations that supply only Jet Fuel, or only Avgas, in addition to those locations which supply both grades.

This Bulletin is issued as an update to existing JIG procedures for overwing fuelling (JIG 1 - Into-Plane Fuelling Services, Section 6.5.5 and Appendix A4) and is intended to reflect current industry best practice in the prevention of misfuelling incidents. Misfuelling is the term used to describe when the incorrect grade of fuel is delivered to an aircraft. A misfuelling could result in an aircraft engine failure and this could be catastrophic if it occurs during flight. It is essential that procedures are in place to prevent this possibility.

Similar Aircraft

Certain aircraft are particularly vulnerable to misfuelling as they are similar looking but have different fuel requirements. Some examples are:

Requires Avgas		Requires Jet Fuel
Beechcraft Queen Air	looks like	Beechcraft King Air
Cessna 404 Titan	looks like	Cessna 441 Conquest

In some cases, manufacturers supply the same aircraft with either Avgas or Jet Fuel powered engines. One example is the Norman Britten Islander, illustrated below with the two different engine types:

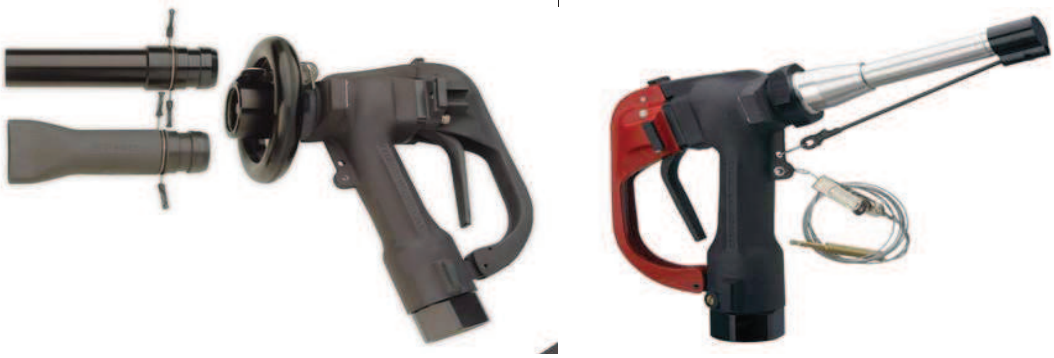
Grade Confirmation Procedures

Grade confirmation between the customer and into-plane service provider shall always take place. Where orders for fuel are received verbally in person or by telephone, the order, including the required grade, should be repeated to the customer and the quantity and grade recorded in writing.

Confirmation of the required grade shall always be made before fuelling commences by checking that the grade markings adjacent to the aircraft filling point and on the fuelling equipment are the same as the fuel grade requested. If no grade markings are present on the aircraft or if the grade markings are unclear, the pilot or responsible ground servicing personnel shall reconfirm the grade required by completing a Fuel Grade Confirmation Form. An example of a suitable form is shown on page 4 of this Bulletin.

Grade Selective Spouts

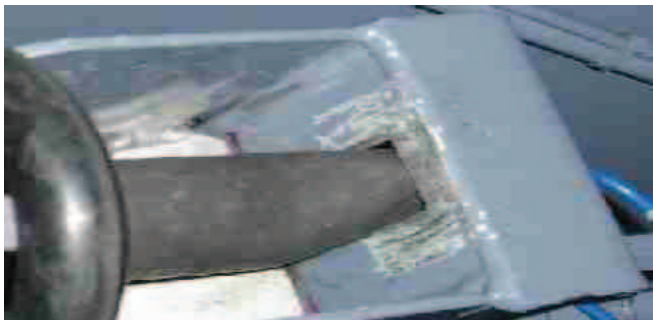
For Avgas overwing fuellings, a nozzle with a spout with a maximum external diameter of 49 mm shall be used.
For Jet Fuel overwing fuellings, a nozzle meeting the requirements of SAE AS 1582 with a spout with a major axis of at least 67mm should be used.



Certain Jet Fuel aircraft types have filling orifices that are too small to accept the 67mm Jet Fuel spout, necessitating the use of a smaller diameter spout. Where the use of a smaller non-selective Jet Fuel spout is necessary, additional controls are required.

Non-selective Jet Fuel spouts

At locations where it is occasionally necessary to use a small Jet Fuel spout it is strongly recommended that the overwing nozzle stowage shall be designed such that the interlock is disengaged only when the selective spout is fitted. This is to ensure that the selective spout is re-attached to the nozzle after any fuelling operation with the smaller spout.
An example of suitable interlock stowage is shown below:



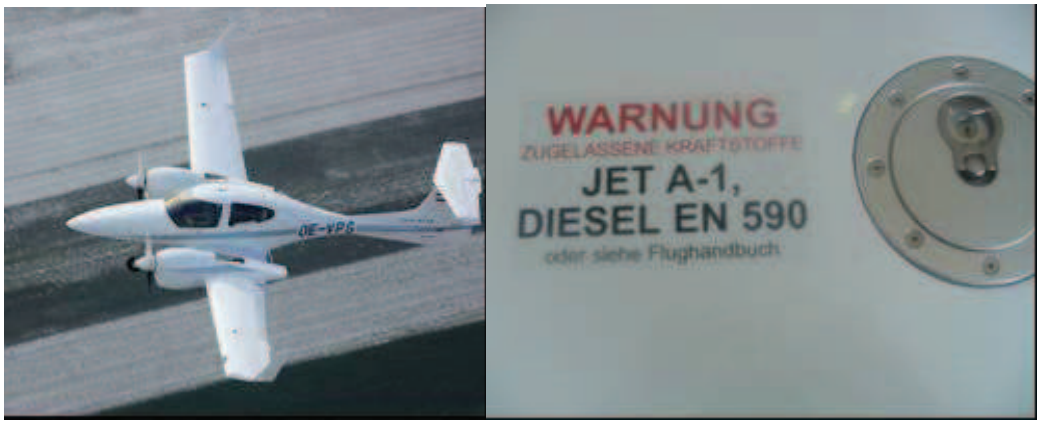
Additionally, the Fuel Grade Confirmation form should be signed by the fuelling operator to confirm that the grade selective spout was reattached to the nozzle after completion of fuelling.

At some locations, for example where there are many fuellings of light aircraft and helicopters with small filling orifices, the routine use of a small Jet Fuel spout may be authorised by local management. These are unlikely to be JIG Joint Venture locations, but if applicable, the agreement of the international participants would be required. At such locations the use of a Fuel Grade Confirmation Form is a requirement for all overwing fuellings.

Diesel Aircraft Engines

Several companies are now producing aircraft engines that are powered by Jet Fuel or Diesel. These engines are being installed on aircraft that typically had previously been fitted with engines that used Aviation Gasoline (Avgas).

These aircraft represent a serious risk of misfuelling by the delivery of Avgas to an engine designed for diesel fuel. Also, because some of these aircraft were originally designed for use with Avgas, many will have filling orifices that are too small for the normal 67mm Jet Fuel nozzle.



The use of a Fuel Grade Confirmation Form is required for all fuellings of these aircraft types.

Due to product quality compatibility concerns some oil companies do not support or endorse the supply of jet fuel to aircraft powered by diesel engines unless an indemnification agreement is signed by the pilot or owner. The Joint Venture should check with their participant companies.

Aviation Fuel Grades

Only aviation fuel grades (Jet Fuel and Aviation Gasoline) may be delivered to aircraft fuel systems (see Section 5.1 of JIG 1).

Although the engines fitted to certain aircraft types may be certified for use with Jet Fuel and Diesel, DIESEL FUEL MUST NOT be supplied to aircraft.

Motor Gasoline

Some light aircraft have grade markings allowing both Aviation Gasoline and Motor Gasoline to be used. For product quality reasons only Aviation Gasoline shall be supplied to aircraft by JIG Member Companies. The use of a Fuel Grade Confirmation Form is a requirement for all fuellings of aircraft with these grade markings.

FUEL GRADE CONFIRMATION FORM

This form shall be completed prior to fuelling any aircraft:

(a) where aircraft fuel grade markings are not clearly displayed or are missing;
(b) where aircraft requires Jet Fuel but a grade-selective spout is not used;
(c) where aircraft fuel grade markings show both Avgas and Motor Gasoline;
(d) where aircraft fuel grade markings show both Jet Fuel and Diesel

TO BE COMPLETED BY AIRLINE/AIRCRAFT AUTHORISED REPRESENTATIVE

To: ..... (Into-plane Service)

At: .....(Airport)

Aircraft Registration Number: ..... ☐ Tick if the aircraft has a diesel engine

The Aviation Fuel requirements for this aircraft are as follows:

	FUEL GRADE (*)	QUANTITY
Black JET FUEL (Aviation Turbine Kerosine)		
Red AVGAS (Aviation Gasoline)		

(*) Write appropriate grade in box, ie. Jet A-1, Jet A, AVGAS 100LL, AVGAS 100 etc.

I confirm that the fuel grade requested is suitable for use in the aircraft referred to above.

Name ..... Signature……

Position. ..... Date.....Time……...

TO BE COMPLETED BY FUELLING OPERATOR IF JET FUEL WAS DELIVERED BY NON-SELECTIVE SPOUT

I confirm that the grade-selective spout was reattached to the nozzle after completion of fuelling

Name ..... Signature……

Additional Precautions to Prevent Misfuelling Incidents

Misfuelling incidents occur infrequently. However, the need for effective preventative measures is due to:

(1) the potential consequences of supplying the wrong grade of fuel,
(2) the lack of a grade selective delivery nozzle that can always be used, and
(3) additional concerns related to fuelling aircraft with compression ignition (Diesel) engines including those which have been converted from Avgas to Diesel engines

Some additional measures, recommended to enforce the procedures for grade confirmation are outlined below.

A “no decal – no fuel” policy that requires the aircraft pilot to attach decals meeting API/EI 1597 requirements (provided by the fuelling operator) if the aircraft fuel grade markings are missing or unclear

A physical check of aircraft decals against a coloured grade decal tag kept in the pocket of the operator

Adonised handles (red for Avgas) on overwing nozzles (see photo on page 2)

Fuelling equipment to be grade marked in accordance with API/EI 1542 using decals that are prominently displayed and are clearly visible from a distance of 20 metres.

Coloured grade decal sleeves on overwing delivery hoses and coloured grade decal tags on overwing nozzle bonding cables