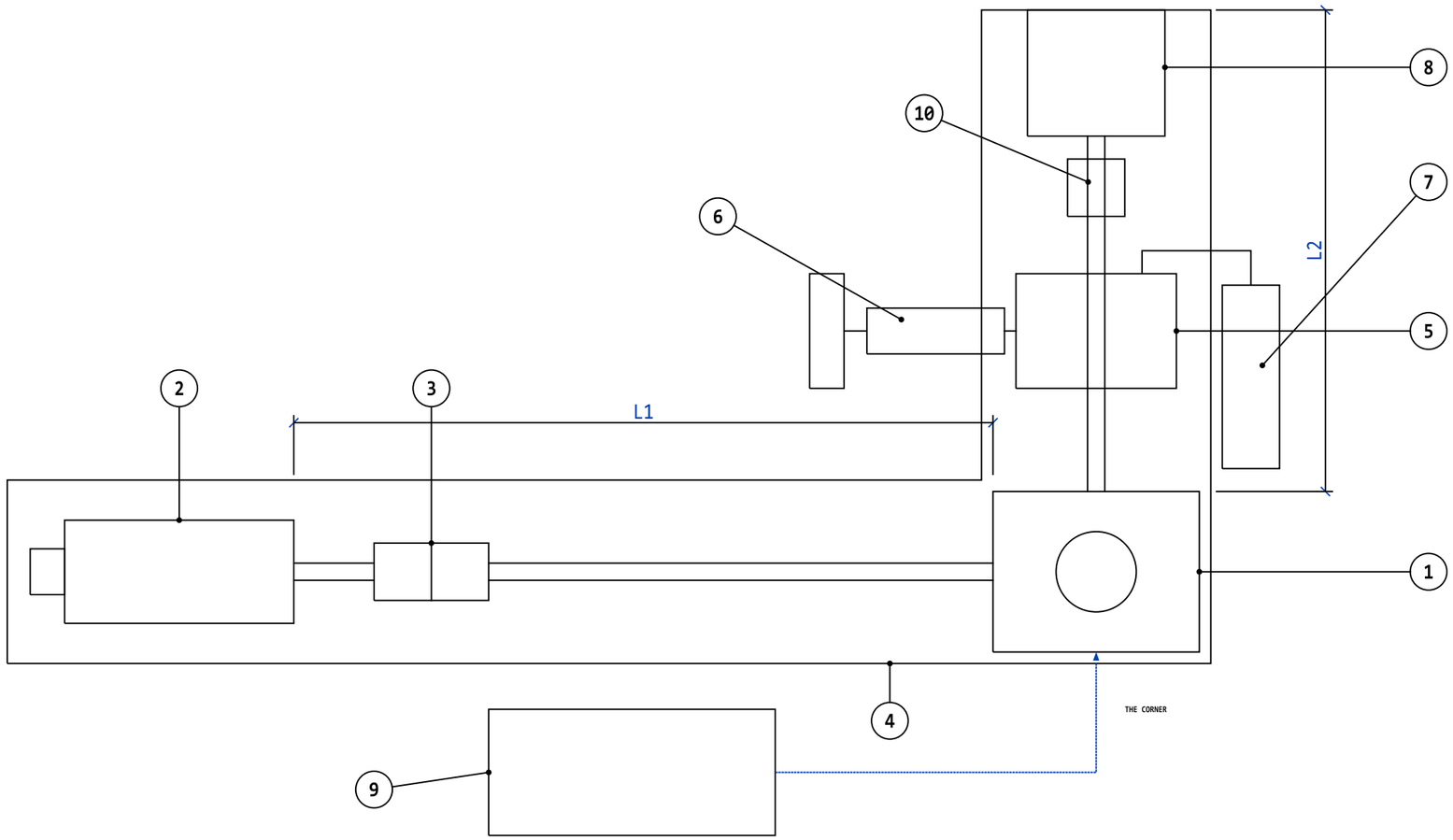
PLAN - TAIL GEARBOX RIG

NOT TO SCALE



THE GEARBOX TURNS THE POWER THROUGH A CORNER: THE INPUT RUNS ALONG THE FIRST ARM AND THE OUTPUT ALONG THE SECOND; THE OIL SKID FEEDS THE GEARBOX (DASHED)
THE LOADING HEAD PUTS THE BENDING (RADIAL ACTUATOR) AND THE THRUST (THRUST ACTUATOR, THROUGH A LINK) ON THE OUTPUT SHAFT TOGETHER WITH THE TORQUE
L1 AND L2 ARE THE LENGTHS OF THE TWO ARMS OF THE BEDPLATE; THE LOADING MOTOR M-2 TAKES THE TORQUE ON THE OUTPUT

NOTES

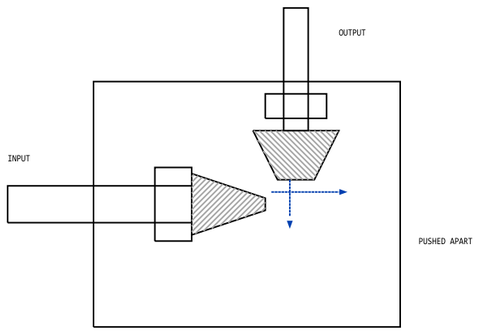
1. REFERENCE ARRANGEMENT OF A TAIL DRIVE TEST RIG. LETTERS ARE DIMENSIONS SET BY DESIGN: NO TORQUE, SPEED, POWER, FORCE, ANGLE OR SIZE VALUE IS GIVEN.
2. THE PLAN SHOWS THE TAIL GEARBOX RIG ON ITS L-SHAPED BEDPLATE: THE DRIVE MOTOR AND THE TORQUEMETER ON THE FIRST ARM, THE GEARBOX UNDER TEST AT THE CORNER, AND ITS OUTPUT SHAFT RUNNING ALONG THE SECOND ARM THROUGH THE OUTPUT LOADING HEAD TO THE LOADING MOTOR. L1 AND L2 ARE THE LENGTHS OF THE TWO ARMS.
3. DETAIL A: THE BEVEL PAIR IN SECTION. DETAIL B: THE OVERHUNG OUTPUT SHAFT, WITH ITS NEAR AND FAR BEARINGS. DETAIL C: THE INTERMEDIATE GEARBOX, WHERE TWO SHAFTS MEET AT AN ANGLE.
4. THE OIL AND PROTECTION CHAIN AND THE CURVES OF BEARING REACTION AGAINST OVERHANG AND OF RESONANCE AGAINST SHAFT STIFFNESS ARE ON SHEET 002. THE MOTORS, THE TORQUEMETERS, THE COUPLINGS, THE CHIP DETECTORS AND THE DATA ACQUISITION HARDWARE ARE CATALOGUE ITEMS, BOUGHT IN. NOBODY STANDS NEAR A LOADED GEARBOX.

ITEMS

ITEM	DESCRIPTION
1	TAIL GEARBOX UNDER TEST
2	DRIVE MOTOR M-1
3	TORQUEMETER
4	BEDPLATE
5	OUTPUT LOADING HEAD
6	RADIAL ACTUATOR
7	THRUST ACTUATOR
8	LOADING MOTOR M-2
9	OIL SKID
10	OUTPUT SHAFT

DETAIL A - THE BEVEL PAIR

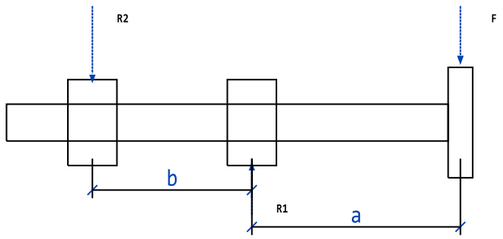
NOT TO SCALE



A BEVEL PAIR PUSHES ITS GEARS APART AND ALONG
THEIR SHAFTS AS THE TORQUE RISES: THE BEARINGS AND
THE CASE CARRY MORE THAN THE TORQUE ITSELF

DETAIL B - THE OVERHUNG OUTPUT

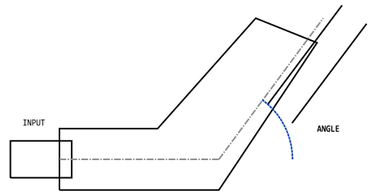
NOT TO SCALE



A FORCE F OUT AT THE END IS MULTIPLIED AT THE
NEAR BEARING R1: THE FAR BEARING R2 CARRIES IT THE
OTHER WAY; a IS THE OVERHANG AND b THE SPACING

DETAIL C - THE ANGLE

NOT TO SCALE



THE LOOP HAS TO PUT THE SAME ANGLE BACK,
WITH ANGLE DRIVES OR BELT DRIVES, OR THE LOAD
IS PUT ON BY A SECOND MOTOR

REFERENCE CONFIGURATION - NOT FOR CONSTRUCTION

NEOMETRIX DEFENCE LIMITED
ENGINEERED IN NOIDA - INDIA

TAIL DRIVE TEST RIG - REFERENCE CONFIGURATION

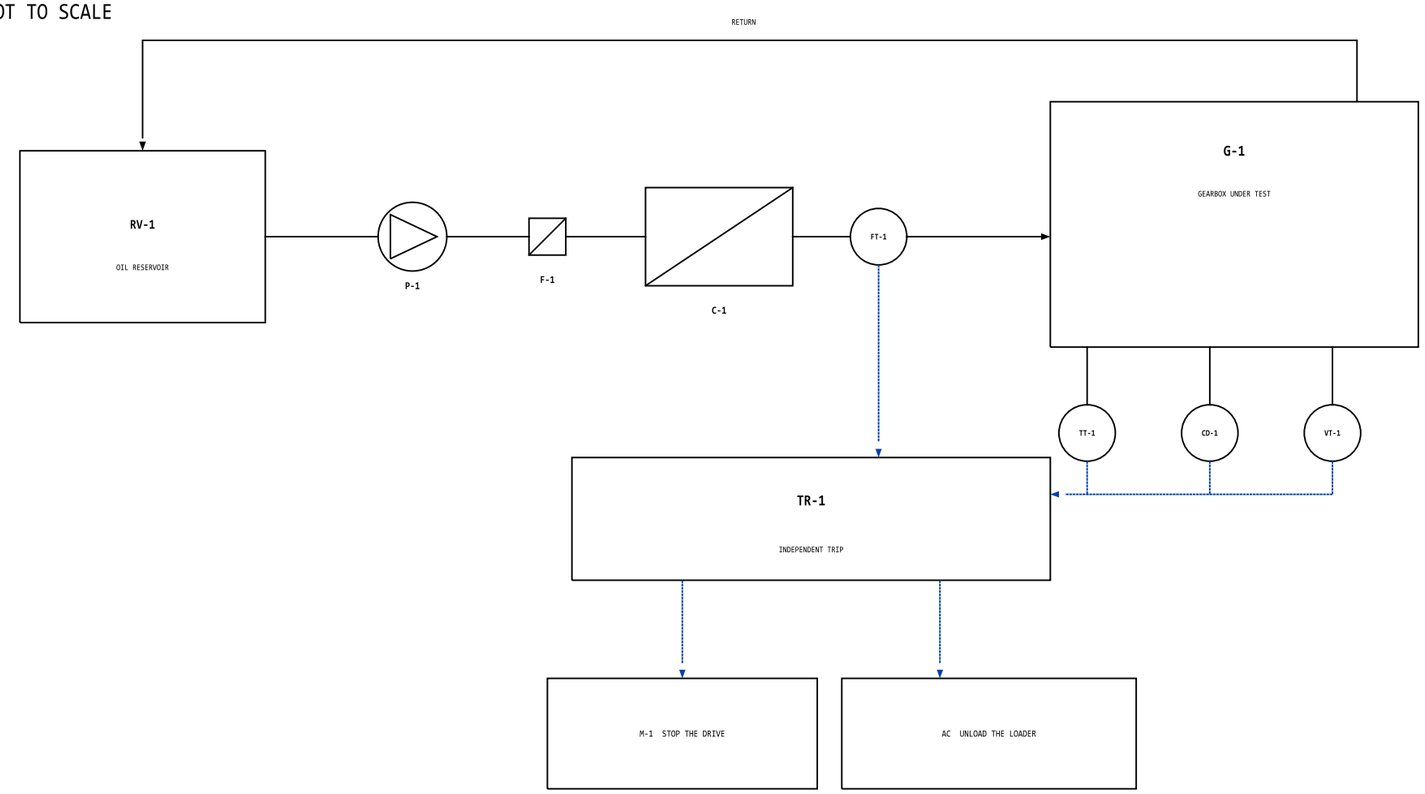
ARRANGEMENT AND DETAILS

THE RIG, THE GEARBOX, THE OUTPUT AND THE ANGLE

DWG NO	SCALE @ A3	SHEET	REV
NMX-TGB-108-001	NTS	1 OF 2	A
DATE	UNITS	DRAWN	STATUS
17-11-2026	TAGS ONLY	NMX-DO	REFERENCE

OIL AND PROTECTION CHAIN - TAIL DRIVE TEST RIG

NOT TO SCALE

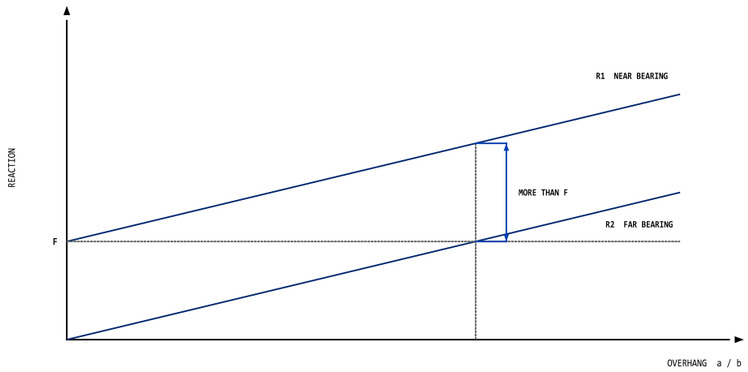


OIL: RV-1, PUMP P-1, FILTER F-1, COOLER C-1, FLOW FT-1 TO THE GEARBOX G-1; THE TEMPERATURE TT-1, THE CHIP DETECTOR CD-1 AND THE VIBRATION VT-1 SIT ON THE GEARBOX

THE TRIP TR-1 IS A CIRCUIT OF ITS OWN: IT TAKES FT-1, TT-1, CD-1 AND VT-1, STOPS THE DRIVE M-1 AND UNLOADS THE LOADER AC WITHOUT ASKING THE CONTROLLER

DETAIL A - THE NEAR BEARING

NOT TO SCALE - COMPUTED



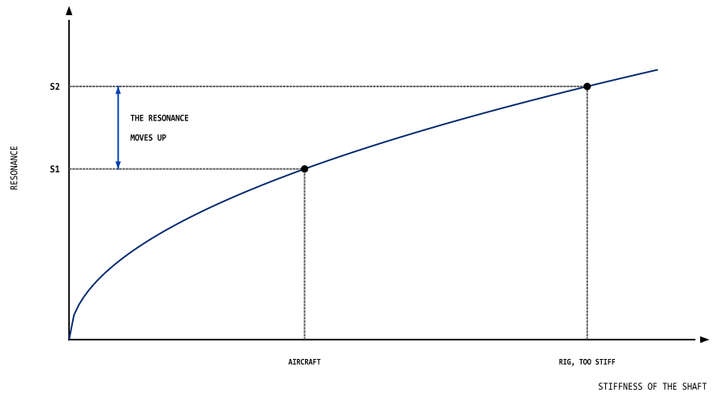
THE FORCE F OUT AT THE END IS MULTIPLIED AT THE NEAR BEARING: R1 IS MORE THAN F

A LONGER OVERHANG a, OR A CLOSER SPACING b, MULTIPLIES IT MORE

COMPUTED FROM STATICS, IN UNITS OF F: A PICTURE OF THE IDEA

DETAIL B - THE SHAFT BETWEEN

NOT TO SCALE - COMPUTED



TWO GEARBOXES JOINED BY A SHAFT RESONATE AT A FREQUENCY THAT RISES WITH THE STIFFNESS OF THE SHAFT

S1 IS THE RESONANCE WITH THE AIRCRAFT SHAFT AND S2 WITH A RIG SHAFT THAT IS TOO STIFF: THE RIG HIDES S1

COMPUTED FROM A TWO-INERTIA MODEL: A PICTURE OF THE IDEA, NOT A MEASUREMENT

NOTES

1. REFERENCE OIL AND PROTECTION CHAIN OF A TAIL DRIVE TEST RIG. TAGS AND LETTERS ONLY: NO TORQUE, SPEED, POWER, FORCE, ANGLE OR SIZE VALUE IS GIVEN.
2. THE OIL GOES FROM THE RESERVOIR RV-1 THROUGH THE PUMP P-1, THE FILTER F-1, THE COOLER C-1 AND THE FLOW TRANSMITTER FT-1 TO THE GEARBOX UNDER TEST G-1, AND RETURNS. THE TEMPERATURE TT-1, THE CHIP DETECTOR CD-1 AND THE VIBRATION PROBE VT-1 SIT ON THE GEARBOX.
3. THE TRIP TR-1 IS A CIRCUIT OF ITS OWN: IT TAKES FT-1, TT-1, CD-1 AND VT-1, STOPS THE DRIVE M-1 AND UNLOADS THE OUTPUT LOADER AC WITHOUT ASKING THE CONTROLLER.
4. DETAIL A: BEARING REACTIONS OF AN OVERHUNG OUTPUT SHAFT AGAINST THE OVERHANG a / b. THE NEAR BEARING R1 CARRIES MORE THAN THE FORCE F, AND THE FAR BEARING R2 CARRIES IT THE OTHER WAY.
5. DETAIL B: THE RESONANCE OF TWO GEARBOXES JOINED BY A SHAFT AGAINST THE STIFFNESS OF THE SHAFT. A RIG SHAFT THAT IS TOO STIFF MOVES THE RESONANCE, SO THE RIG CARRIES A STAND-IN SHAFT OF THE RIGHT STIFFNESS.
6. THE CURVES ARE COMPUTED FROM SIMPLE MODELS, IN RELATIVE UNITS: A PICTURE OF THE IDEA, NOT A MEASUREMENT. THE ARRANGEMENT AND THE DETAILS ARE ON SHEET 001. NOBODY STANDS NEAR A LOADED GEARBOX.

REFERENCE CONFIGURATION - NOT FOR CONSTRUCTION

NEOMETRIX DEFENCE LIMITED

ENGINEERED IN NOIDA - INDIA

TAIL DRIVE TEST RIG - REFERENCE CONFIGURATION

OIL, PROTECTION, CURVES

THE OIL AND PROTECTION CHAIN AND THE CURVES OF THE IDEA

DWG NO	SCALE @ A3	SHEET	REV
NMX-TGB-108-002	NTS	2 OF 2	A
DATE	UNITS	DRAWN	STATUS
17-11-2026	TAGS ONLY	NMX-DO	REFERENCE