

PTO TOP SUB

INSPECT PTO TOP SUB AFTER EVERY RUN DOWN HOLE

TORQUE TO 30 LB FT

O-RING #224

O-RING #222

MEASURE OUTER DIAMETER
MINIMUM = $\phi 3.120"$

REBUILD KIT PART NO. 307RK

ASSEMBLY STEPS

- TORQUE ITEM 2 TO TOP TANDEM SUB
- FULLY THREAD ITEM 1 INTO CCL/BRT, BUT DO NOT TIGHTEN
- ORIENT CHARGES WITH WEIGHT BAR BY ROTATING ITEM 2
- TORQUE ITEM 1 INTO CCL/BRT BY WRENCHING ON ITEM 3
- TIGHTEN SET SCREWS

TOP SUB

INSPECT TOP SUB AFTER EVERY RUN DOWN HOLE

PART NO.	THREAD	O-RING "M"	REBUILD KIT
313272	1-5/8"	#222	272RK
313595	1-7/8"	#224	595RK

MEASURE OUTER DIAMETER
MINIMUM = $\phi 3.120"$

O-RING #113

O-RING "M"

UP HOLE

REUSABLE SUB

OPTIONAL SUB SAVER, PART NO. 900130

RETAINER NUT TO UP HOLE SIDE
TORQUE TO 40 LB FT

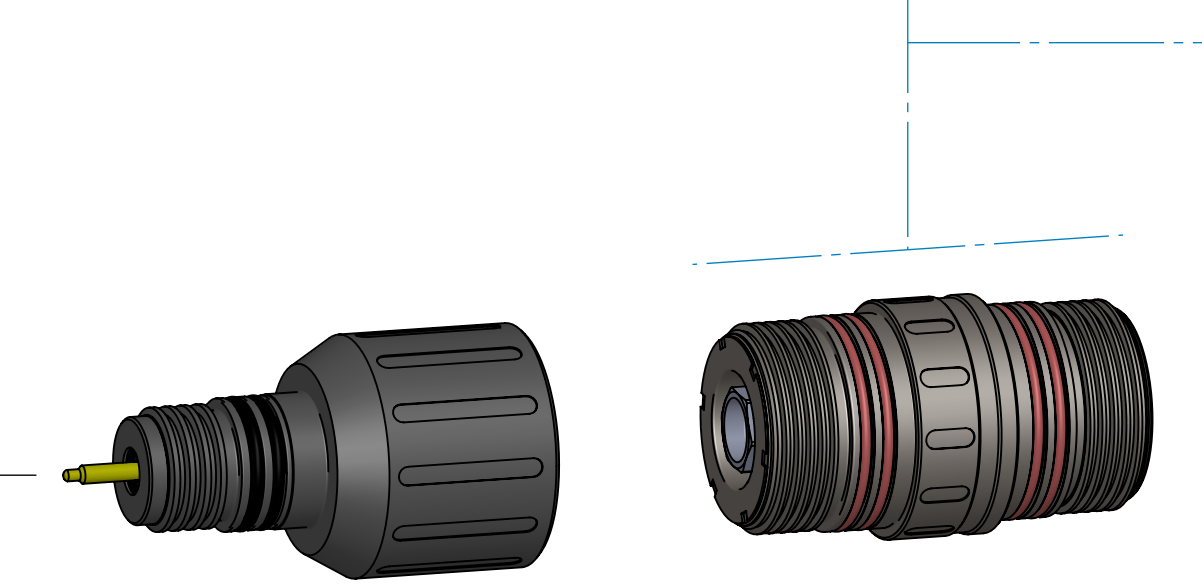
MEDIUM FEED THROUGH
PART # 900003
LENGTH: 4-1/2"

OPTIONAL SUB SAVER,
PART NO. 900139

O-RING "A"

GROOVE INDICATES
DOWN HOLE END

SIZE	O-RING "A"
2-3/4"	#227
3-1/8"	#230
3-3/8"	#231



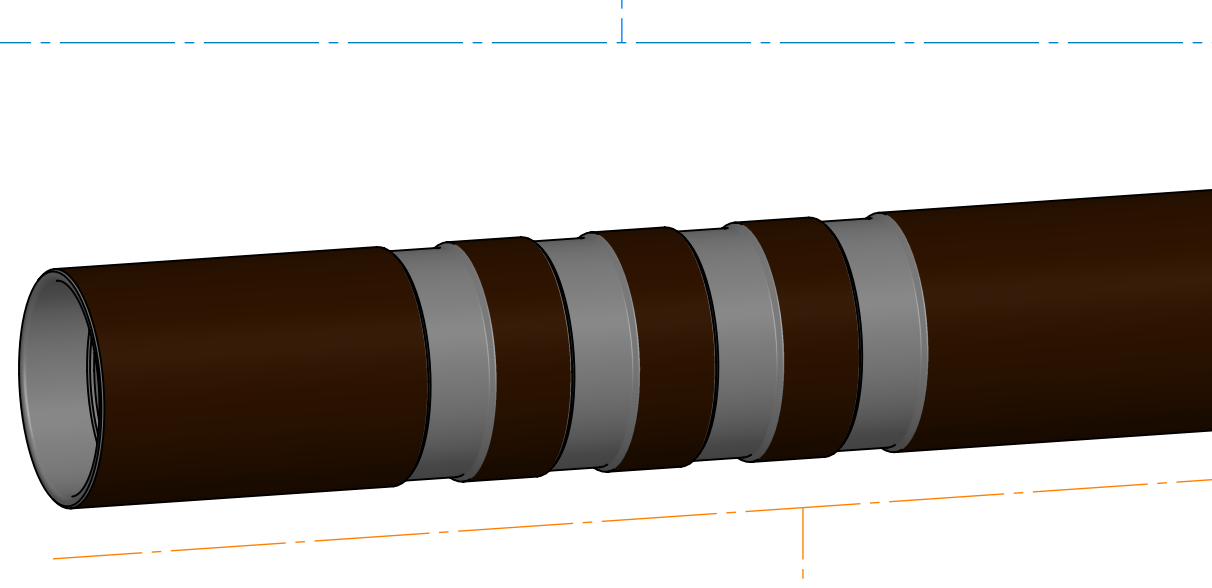
DISPOSABLE SUB

DISCARD SUB AFTER USE
DO NOT REUSE

SIZE	O-RING "B"
2-3/4"	#227
3-1/8"	#230
3-3/8"	#231

O-RING "B"

RETAINER NUT TO UP HOLE SIDE



COLLAR TANDEM SUB

COLLAR PART NO. XXXYYY

XXX	YYY
275 FOR 2-3/4"	SIZE IN INCHES
313 FOR 3-1/8"	EXAMPLE 355 FOR 3.550"
337 FOR 3-3/8"	

RETAINER NUT TO UP HOLE SIDE
TORQUE TO 40 LB FT

LONG FEED THROUGH
PART #900004
LENGTH: 5-5/8"

O-RING "C"

SIZE	O-RING "C"
2-3/4"	#227
3-1/8"	#230
3-3/8"	#231



- GENERAL NOTES:
- ENSURE ALL SEAL SURFACES ARE CLEAN AND FREE OF DEFECTS
 - ENSURE TOP SUB BOX END IS NOT EGGED, DO NOT FORCE THREAD ENGAGEMENT

FIRING HEAD CPST

RETAINER NUT TO UP HOLE SIDE
TORQUE TO 40 LB FT

MEDIUM FEED THROUGH
PART #900003
LENGTH: 4-1/2"

ENSURE HOLES ARE CLEAR

PART NO. 900062

USE THREADED TOOL TO
INSERT IGNITER, THEN INSTALL
COMPONENTS

TORQUE TO 100 LB FT

O-RING "D"

GROOVE INDICATES
DOWN HOLE END

O-RING "E"

O-RING "F"

REBUILD KIT PART NO. 1020RK

SIZE	O-RING "D"	O-RING "E"	O-RING "F"
2-3/4" BAKER 10	#227	#220	#222
3-1/8" BAKER 10	#230	#220	#222
3-1/8" BAKER 20	#230	#220	#328
3-1/8" SHORTY 3-1/2"	#230	#220	#332
3-3/8" BAKER 10	#231	#220	#222
3-3/8" BAKER 20	#231	#220	#328
3-3/8" SHORTY 3-1/2"	#231	#220	#332

FIRING HEAD 074

RETAINER NUT TO UP HOLE SIDE
TORQUE TO 40 LB FT

MEDIUM FEED THROUGH
PART #900003
LENGTH: 4-1/2"

ENSURE HOLES ARE CLEAR

PART NO. 900065

TORQUE TO 100 LB FT

O-RING "G"

GROOVE INDICATES
DOWN HOLE END

O-RING "H"

O-RING "I"

REBUILD KIT PART NO. 74RK

SIZE	O-RING "G"	O-RING "H"	O-RING "I"
2-3/4" BAKER 10	#227	#220	#222
3-1/8" BAKER 10	#230	#220	#222
3-1/8" BAKER 20	#230	#220	#328
3-1/8" SHORTY 3-1/2"	#230	#220	#332
3-3/8" BAKER 10	#231	#220	#222
3-3/8" BAKER 20	#231	#220	#328
3-3/8" SHORTY 3-1/2"	#231	#220	#332

CARTRIDGE FIRING HEAD

RETAINER NUT TO UP HOLE SIDE
TORQUE TO 40 LB FT

EXTRA SHORT FEED THROUGH
PART #900001
LENGTH: 2"

PART NO. 900145

TORQUE TO 10 LB FT

TORQUE TO 100 LB FT

O-RING "J"

GROOVE INDICATES
DOWN HOLE END

O-RING "L"

O-RING "K"

REBUILD KIT PART NO. 145RK

SIZE	O-RING "J"	O-RING "K"	O-RING "L"
2-3/4" BAKER 10	#227	#220	#222
3-1/8" BAKER 10	#230	#220	#222
3-1/8" BAKER 20	#230	#220	#328
3-1/8" SHORTY 3-1/2"	#230	#220	#332
3-3/8" BAKER 10	#231	#220	#222
3-3/8" BAKER 20	#231	#220	#328
3-3/8" SHORTY 3-1/2"	#231	#220	#332

DOWN HOLE

SWITCH WIRING

WIRE COLOR	GUN SWITCH	PLUG SWITCH
WHITE	UP HOLE TELEMETRY	UP HOLE TELEMETRY
BLUE	DOWN HOLE TELEMETRY	-
PURPLE	DETONATOR HOT	-
RED	DETONATOR GROUND	-
BLACK	SWITCH GROUND	SWITCH GROUND
YELLOW	-	IGNITER HOT

CONNECTORS

REMOVE SHUNT

MATE CONNECTORS

AUDIBLE CLICK

SCOTCHLOCS

ENSURE WIRES ARE FULLY INSERTED

DEPRESS BUTTON FULLY
USING TOOL: 3M E-J9

INTERNAL METAL STRIPS CREATE CONTACT
WHEN BUTTON IS COMPRESSED

WIRES

DETONATOR CORD

ENSURE DET CORD IS FULLY
SEATED IN CHARGE EARS

INSERT DETONATOR
FULLY INTO BLOCK

ORIENT WIRES AWAY
FROM CHARGE

CONTINUE DET CORD PAST DET BLOCK AND
TERMINATE IN THE CHARGE TUBE ASSEMBLY

TEST BOX

- PRESS THE POWER BUTTON ON THE LOWER RIGHT-HAND SIDE OF THE BOX
- ROTATE THE DIAL UNTIL THE OUTER RING BLUE LIGHT INDICATES THE TOTAL NUMBER OF SWITCHES TO BE CHECKED.
- PRESS THE OK BUTTON ONCE AND A YELLOW LIGHT ON THE INNER WILL CONFIRM THE NUMBER OF SWITCHES TO BE CHECKED.
- PRESS THE OK BUTTON A SECOND TIME TO INITIATE THE INVENTORY. THE LIGHTS WILL PROCEED TO ILLUMINATE IN A CLOCKWISE DIRECTION AS SWITCHES ARE INVENTORIED READING FROM THE TOP OF THE GUN TO THE BOTTOM.
 - THE OUTER RING LIGHTS WILL ILLUMINATE BLUE INDICATING THE SWITCH WAS FOUND.
 - THE INNER RING LIGHTS WILL ILLUMINATE GREEN INDICATING THE DETONATOR WAS DETECTED OR RED INDICATING A DETONATOR WAS NOT DETECTED.
- SWITCH CONFIGURATION:
 - IF ONLY TESTING SWITCHES ALL THE OUTER RING LIGHTS WILL BE BLUE WITH THE INNER (DETONATOR) LEDS GREEN OR RED.
 - IF TESTING WITH A PERFSRIKE (RELEASE TOOL SWITCH) THE FIRST SWITCH CONFIRMATION LIGHT WILL BE ILLUMINATED PURPLE (PURPLE BRT SWITCH).
 - THE PLUG SWITCH CONFIRMATION LIGHT WILL ALWAYS BE ILLUMINATED YELLOW (YELLOW PLUG SWITCH).
- ONCE THE SWITCH CHECK IS COMPLETE EITHER:
 - THE PASS INDICATOR LIGHTS WILL ILLUMINATE GREEN AND THE PLUG FOUND INDICATOR LIGHT WILL ILLUMINATE YELLOW.
 - THE FAIL INDICATOR LIGHT WILL FLASH RED, AND A CORRESPONDING INDICATOR LIGHT WILL ALSO FLASH; REFERENCE THE INVENTORY STATUS INDICATOR LIGHT FOR THE FAILURE REASON AND CHECK THE SWITCH/GUN THAT FAILED.

OUTER RING - BLUE, PURPLE OR YELLOW LIGHTS

INNER RING - GREEN, RED OR YELLOW LIGHTS

INVENTORY STATUS INDICATOR LIGHTS	
HIGH # OF SWITCHES	MORE SWITCHES FOUND THAN REQUESTED
LOW # OF SWITCHES	LESS SWITCHES FOUND THAN REQUESTED
MISSING WIRE	NO RESISTANCE TO DETONATOR LEG WIRES
PLUG FOUND	RESISTANCE TO PLUG SWITCH (IGNITER PASS THROUGH WIRE)
DUPLICATE ADDRESS	TWO SWITCHES WITH SAME ADDRESS IN TOOL STRING
POOR SIGNAL	WEAK SIGNAL POSSIBLE OPEN CIRCUIT
SHORT / OVERCURRENT	OVER CURRENT DETECTED, POSSIBLE SHORT CIRCUIT
BATTERY LOW	CHANGE BATTERIES SOON

STATUS INDICATORS