

Motor Rules

Approved Motors for use in IRRA[®] Racing

Topline Falcon 7, part number ATCD302
JK Falcon 7, part number JK30207



- 65 turns (nominal) of 30 AWG wire (nominal)
- Stack length - .375"
- Arm timing - 15 degrees nominal
- Diameter - .513"
- Magnets - Neodymium
- Internal brushes and springs
- Oilite bushings

JK Retro Hawk FK, part number JKHR



- 65 turns (nominal) of 30 AWG wire (nominal)
- Stack length - .390"
- Arm timing - 15 degrees nominal, commutator tied
- Diameter - .513"
- Magnets - Neodymium
- Internal brushes and springs
- Oilite bushings

The armature shaft on the endbell side of JK Hawk Retro motors *may not* be cut or shortened.

TSR D3, part number TD301



- 65 turns (nominal) of 30 AWG wire (nominal)
- Stack length - .375"
- Arm timing - 3 degrees nominal
- Diameter - .513"
- Magnets - Neodymium
- Internal brushes and springs
- Oilite bushings

Pro Slot Euro Mk 1, sealed, with Chinese-made arm, part number PS4002 – refurbishable



- 60 turns (nominal) of 31 AWG wire (nominal)
- Stack length - .400"
- Diameter - .513"
- Arm timing - 20 degrees nominal
- Magnets - ceramic
- External brushes and springs
- Oilite bushings

Pro Slot Euro Mk 1, sealed, with Chinese-made arm, part number PS4002FK – not refurbishable



- 65 turns (nominal) of 30 AWG wire (nominal)
- Stack length - .400"
- Diameter - .513"
- Arm timing - 15 degrees nominal
- Magnets - Neodymium
- External brushes and springs
- Oilite bushings

Pro Slot Euro Mk 1 "Puppy Dog", sealed, with American-made arm, part number PS4002B or PS4002B-B – refurbishable



- 75 turns of 31 AWG wire
- Stack length - .400"
- Diameter - .513"
- Arm timing - 25 degrees nominal
- Magnets - ceramic
- External brushes and springs
- Oilite bushings

Slick 7 Mini Brute, part number S7-588A



- 82 turns (nominal) of 31 AWG wire (nominal)
- Stack length - .375"
- Arm timing - 5 degrees nominal
- Diameter - .513"
- Magnets - ceramic
- Internal brushes and springs
- Oilite bushings

Note: armature dimensions exclude any coatings, if present.

Notes:

- 1) Both the specified winds and wire sizes are nominal figures, with allowances for production variances to be permitted.
- 2) A protested FK motor (Falcon 7, Retro Hawk, and TSR D3) armature will be deemed legal if the sum of wire winds counted on all three poles is no less than 193 winds and if no single pole has less than 63 winds. In other words, a variance of -2 total wires winds from the nominal total winds spec will be permitted. For example, an FK armature with wire wind counts of 65, 64, 64 on the three poles would be deemed legal, as would an armature with wire wind counts of 65, 65, 63. An armature with wind counts of 65, 64, 63 would not be legal.
- 3) A protested Pro Slot PS4002 Chinese armature will be deemed legal if the sum of wire winds counted on all three poles is no less than 178 winds and if no single pole has less than 58 winds.
- 4) A protested Slick 7 Mini Brute armature will be deemed legal if the sum of wire winds counted on all three poles is no less than 244 winds and if no single pole has less than 80 winds.
- 5) The specified AWG wire sizes on all motors are nominal values and minor allowances from the exact AWG specification will be permitted at the discretion of the IRRA[®] Board of Directors.

If a manufacturer releases a new or modified version of a previously-approved IRRA[®] motor without informing the IRRA[®] of such changes, the IRRA[®] Board, at its discretion, may remove that motor from the list of motors approved for use in IRRA[®] competition. IRRA[®] also reserves the right to add new motors or to remove any previously-approved motor from the list of approved motors.

Any motors with changed specifications submitted for IRRA[®] approval must carry a new part number. The IRRA[®] reserves the right to ask manufacturers for unique tags and/or can markings for identification purposes on motors submitted for inclusion in the IRRA[®] approved motors list.

Approved refurbishers for Pro Slot Motors:

Fast Ones: contact is [Ron Hershman](#)

Pro Slot Ltd: contact is [Dan DeBella](#)

IRRA[®] Motor Refurbisher Requirements

Applies to: Pro Slot Ltd and Fast Ones, as designated IRRA[®] Service Centers performing refurbishing work on Pro Slot PS4002, PS4002B, and PS 4002B-BB motors

IRRA[®] Service Center operators are NOT permitted to enter IRRA[®] events using Pro Slot motors that they themselves have refurbished. Refurbishers will be required to race ONLY using Pro Slot motors that have been refurbished and sealed by another approved IRRA[®] Service Center, or new motors obtained from factory-sealed packaging.

IRRA[®] Service Centers must certify that any motor submitted in one or more of the following conditions will **not** be refurbished:

- 1) A motor that is unassembled, modified, and/or where work obviously was done elsewhere, i.e. not by one of the two IRRA[®] Service Centers.
- 2) A motor received with a damaged seal that doesn't cover at least two screws. Older production motors using foil seals or that were produced without endbell screws will be refurbished at the refurbishers discretion pending validation of specifications.
- 3) Refurbishers will **not** "verify and seal" motors as the only "work" performed.
- 4) Refurbishers will not seal any out-of-spec motors. Any motor with parts found to be illegal and out-of-spec with evidence of tampering will be destroyed. Parts found to be out-of-spec without signs of tampering will be replaced by Pro Slot.
- 5) The Service Centers will communicate to IRRA[®] BoD receipt of **any and all** motors with out-of-spec or illegal parts.

IRRA[®] Motor Specifications and Rules

Applies to: Pro Slot 4002B and Pro Slot 4002B-B motors.

- 1) All motors must remain unmodified and as produced by Pro Slot.
- 2) "Pre-furbished" motors, i.e. new motors that are refurbished before being used, are not allowed.
- 3) Armatures are to be tagged "PD".
- 4) Armatures are to be wound with 75 turns of 31 gauge wire.
- 5) Minimum armature diameter is .512"; minimum armature stack length is .390".
- 6) Commutator timing is not to be modified from the factory "25 degrees nominal" setting. Arms with over 30 degrees timing will be replaced by Pro Slot if no evidence of tampering is detected; if tampering is detected, the arm will be destroyed.
- 7) Armatures are to be balanced, rebalanced, and commutators re-trued by authorized IRRA[®] Service Centers **only**.
- 8) Motor cans must remain unmodified and as produced by Pro Slot. Grinding where the can is soldered to the motor bracket is permitted.
- 9) Motor air gap is not to be changed/modified from its factory specifications, which is a nominal .530". Air gap must measure between .525" and .540".
- 10) Magnets must be unmodified stock Pro Slot factory production units only and cannot be honed or ground. Magnets will be retained in place using clear CA ("Super Glue") only. Magnet recharging is allowed.
- 11) Ball bearing is allowed on can side of motor only. No endbell ball bearings allowed. Can ball bearing and can oilite bushing may be soldered in place.
- 12) Endbells are to remain unmodified. Stock factory endbell hardware is to be used unmodified (any grinding of the hoods done at the Pro Slot factory for commutator clearance is allowed). Hardware screws may be changed in case of a stripped endbell.
- 13) Only three-coil motor springs of any brand are allowed. Springs may be "tweaked" to adjust tension.
- 14) Any 36D size motor brushes may be used. Brushes may be radiused but any other cutting, slotting, drilling, or modification of the brush face contacting comm is **not** allowed. Narrowing of brush height or width is **not** allowed. Shunt wires and spring insulation are **not** allowed.
- 15) Can to endbell screws must be used, with an unmodified refurbisher's seal covering the screws. Only Pro Slot and Fast Ones seals may be used. Seals may be protected with clear coating. Damaged seals must retain a single piece of seal material covering at least two endbell screws.
- 16) External clip-on motor heatsinks and commutator arm-shaft mounted coolers are allowed.

IRRA[®] Motor Rules

Applies to: Topline & JK Falcon 7, JK Retro Hawk FK, TSR D3, and Slick 7 Mini Brute

- 1) All motors must remain unmodified and as produced by the manufacturer.
- 2) Motor cans must remain unmodified and as produced by the manufacturer. Factory external motor can dimensions may not be changed by crushing or other methods. Grinding where the can is soldered to the motor bracket is permitted.
- 3) Factory armature timing must remain unmodified.
- 4) Endbells may not be removed and reinstalled.
- 5) External clip-on motor heatsinks and commutator arm-shaft mounted coolers are allowed.
- 6) The armature shaft on the endbell side of JK Hawk Retro motors *may not* be cut or shortened.

Motor Protest Procedure

Any competitor racing in the same class/race as another competitor may protest another racer's motor. The protest **must** be filed with the official in charge of event **before the completion of the race in which the suspect motor is being raced/used**.

The fee for protesting another motor varies with the type of motor:

For Pro Slot motors (i.e. PS4002, 4002B, PS4002B-B), protest fee is **\$75**.

For all other motors (i.e. Topline or JK Falcon, Hawk Retro, TSR D3, Slick 7 Mini Brute), protest fee is **\$40**.

The protest fee must be paid in cash immediately after the race finishes.

At the conclusion of the race, the protested motor will be removed from the car by the race official or in front of the race official. Once the motor is out of the car the race official will mark the motor, which will be impounded by the official in charge to be sent in for teardown and verification. The impounded motor will be sent to the IRRA[®] Motor Chair or his designate for verification.

The race results will stand, to be amended later if the protested motor is found to be illegal or out of spec.

The IRRA[®] BoD will be notified of the results of the motor inspection and verification process. IRRA[®] will release an official statement of the findings within ten days. Said statement may include notification that the racer using the illegal motor was found in violation and subject to the statement in the Exclusion Clause of the rules.

If the motor is found to be illegal or out of spec, the protester will get his protest fee returned in full.

If the motor is found to be legal and in spec, the motor's owner will receive the full protest fee.