

GRADUA: INDUSTRIA TEKNOLOGIEN  
INGENIERITZA  
**GRADU AMAIERAKO LANA**

***AUTOMOZIOKO BIRABARKI BATEN PRO-  
ZESU ORRIAREN GARAPENA***

***3. ERANSKINA BIRABARKIAREN PLANOAK***

**Ikaslea:** ARRIZABALAGA SAGASTA, JON

**Zuzendaria:** CELAYA EGÜEN, AINHOA

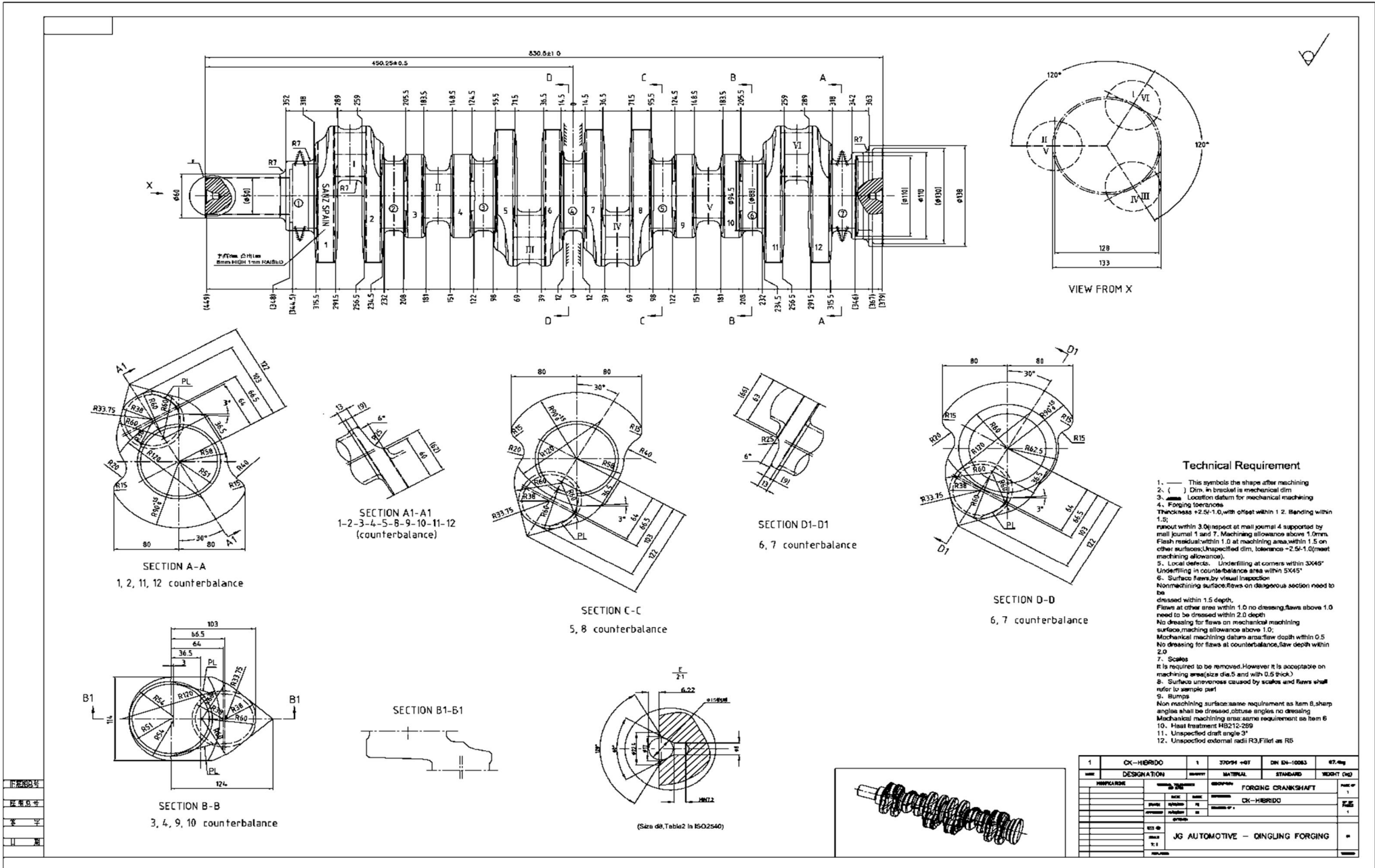
**Ikasturtea:** 2017-2018

**Data:** Bilbon, 2018ko Uztailaren 24an

## AURKIBIDEA

|                                           |   |
|-------------------------------------------|---|
| 1. Birabarkiaren forjako planoak.....     | 3 |
| 2. Birabarkiaren mekanizazio planoak..... | 4 |

### 3. Eranskina. Birabarkiaren planoak



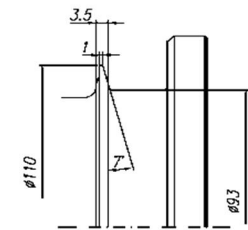
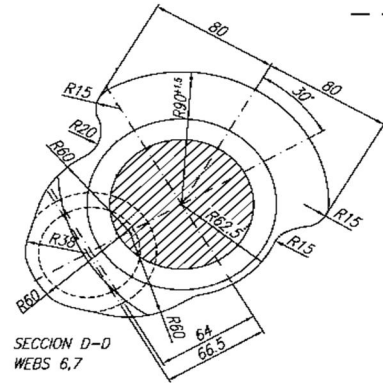
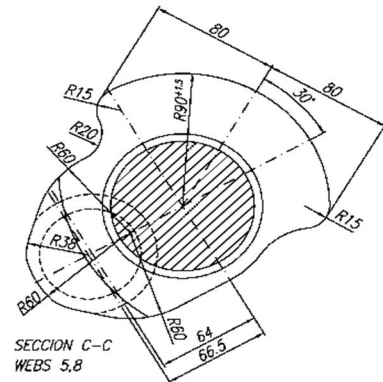
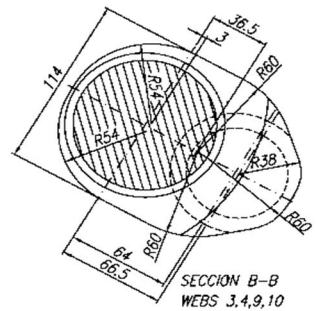
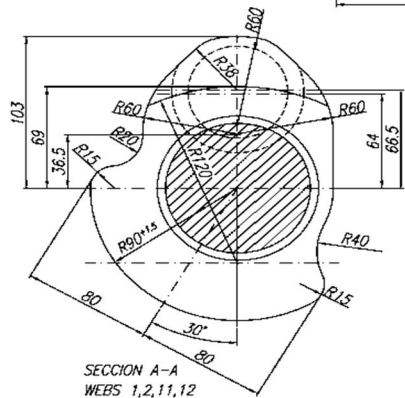
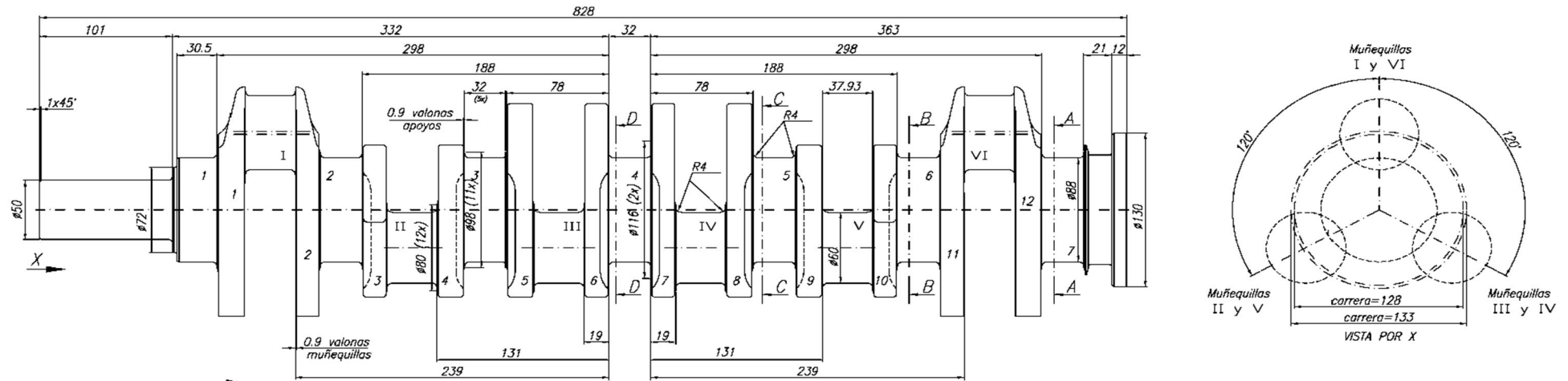
#### Technical Requirement

1. — This symbol the shape after machining
2. ( ) Dim. in bracket is mechanical dim
3. Location datum for mechanical machining
4. Forging tolerance
- Thickness +2.5/-1.0, with offset within 1.2. Bending within 1.5;
- runout within 3.0 (respect at main journal 4 supported by main journal 1 and 7. Machining allowance above 1.0mm. Flash residual: within 1.0 at machining area, within 1.5 on other surfaces; (Unspecified dim. tolerance = 2.5/-1.0 (most machining allowance)).
5. Local defects. Underfilling at corners within 3x45°
- Underfilling in counterbalance area within 5x45°
6. Surface flaws by visual inspection: Non-machining surface flaws on dangerous section need to be dressed within 1.5 depth. Flaws at other area within 1.0 no dressing, flaws above 1.0 need to be dressed within 2.0 depth. No dressing for flaws on mechanical machining surface, machining allowance above 1.0; Mechanical machining datum area: flaw depth within 0.5. No dressing for flaws at counterbalance, flaw depth within 2.0
7. Scallops: It is required to be removed. However it is acceptable on machining area (size dia 5 and with 0.5 thickness)
8. Surface unevenness caused by scallops and flaws shall refer to sample part
9. Bumps: Non-machining surface: same requirement as item 8, sharp angles shall be dressed, obtuse angles no dressing. Mechanical machining area: same requirement as item 6
10. Heat treatment H421c-209
11. Unspecified draft angle 3°
12. Unspecified external radii R3, Fillet as R6

| 1   | CK--HERIDO                       | 1    | 27094 +01 | DN 51-1003 | 67.4kg      |
|-----|----------------------------------|------|-----------|------------|-------------|
| NO. | DESIGNATION                      | REV. | MATERIAL  | STANDARD   | WEIGHT (kg) |
| 1   | FORGING CRANKSHAFT               |      |           |            | 1           |
| 2   | CK--HERIDO                       |      |           |            | 1           |
| 3   | JG AUTOMOTIVE - QINGLING FORGING |      |           |            |             |

1. 审核  
 2. 设计  
 3. 工艺  
 4. 材料  
 5. 检验

### 3. Eranskina. Birabarkiaren planoak



ONLY VALID FOR QUOTATION  
NOT FOR PRODUCTION

| REVIZIÓ | DATA     | DESCRIPCIÓ | PROYECTO   | CLIENTE |
|---------|----------|------------|------------|---------|
| 01      | 06/12/19 | PROYECTO   | CK-HIBRIDO | CO      |
| 02      |          |            |            |         |
| 03      |          |            |            |         |
| 04      |          |            |            |         |
| 05      |          |            |            |         |
| 06      |          |            |            |         |
| 07      |          |            |            |         |
| 08      |          |            |            |         |
| 09      |          |            |            |         |
| 10      |          |            |            |         |
| 11      |          |            |            |         |
| 12      |          |            |            |         |

Ciguitales **SRNZ**  
 ZARAGOZA (SPAIN)