

Olympus 201 SeriesSection 2E.C.U. Description1. Nose Fairing

Surrounds the oil tank and is of double skin construction, the space between the skins allows a passage for engine anti-icing air. Space between studs ensures that fairing will fit in one position only. Slots around the mating faces allow the anti-icing air to exhaust from the nose fairing into the leading edge of the six-hollow vanes of the intake casing.

2. Air Intake Casing.

The light alloy air intake is bolted to the low-pressure compressor casing and has an integral inner casing supported by six vanes. The oil tank is attached to the centre casing. Housed in the inner casing is the oil separator. The rear diaphragm supports the L.P. Compressor front bearing and the front diaphragm supports the oil separator front bearing. A ring of hollow compressor entry guide blades is located at the rear of the intake casing; these blades are fixed, as variable incidence blades are unnecessary with the two spool compressor system. A circumferential collector ring located around the outer casing distributes hot air to the entry guide blades. The six vanes are numbered clockwise when viewed from the rear and are used for the following services.

Vane 1 - Lifting eye.

Vane 2 - Oil feed to L.P. Compressor front bearing.

Vane 3 - Supply from tank to pump. Scavange return to tank.

Vane 4 - Scavenge oil from L.P. Compressor front bearing.
Oil tank overflow pipe.
(Vent from L.P. Compressor front bearing seal).
(Vent from oil separator).

Vane 5 - Oil tank contents indicator shaft.

Vane 6 - Oil tank pressurising valve.

A recent modification to this engine has been to delete the two "Ram Air Pitot Locations" on vanes nos. 2 and 6 and provide a heated nozzle immediately in front of vane No. 4.

3. Low pressure compressor Rotor and casing.

The five stage axial flow compressor rotor is driven by the second stage turbine wheel. The oil separator is driven from the front of the compressor, the fuel pump and engine tachometer being driven from the rear. The alloy casing is in two parts secured by bolts along the centre line. The engine front mounting support is attached to the top of the casing and steadies the front end of the engine by means of a single adjustable link. A mounting bracket on the starboard side lower half casing is the location for the Constant Speed Drive Unit and Alternator. A fourway connection is tapped into the rear of the L.P. lower half casing. A transportation and test bed location point is located on the lower half casing.

4. Front Bulkhead and Seales.

/Comprise top

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Comprises top and bottom units, attached to the L.P. Compressor Casing, forming the dividing wall between Zone 1 and 2A of the engine installation. A seal, located around the bulkhead, is kept to a value of 5 p.s.i. by a valve. Two covers are provided for the Flow meter and the Constant Speed Drive Unit. Passing through the bulkhead are Air, Fuel and oil and hydraulic pipelines, the throttle control rod and various breeze plug connections.

5. Intermediate Casing

Situated between both compressors and contains both L.P. exit guide blades and H.P. inlet guide blades. The centre casing is connected to the outer by eight hollow vanes. The rear L.P. Compressor and the front H.P. Compressor bearings are accommodated within the front and rear walls of the casing. Mounting faces for the auxiliaries are arranged around the outer casing. Vanes of the casing are used as follows.

Vane 1 - Banjo connection for pressurising.

- (a) C.S.D.U. oil tank
- (b) Front and rear bulkhead seals.

Vane 2 - Blank.

Vane 3 - Oil feed to L.P. Compressor front bearing.

Vane 4 - Drive to Constant Speed Drive Unit and starter.

Vane 5 - Drive to oil pump and auxiliaries oil Drain to sump.

Vane 6 - Front. - L.P. Fuel pump drive and hand turning gear.
Rear - H.P. Fuel pump drive and hand turning gear.

Vane 7 - Blank

Vane 8 - Blank

6. High Pressure Compressor Rotor and Casing.

Made from steel the rotor has seven stages. Drives from this compressor are taken for the H.P. Driven fuel pump, main oil pressure pump, five scavenge pumps constant speed drive unit, hydraulic pump (Nos. 1, 2 and 3 engines only). In addition the air starter is connected to this compressor. Inside the compressor are assembled concentrically an inner oil tube and an outer air transport tube. The casing is divided into two halves along the centre line. An external pipe is connected to the third stage of the compressor casing upper half and is used in the engine air system.

7. Delivery Casing.

The inner and outer steel casings are linked together by eight hollow vanes. Two mounting trunnions are bolted to the outer casing. The support for the H.P. Compressor rear bearing and the coupling chamber unit is located on the front of the inner casing flange, the coupling access hole is blanked by a cover plate with special seals. Mounted on the rear of the inner casing is the H.P. Turbine rear bearing support unit. External connections are:-

- (i) P1/P3 Switch tapping.
- (ii) Oil cooler and fuel filter attachments.
- (iii) Unit fuel system brackets.
- (iv) Duplex burners.

The hollow vanes are utilised as follows:-

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- Vane 1 Blanked
- Vane 2 A/C Hot air services
- Vane 3 Fuel tank pressurising and inducer valve
- Vane 4 Oil feed and oil drain pipes
- Vane 5 Vent to main engine breather.
- Vane 6 Engine anti-icing air outlet
- Vane 7 Fuel heater air outlet
- Vane 8 Blanked

8. Turbine Couplings.

The inner coupling drives the L.P. compressor and is situated within the H.P. coupling and rotates independantly on the intershaft roller bearing. An oil supply to this bearing is maintained by providing an oil feed tube within the L.P. Turbine shaft.

9. Rear Bulkhead.

This bulkhead forms the dividing wall between zone 2a and 2b air seal inflated 5 p.s.i. by the L.P. Compressor, completes the efficient sealing between the zones. Attached to the front face is the starter exhaust pipe and the throttle rod rear bearing while on the rear face are the two Breeze plug connections for the zone 2a fire detectors. Pipelines for the following services pass through this bulkhead.

- (i) H.P. 3rd stage air.
- (ii) Pressure oil to L.P. Turbine bearing.
- (iii) Scavenge oil from L.P. Turbine bearing.
- (iv) Drain and Dump valve fuel.
- (v) Zone 2b inducer.

10; Bearings.

There are seven main bearings located in the following positions.

- No.1. L.P. Compressor front bearing (ROLLER) positioned at the rear of the air intake casing.
- No.2. L.P. Compressor rear bearing (SINGLE BALL) positioned in the front wall of the intermediate casing.
- No.3. L.P. Compressor front bearing (ROLLER) positioned in the intermediate casing rear diaphragm.
- No.4. L.P. Compressor rear bearing (DOUBLE BALL) positioned in the front of the coupling chamber.
- No.5. Intershaft bearing (ROLLER) positioned between the L.P. and H.P. Couplings.
- No.7. H.P. Turbine rear bearing (ROLLER) positioned at the rear of the turbine inner drum.
- No.8. L.P. Turbine rear bearing (ROLLER) positioned in the exhaust annulus diaphragm.

11. Turbine Mounting.

The outer casing encloses the flame tubes, turbine entry duct, H.P. Turbine stators and H.P. Turbine casing. Three-mountings for the two igniter plugs and the turbine drain connection are provided in the bottom half casing. A heat shield is fitted around this casing.

Eight flame tubes, nos. 4 and 6 taking the igniter plugs are fitted. The interconnectors only facilitate instantaneous light up. The turbine entry duct,

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housed in the rear of the combustion chamber outer casing is made of sheet metal and supports the downstream end of the eight flame tubes. Stator segments are inserted into the rear off the entry duct.

The H.P. turbine support housing is normally referred to as the turbine inner drum. The rear end accommodates the H.P. turbine rear bearing and housing. An oil jet and filter assembly provides lubrication for the bearing.

12. Turbine Assembly.

The H.P. Turbine rotor disc is bolted to the rotor shaft. Immediately in front of these bolts are the bearing and its front and rear seals. Note that the bearing is the only one that is pressurised on both sides.

The L.P. Turbine shaft passes through the bore of the H.P. Turbine shaft. A seal at its forward end prevents hot air from the turbine passing between the shafts.

13. Exhaust Annulus and Cone.

Located on rear face of the L.P. Turbine casing. Eight hollow vanes separate the inner and outer rings. A diaphragm at the front end of the inner ring supports the L.P. Turbine rear bearing while at the rear the inner exhaust cone is attached. Three of the eight vanes are utilised as follows:-

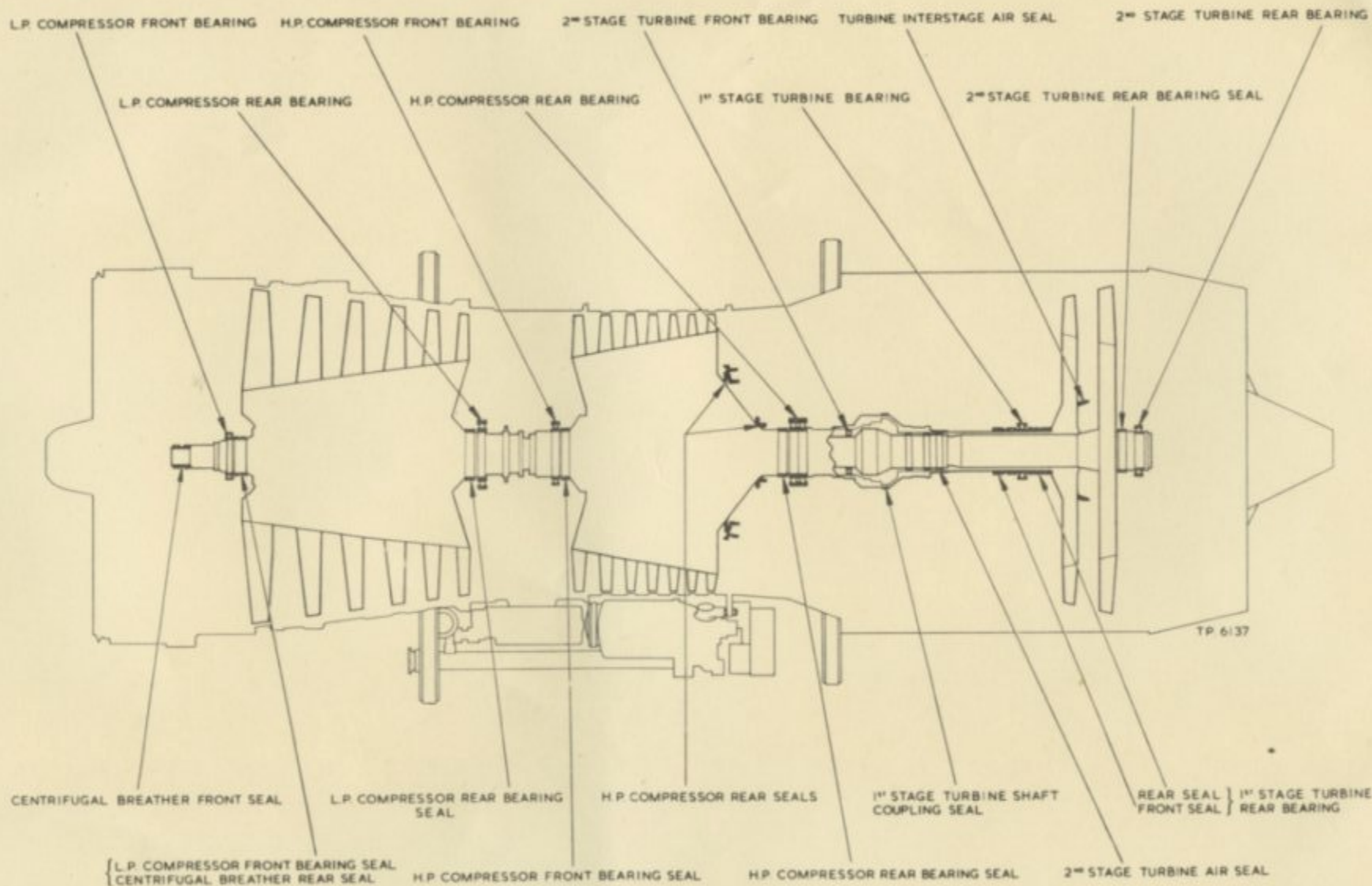
Vane 1 - 3rd stage H.P. compressor air pipe.

Vane 4 - Oil feed pipe.

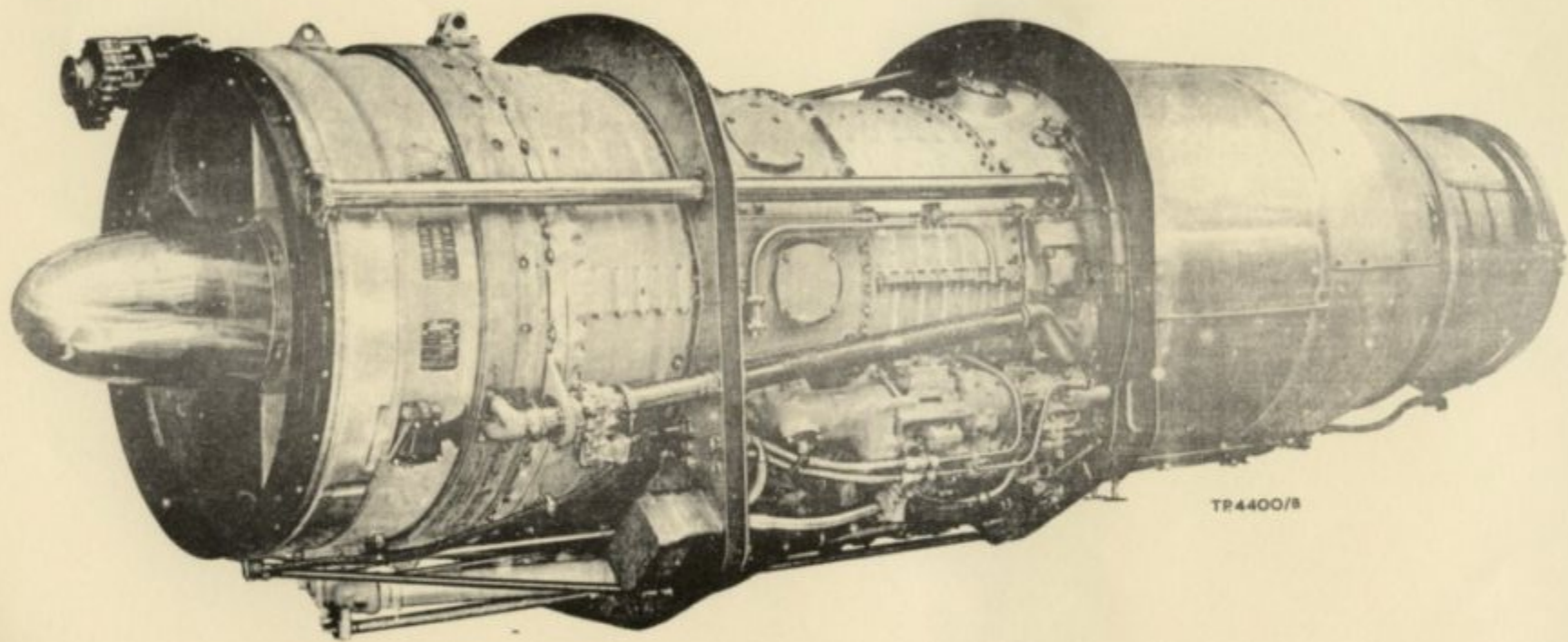
Vane 5 - Oil drain pipe.

The outer exhaust cone is bolted to the exhaust annulus outer ring. It has front and rear bellows units designed to permit a limited misalignment between engine and jet pipe. The jet pipe is attached by means of a canacle clamp. Drainage collectors are provided at the bottom of the bellow seals to drain away any fuel that may seep through the attachment joints.

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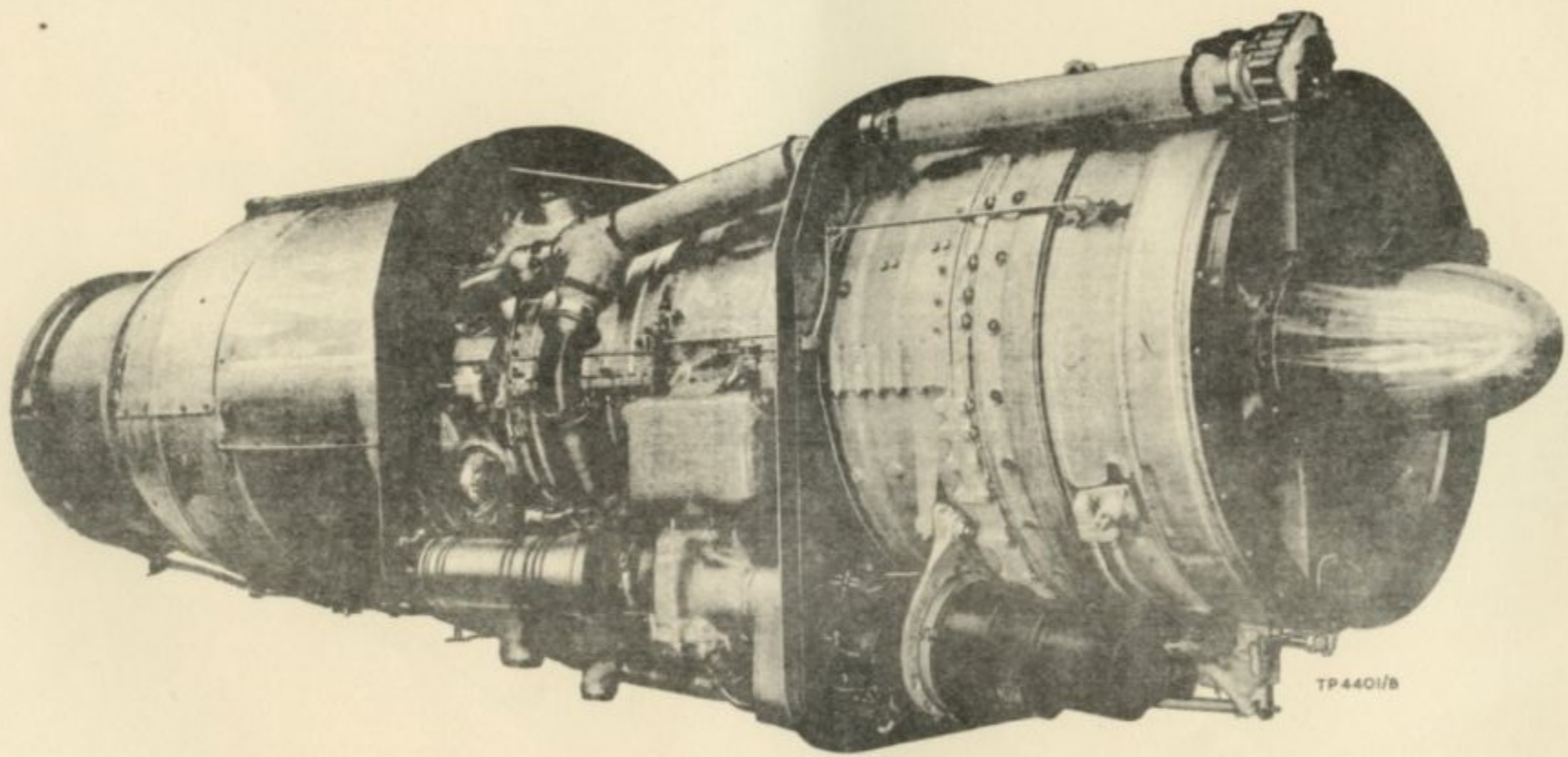


BEARINGS AND AIR SEALS



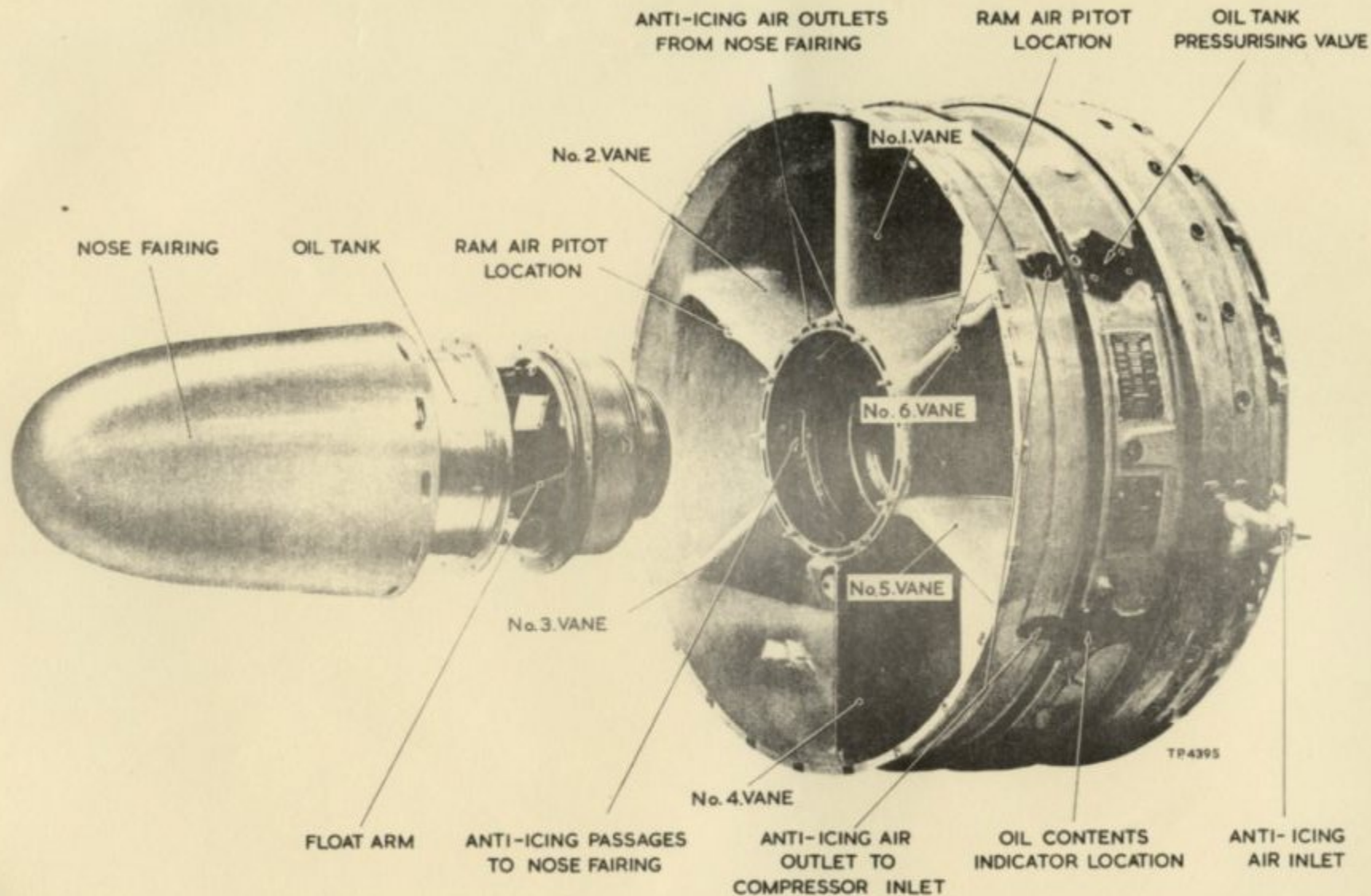
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OLYMPUS 201 3/4 PORT VIEW

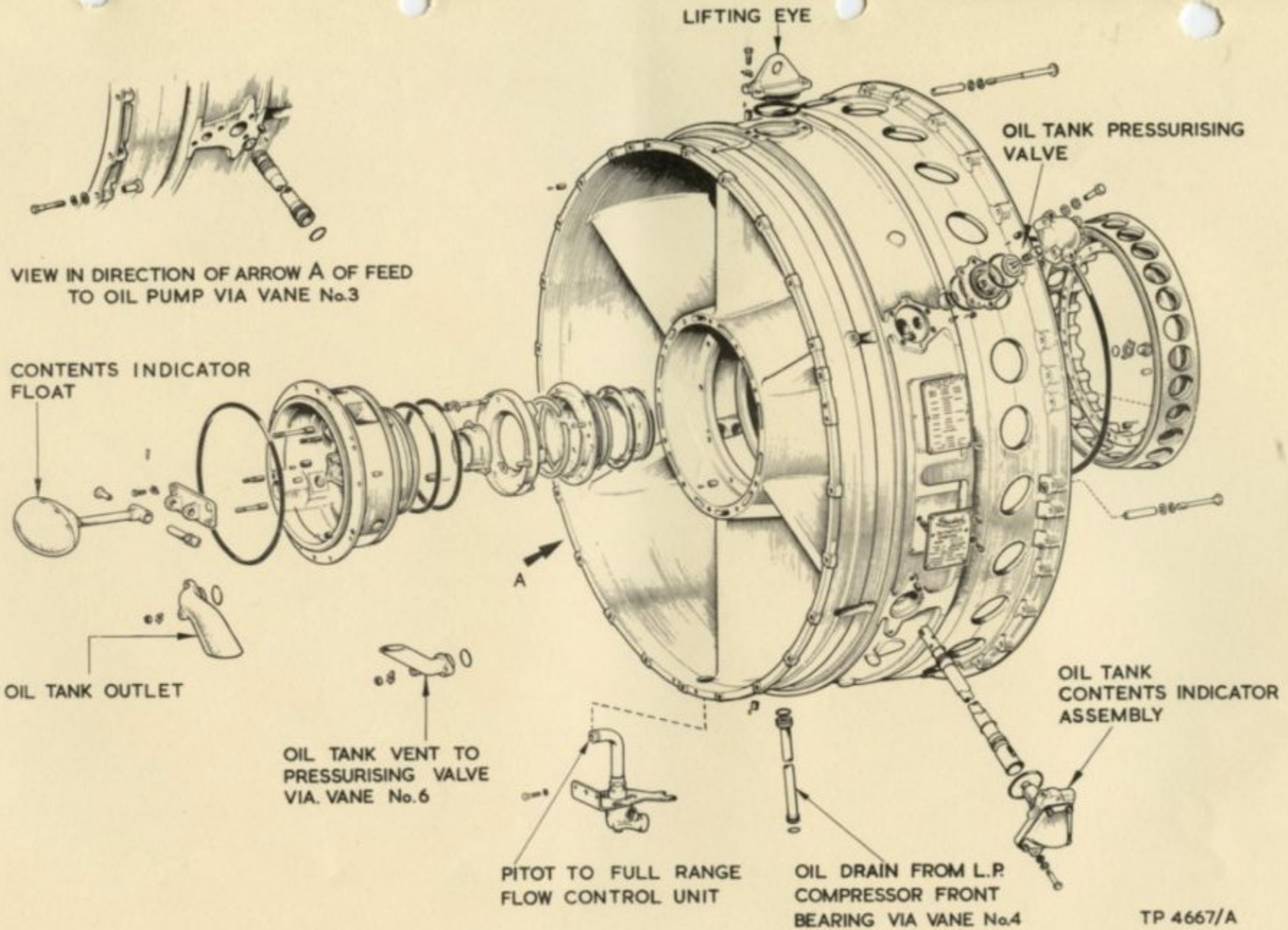


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OLYMPUS 201 ¾ STARBOARD VIEW

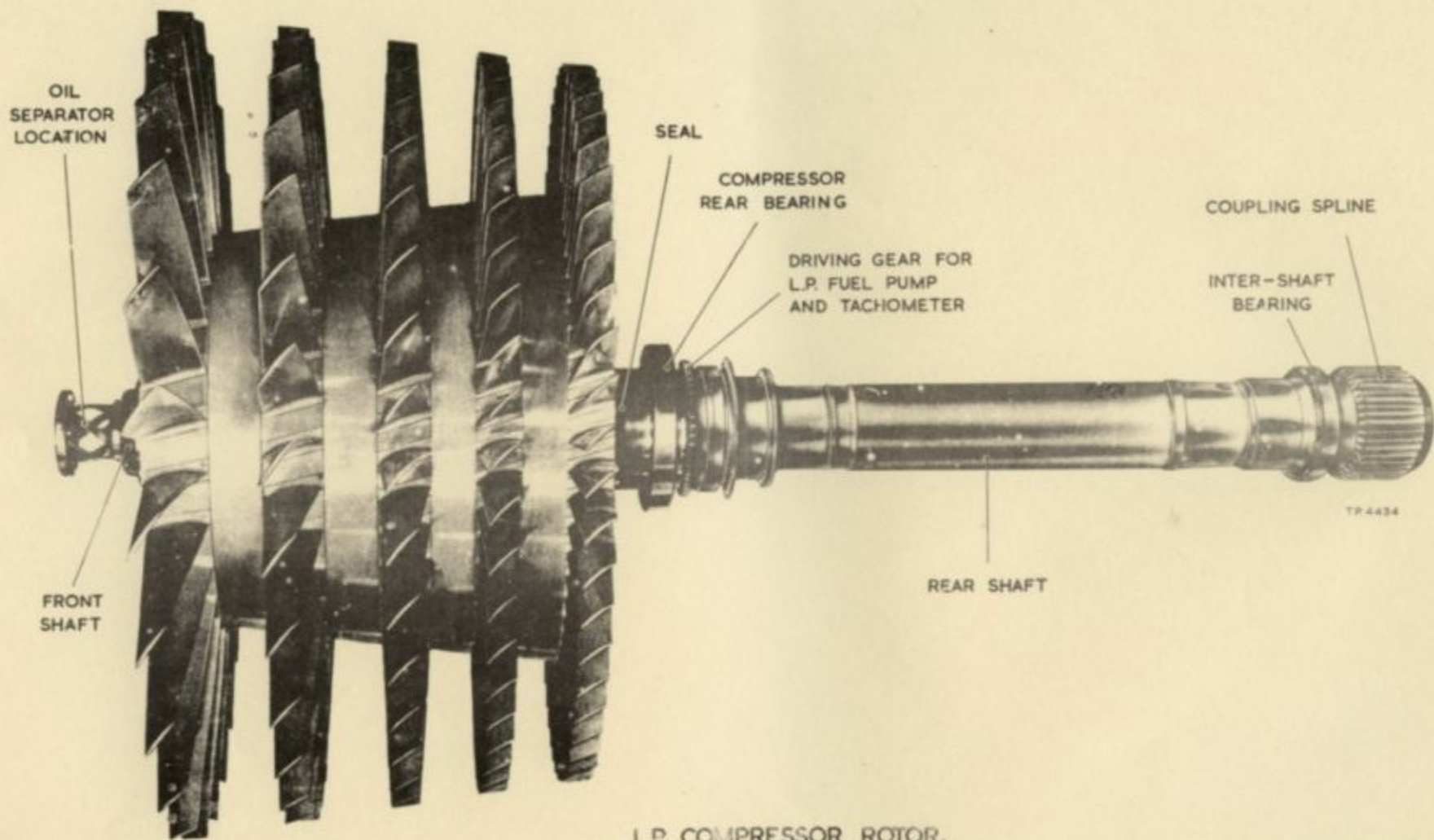


NOSE CONE AND INTAKE CASING



TP 4667/A

AIR INTAKE CASING
OLYMPUS 201



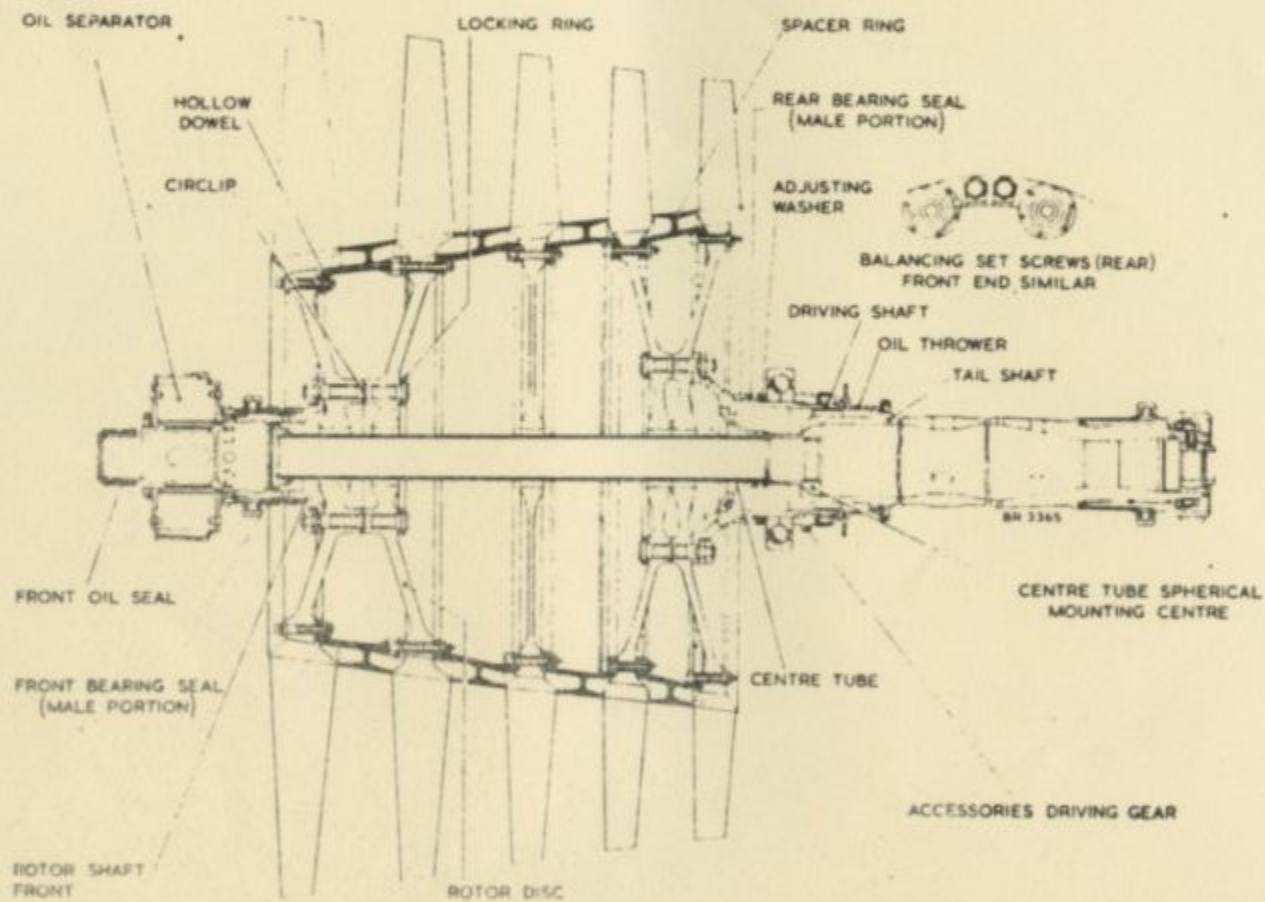
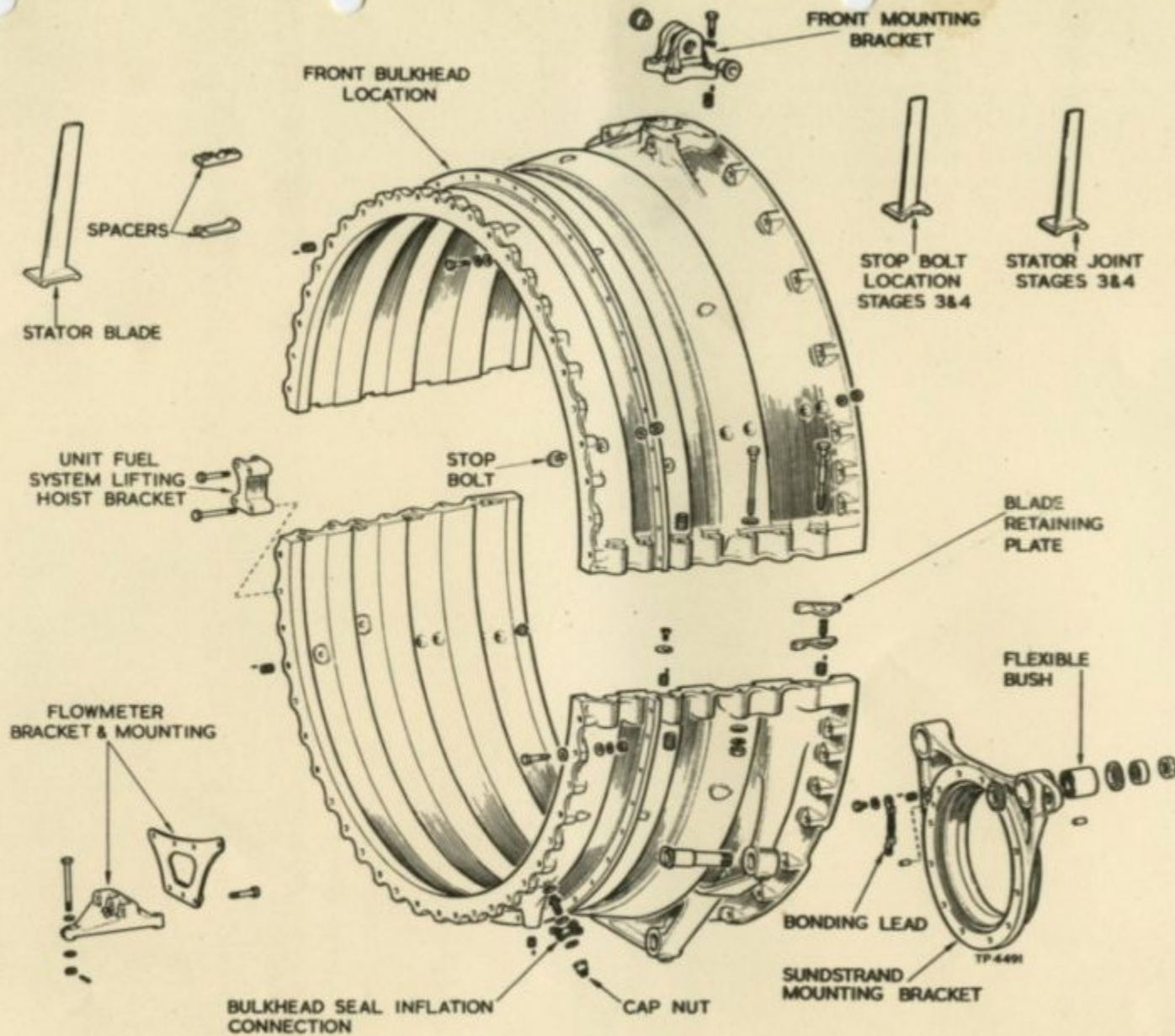


Fig. 15. L.P. compressor rotor—general arrangement



COMPRESSOR CASING $\frac{3}{4}$ REAR VIEW

A OIL PIPE LOCATIONS
B COOLING AIR DUCTS

HOT AIR SUPPLY
TO AIRCRAFT AND
ENGINE STARTING AIR

OIL TO L.P. COMPRESSOR
FRONT BEARING

CONSTANT SPEED
DRIVE UNIT

DRAIN

BLANKING PLATE
HYDRAULIC PUMP
(NOT FITTED)

FUEL INLET

HYDRAULIC PUMP
CONNECTION OR BLANK

BULKHEAD UNIT
TOP

FUEL HEATER PIPE

BLOW-OFF VALVE

ENGINE ANTI-ICING
AIR DUCT

SEAL ASSY.
(INFLATOR STEM
EXHAUST STEM)

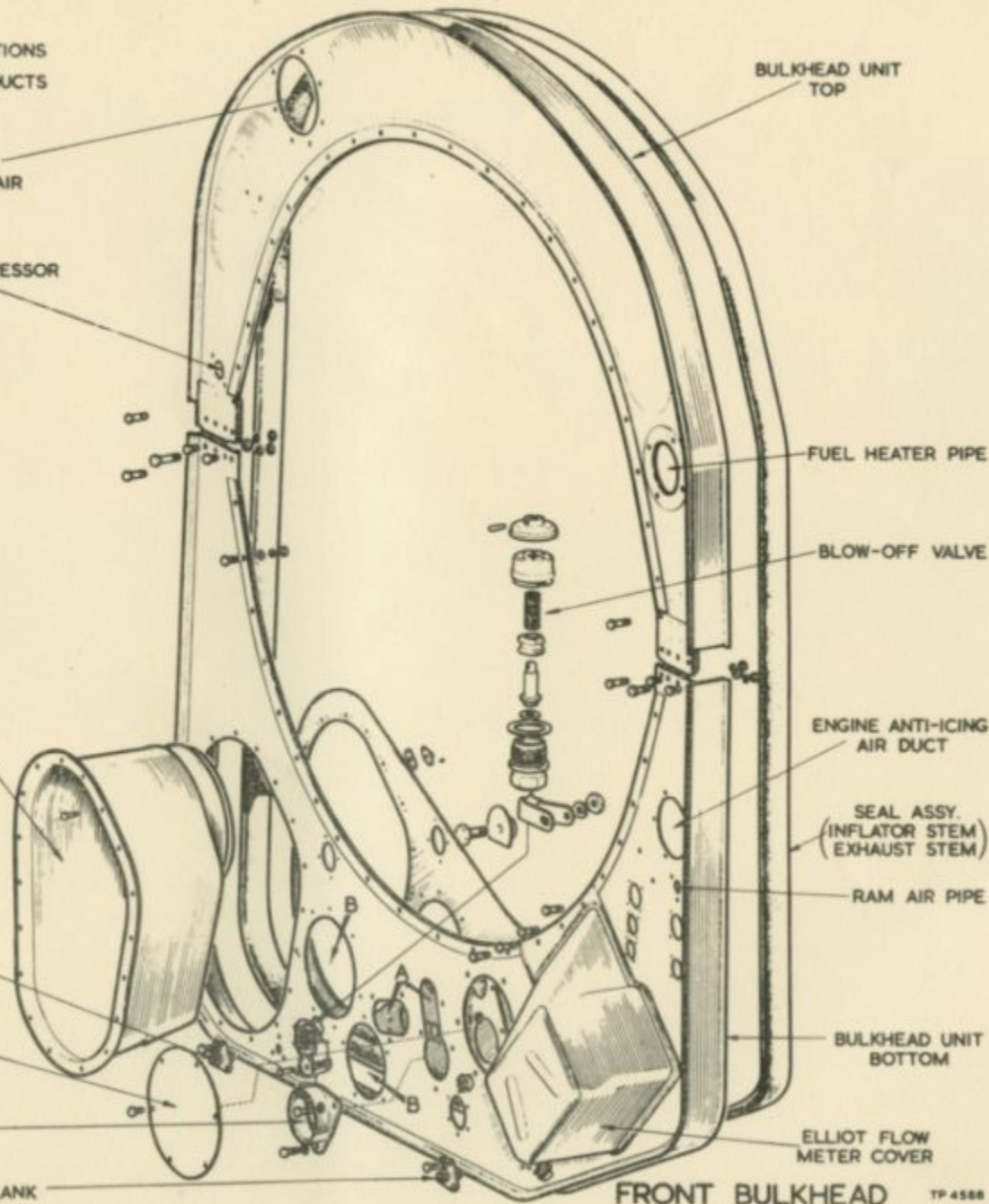
RAM AIR PIPE

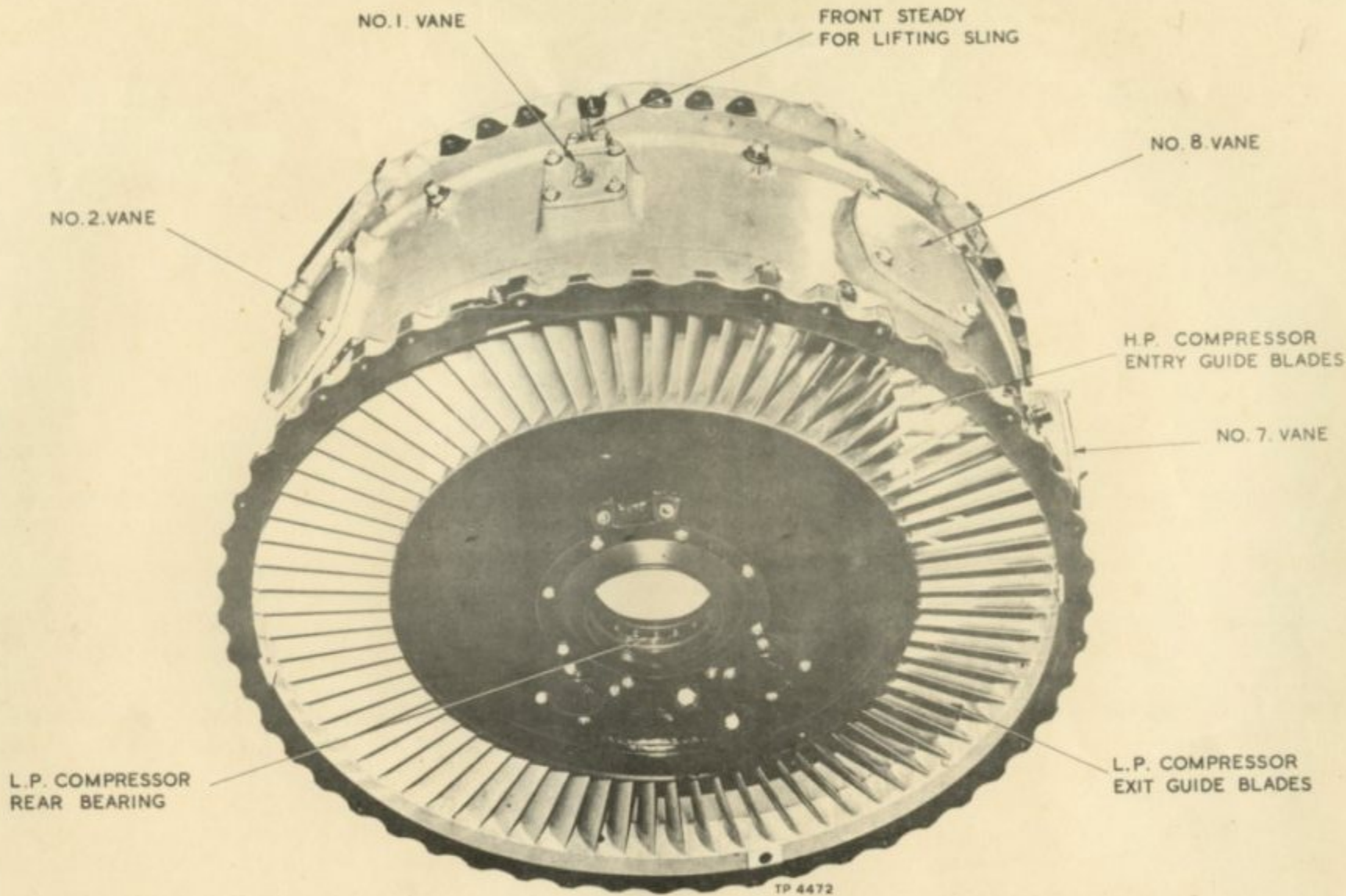
BULKHEAD UNIT
BOTTOM

ELLIOT FLOW
METER COVER

FRONT BULKHEAD

TP 4588





INTERMEDIATE CASING

Job No 1920
WAD/30/v2P

A OIL PIPE LOCATIONS
B COOLING AIR DUCTS

HOT AIR SUPPLY
TO AIRCRAFT AND
ENGINE STARTING AIR

OIL TO L.P. COMPRESSOR
FRONT BEARING

CONSTANT SPEED
DRIVE UNIT

DRAIN

BLANKING PLATE
HYDRAULIC PUMP
(NOT FITTED)

FUEL INLET

HYDRAULIC PUMP
CONNECTION OR BLANK

BULKHEAD UNIT
TOP

FUEL HEATER PIPE

BLOW-OFF VALVE

ENGINE ANTI-ICING
AIR DUCT

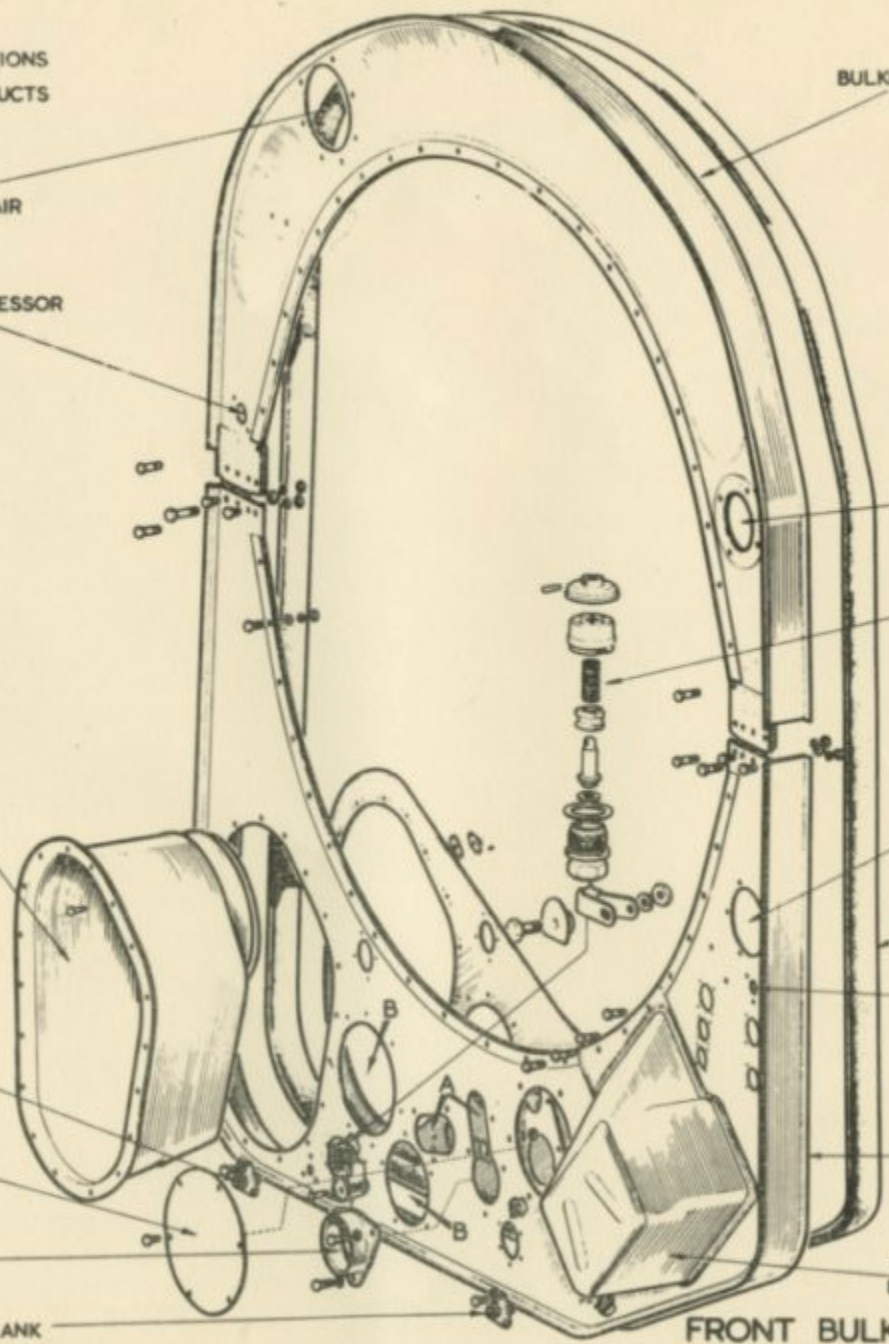
SEAL ASSY.
(INFLATOR STEM)
(EXHAUST STEM)

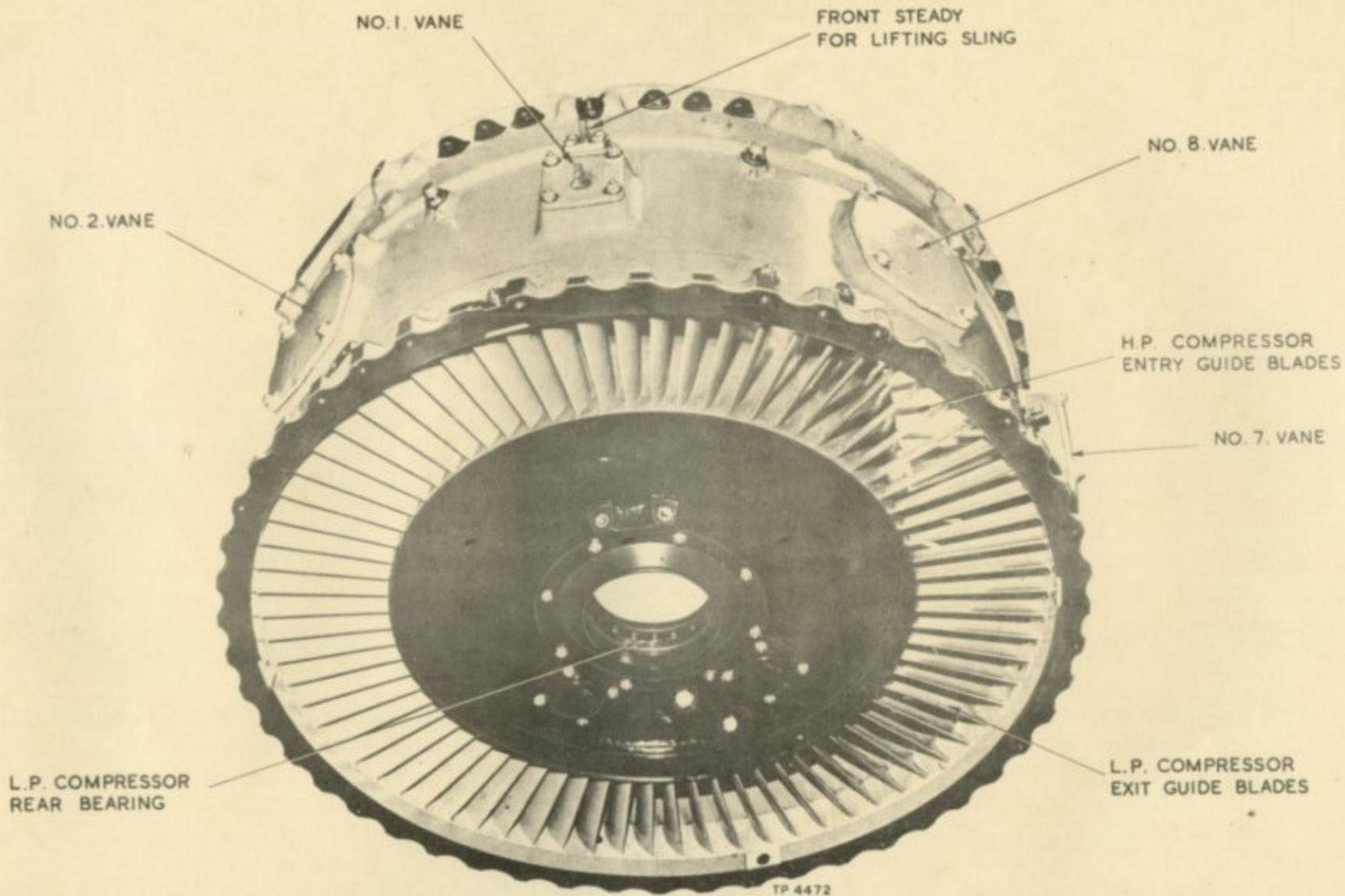
RAM AIR PIPE

BULKHEAD UNIT
BOTTOM

ELLIOT FLOW
METER COVER

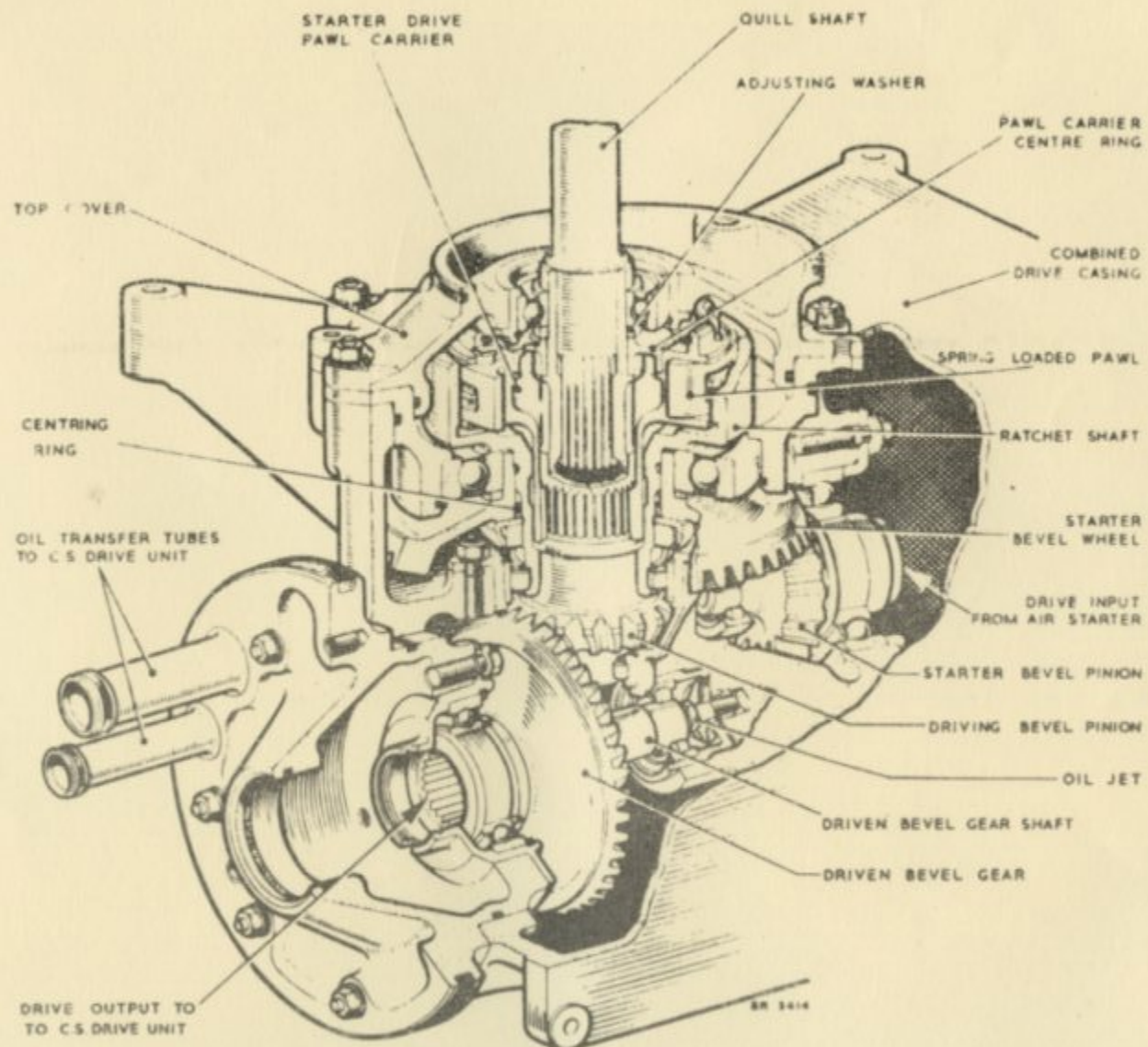
FRONT BULKHEAD TP-4588



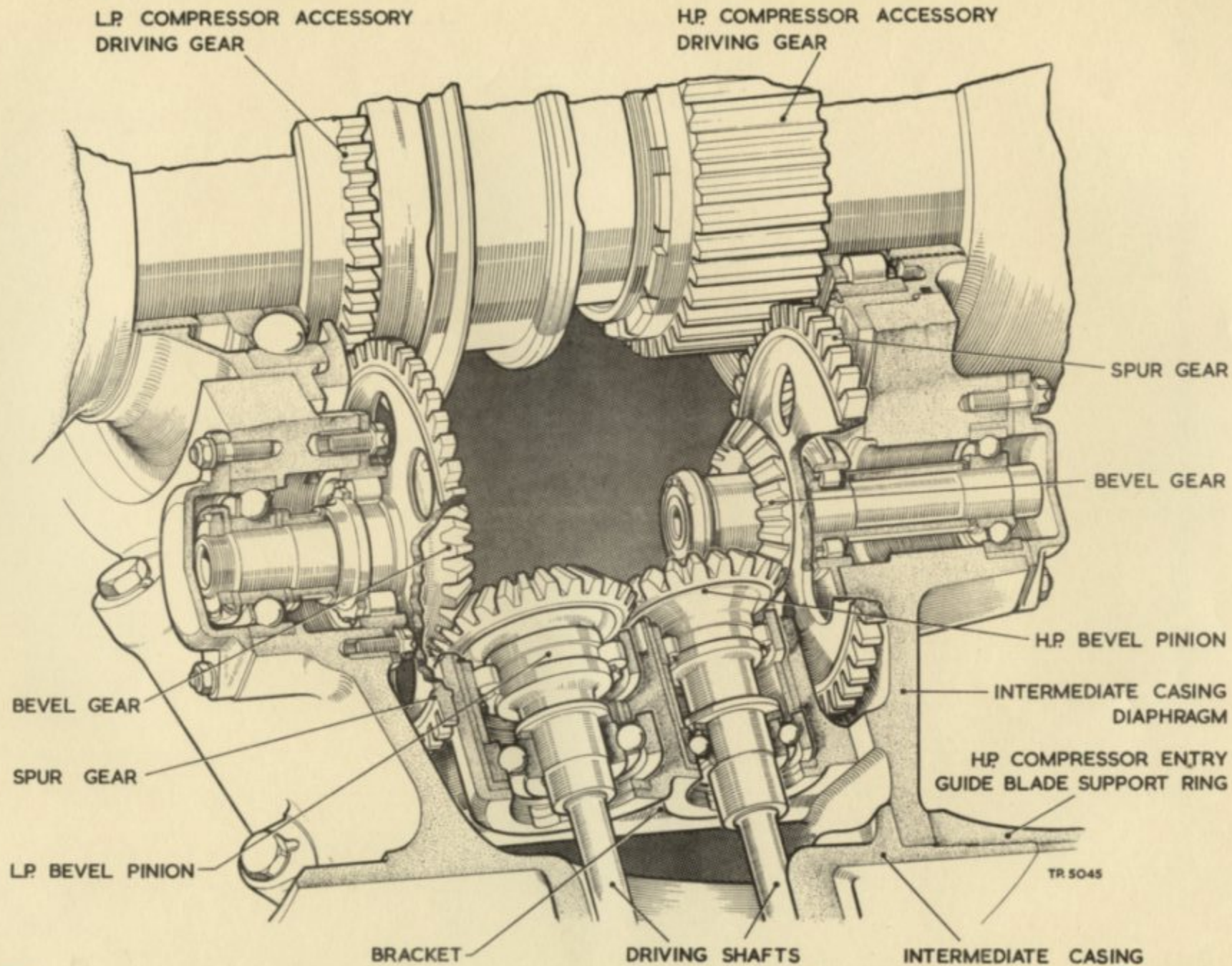


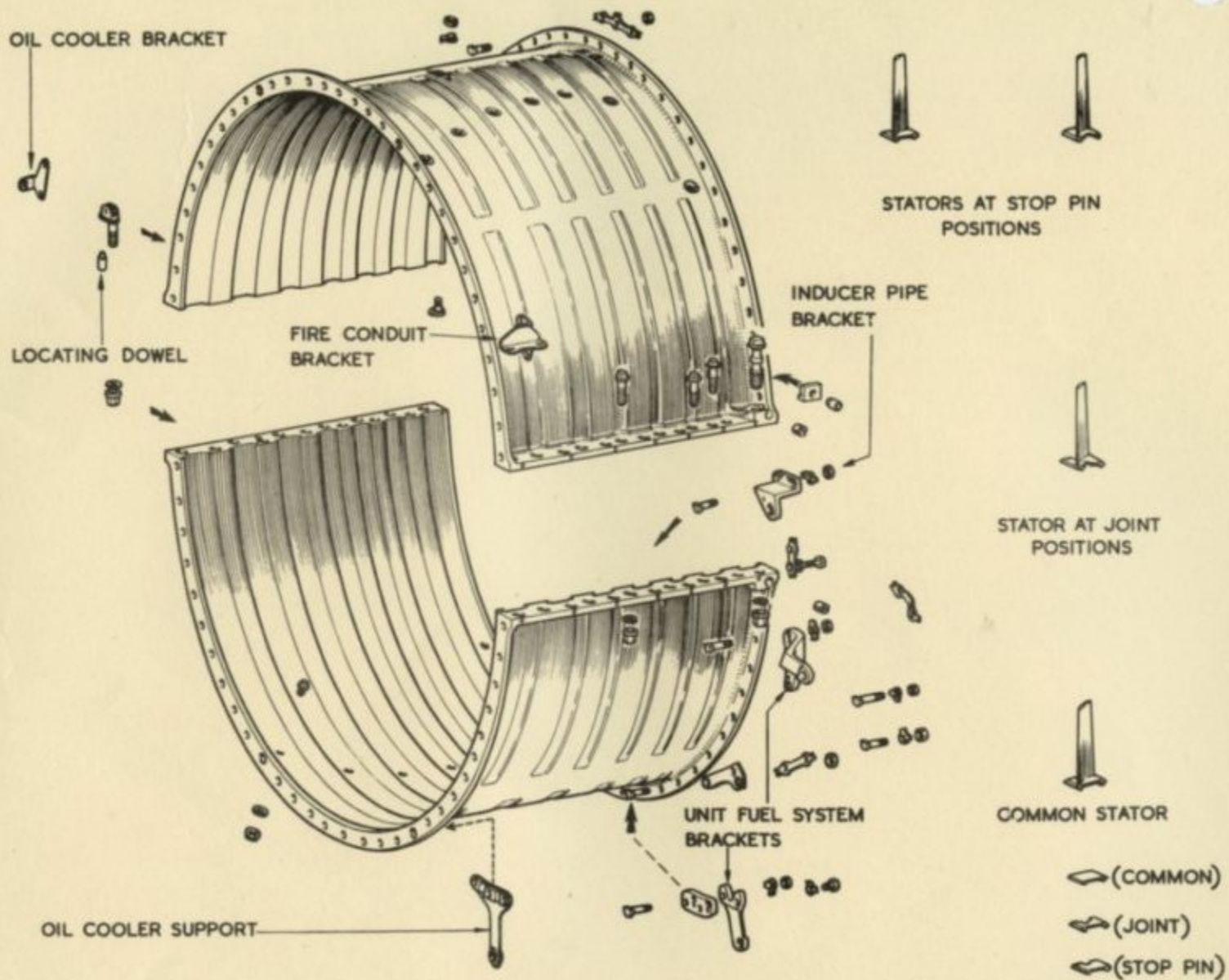
INTERMEDIATE CASING

Job No 1920
WAD/30/v28



Combined drive details



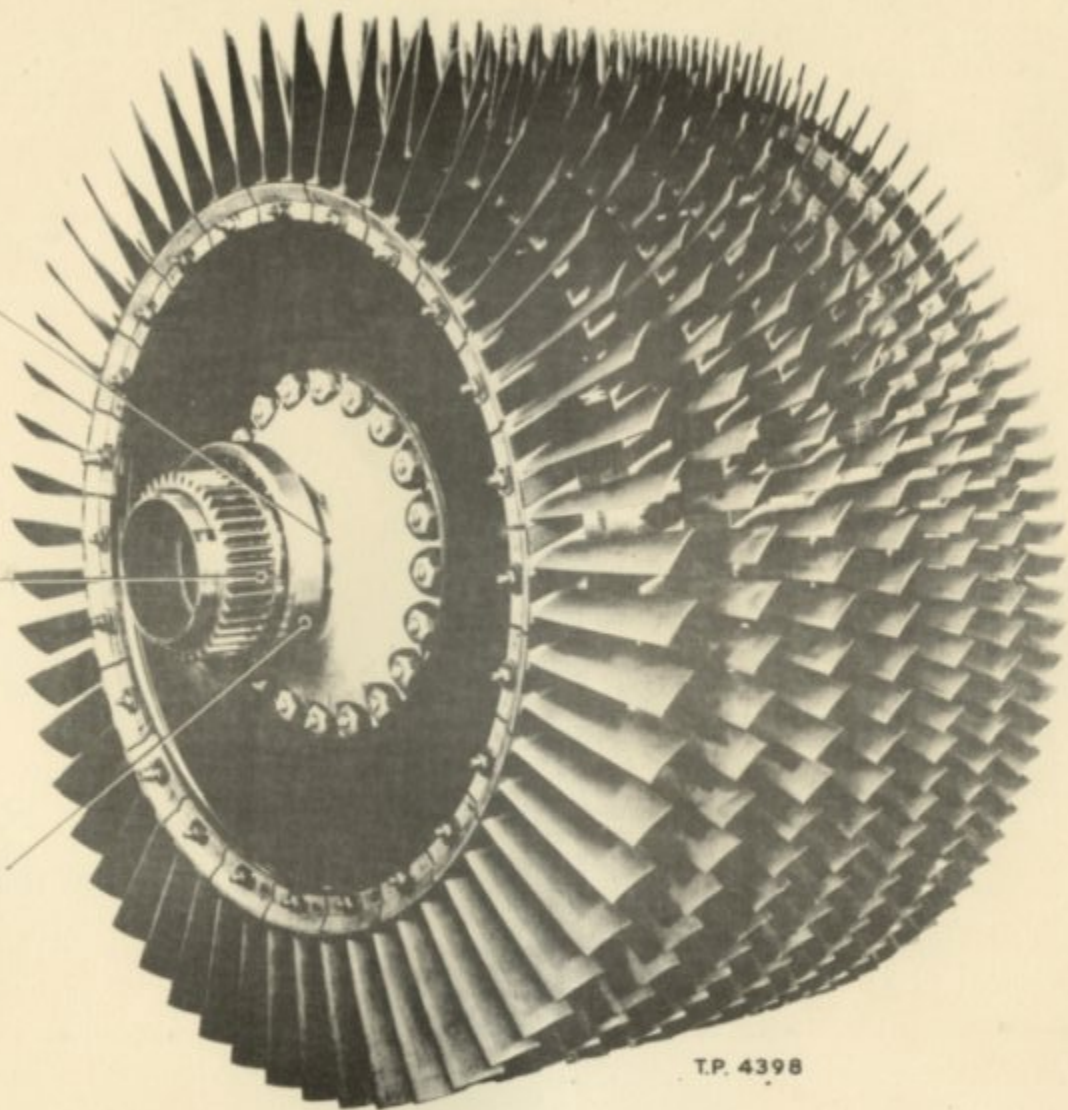


H.P. COMPRESSOR CASING

BEARING SEAL

DRIVING GEAR

FRONT BEARING



T.P. 4398

HIGH PRESSURE COMPRESSOR ROTOR $\frac{3}{4}$ FRONT VIEW

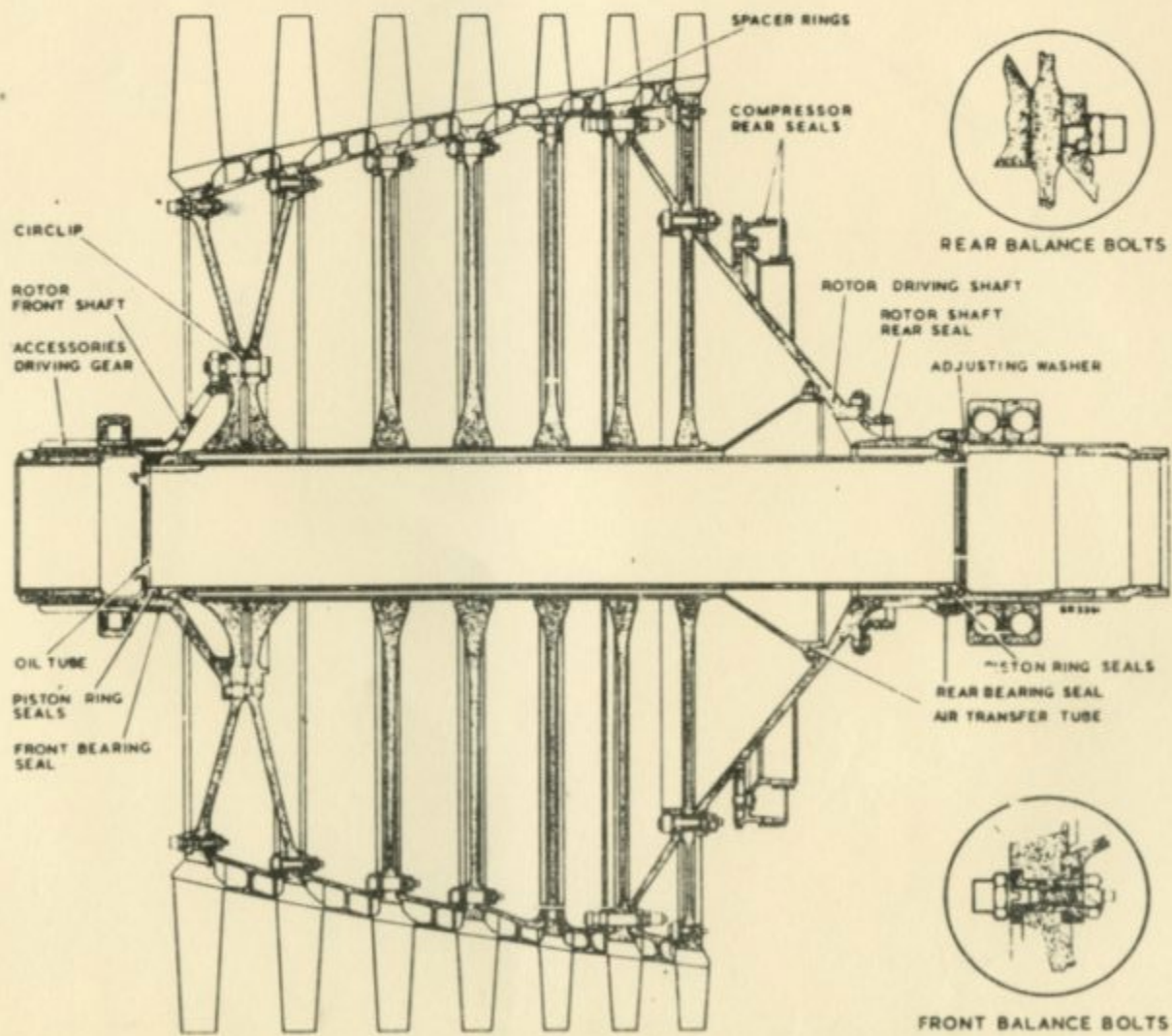
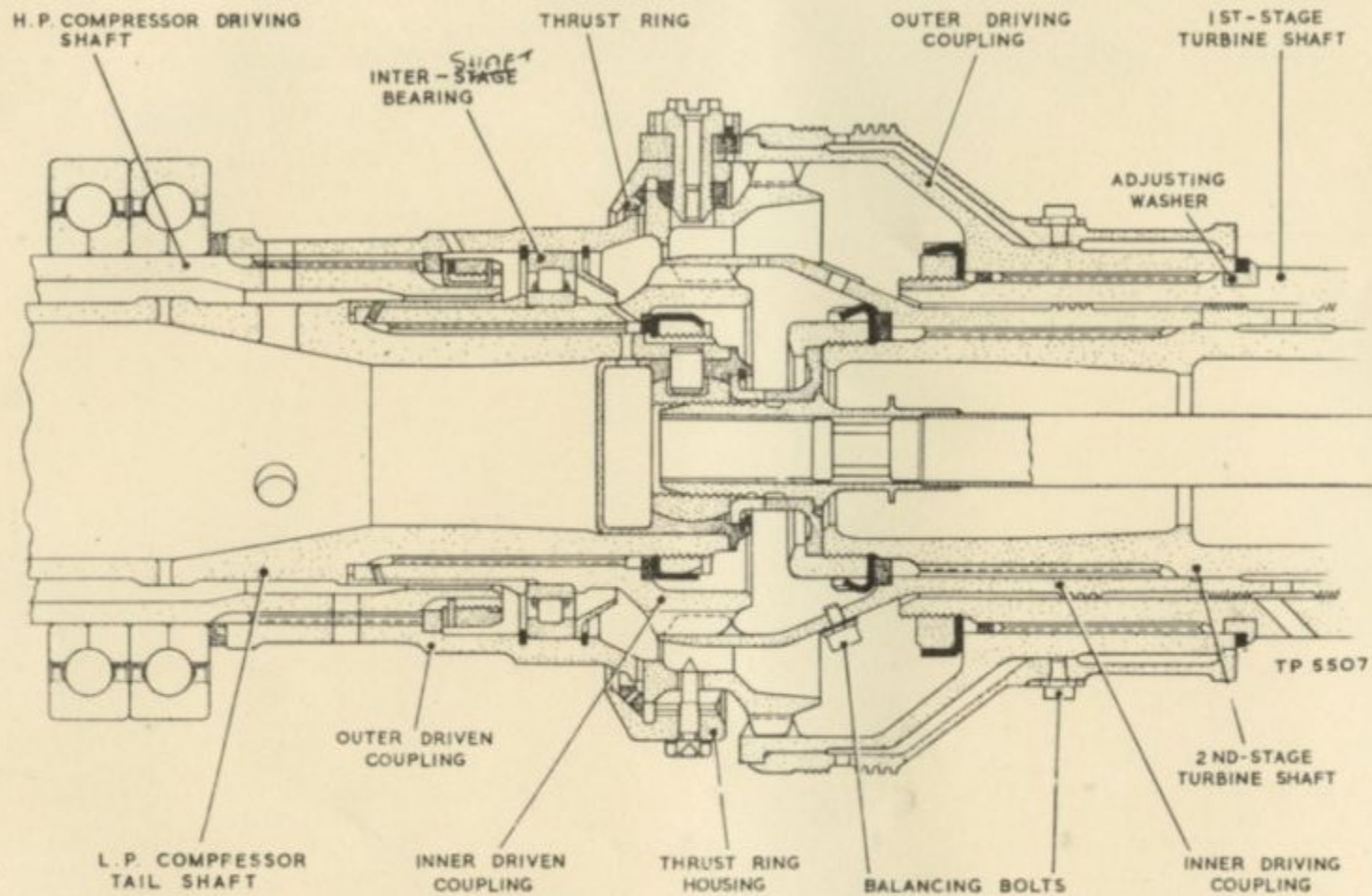
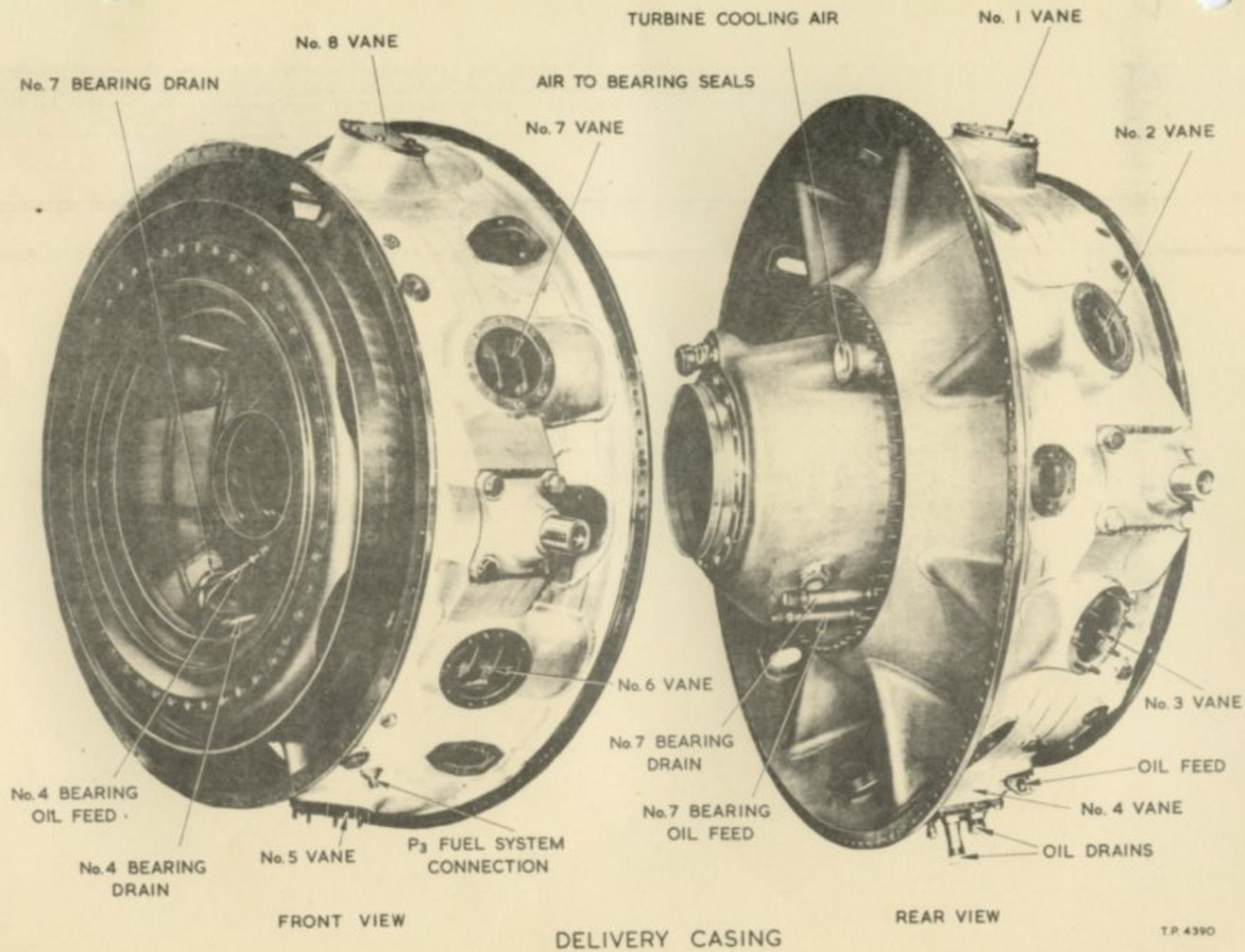
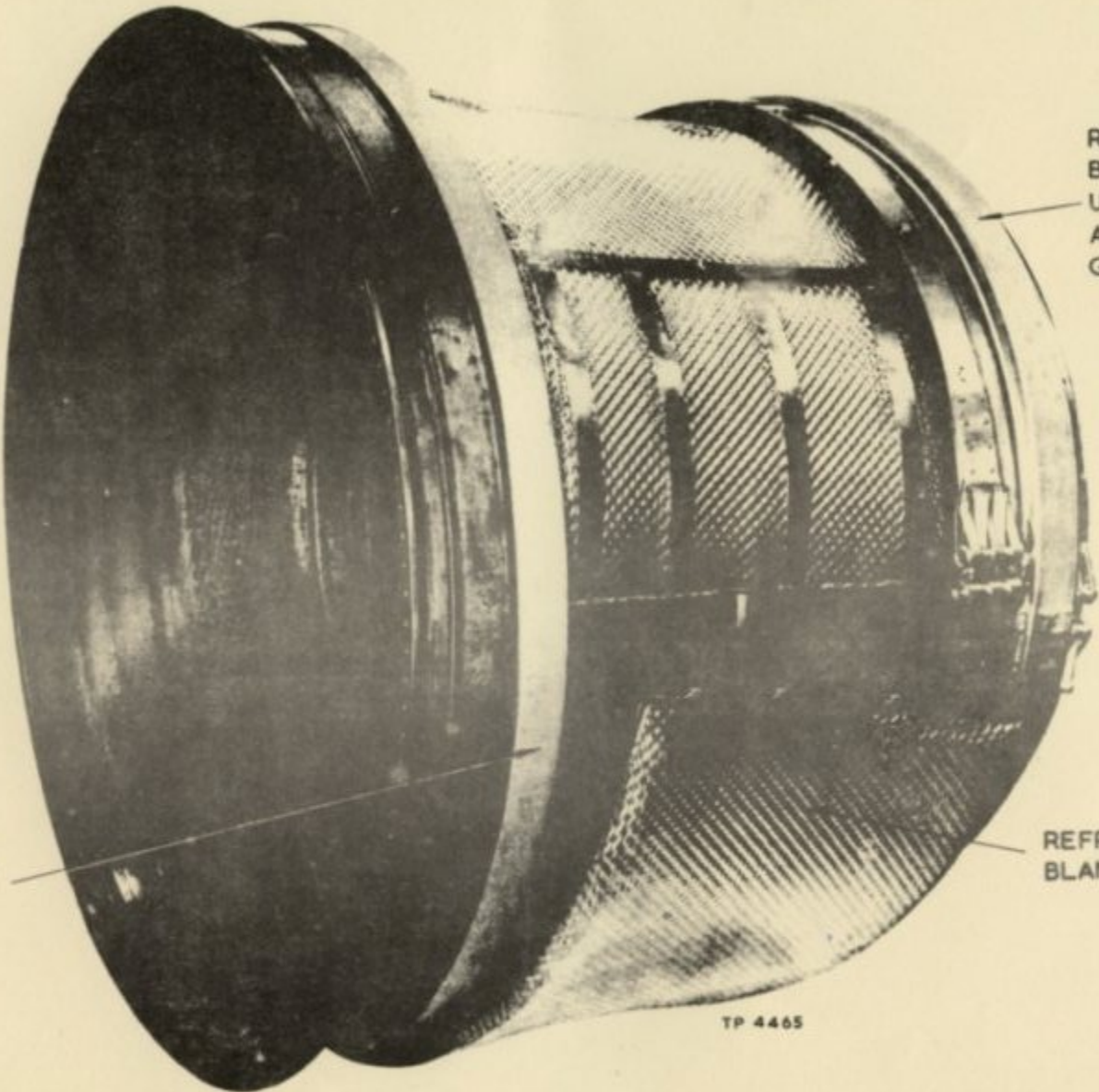


Fig. 48. H.P. compressor rotor—general arrangement



COMPRESSOR TO TURBINE COUPLING DETAILS





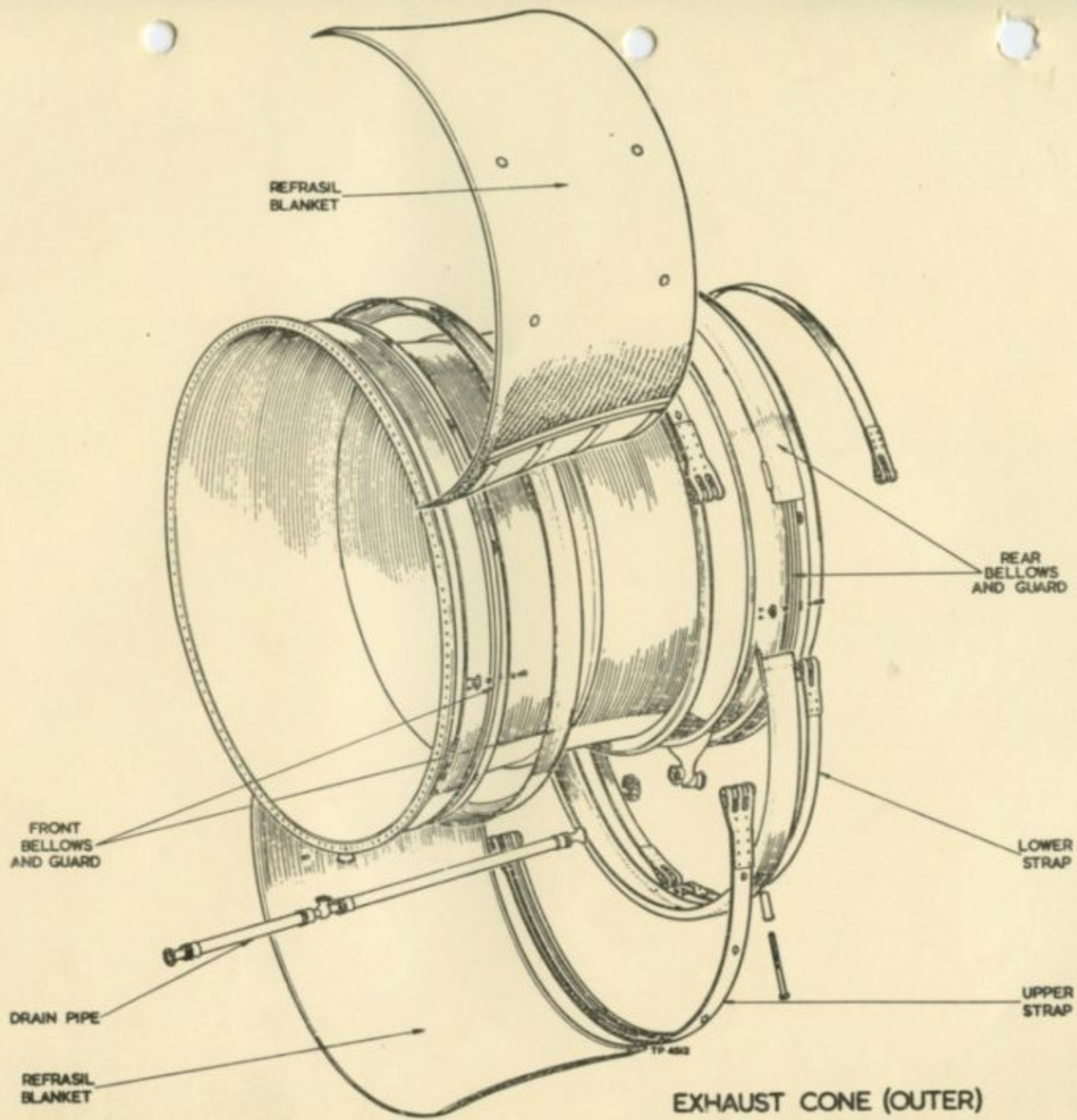
FRONT
BELLOWS
UNIT
AND
GUARD

REAR
BELLOWS
UNIT
AND
GUARD

REFRASIL
BLANKET

TP 4465

EXHAUST CONE OUTER $\frac{3}{4}$ FRONT VIEW



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