

DIESEL MECHANIC



MINING QUALIFICATIONS AUTHORITY

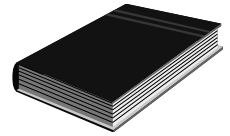
CODE: TC

CUT A THREAD WITH STOCK AND DIES

INDEX

The following elements are contained in this learning guide:

TOPIC	PAGE NUMBER
Index	2
Source reference	3
Objective	4
Hazard Identification and Control (HIAC) form	5
Select and fit dies	6 – 8
Practice	9
Cut a thread	10 – 12
Practice	13



SOURCE REFERENCES

Demonstration by a competent person e.g. a Training Officer.

OBJECTIVE

You will be learning towards the outcome “Cut a thread with stock and dies”. Whilst learning towards the outcome you will be required to achieve the following:

- Cut threads with stock and dies.

On completion of this module, the learner must be able to cut threads on mild steel round bars with stock and dies.

During this process you must adhere to certain specified requirements as listed in the Module.

ASSESSMENT AND EVALUATION CRITERIA

You will be assessed, when you are confident that you may achieve the outcomes as listed, to determine your competence as measured against the required criteria. This assessment will be in line with accepted best practices regarding assessment.

- A practical test will be set at the end of the module and must be completed without using references.
- The learner will be given a full set of stock and dies and will be required to cut a specified thread at both ends of a piece of round bar.

The following standards must be achieved:

- The guide must match the diameter of the material.
 - The die block must enter square onto the round bar.
 - The thread must be 25mm long within ± 2 mm at each end of the round bar.
 - The threads must not be torn.
 - The matching nut must fit correctly.
 - There must be no damage to tools and equipment.
- All safety procedures must be adhered to.

HAZARD IDENTIFICATION AND CONTROL (HIAC) FORM**TC****CUT A THREAD WITH STOCK AND DIES**

STEPS IN OPERATION / PROCESS	POTENTIAL ACCIDENT / INCIDENT	CONTROLS (BY RESPONSIBLE PERSON)
1. Use hand tools.	<ul style="list-style-type: none"> Using damaged tools or wrong tools for the job can cause injury and damage to equipment. 	<ul style="list-style-type: none"> Always use the correct tool for the job. Ensure tools are in good condition. Use tools correctly. Wear appropriate PPE where necessary. Always take good care of tools. Maintain, clean and store it properly.
2. Cut threads with stock and dies.	<ul style="list-style-type: none"> Burrs and swarf can cause hand injuries 	<ul style="list-style-type: none"> Clean away swarf with a brush. Do not use unprotected hands.
	<ul style="list-style-type: none"> Cutting compound and fluids may be toxic and could be harmful to the skin. 	<ul style="list-style-type: none"> Wash your hands with soap and water after use.

NOTE: Before doing the practical work contained in this module, the learner must study the content of the above HIAC form again and then sign the statement below.

The above risks, which will be encountered in this module, are fully understood and will be controlled during the practical work.

Signature of learner:

Signature of Training Officer:

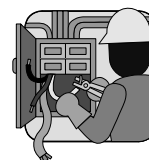
Date:

1. SELECT AND FIT DIES

ITEM / TASK: Introduction.

DESCRIPTION:

- A. The term “die”, as used in this module, is a device for cutting external threads on to a round bar.
- B. There are various types of dies for cutting external threads. The dies selected for this module are the adjustable / solid type, namely:
 - The adjustable round die
 - The two part adjustable die, and
 - The solid round die.
- C. Dies are available in sets or separate and have their sizes engraved on them.
- D. Dies are fitted into a stock (handle) to form a tool for cutting external threads.



ITEM / TASK: Fit and adjust an adjustable round die.

DESCRIPTION:

- A. Select the required die. The size of the die is engraved on the face on the same side as the lead. (Chamfer in the die block)
- B. Fit the round split die in the stock. The split must be positioned to line up with the screw in the centre. (Fig 1)

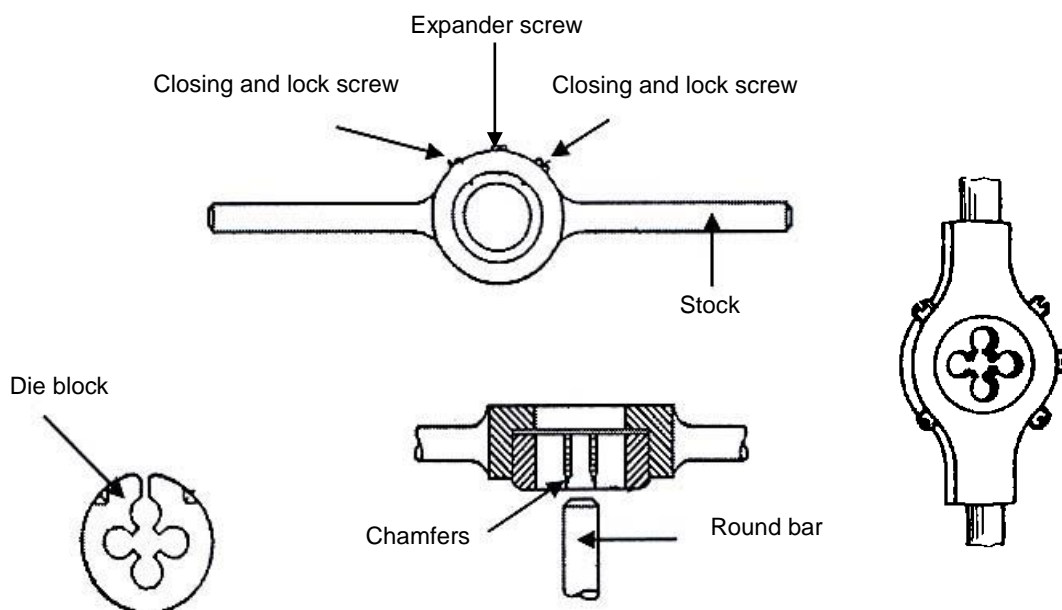


FIG 1.

- C. Tighten the expander screw to expand the die to its maximum diameter.
- D. Tighten the other two lock screws to hold the die firmly.
- E. To adjust the die to cut smaller, loosen the expander screw in the split and tighten the other two closing and lock screws.

ITEM / TASK: Fit and adjust a two part adjustable die.

DESCRIPTION:

- A. Select a set of the required size dies.

NB:

Remember, that the dies are a matching set, i.e. the numbers stamped on the dies must be the same.

- B. Unscrew the adjusting screws to allow the maximum opened diameter of the dies. (Fig 2)

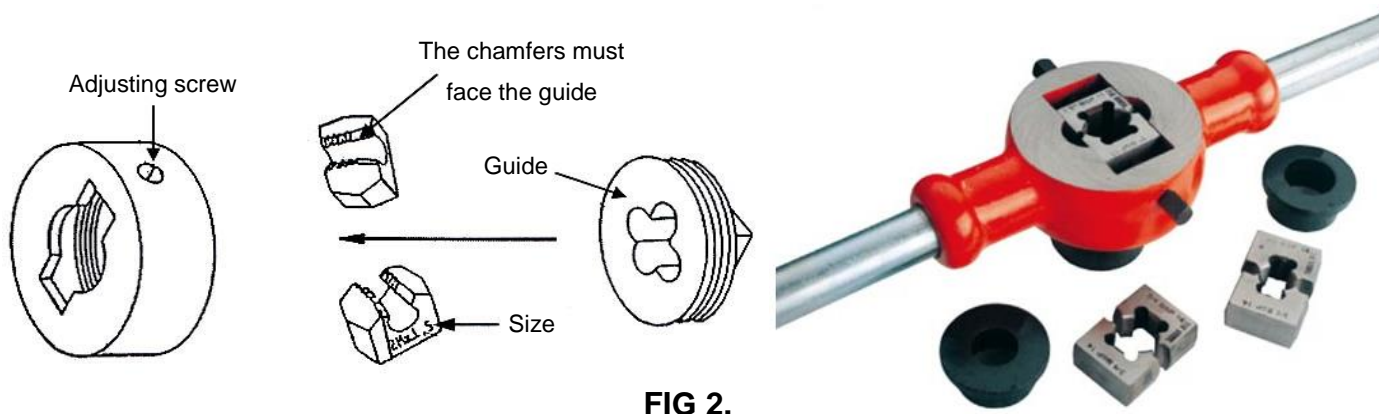
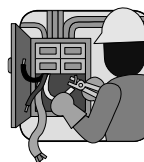


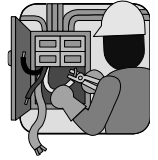
FIG 2.

- C. Fit the dies into the die block so that the tapered end enters onto the material first.
- D. Select a guide that will fit over the material to be screwed, with about 0.5mm clearance.
- E. Fit the guide into the die block to hold the dies in position.
- F. To adjust the dies, the adjusting screws must be screwed in evenly on either side of the die block.

Note:

The dies have marks to line up with the marks on the block to indicate the depth of the cut.





ITEM / TASK: Fit a solid round die.

DESCRIPTION:

- A. Select the required die. The size of the die is engraved on the face on the same side as the lead. (Chamfer in the die block)
- B. Fit the round solid die in the stock. The hollow indentions must be positioned to line up with the lock screws. (Fig 3)

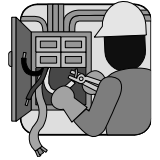


FIG 3.

Note:

The solid round die is not adjustable.

**DO THE PRACTICE ON THE NEXT PAGE BEFORE CONTINUING
WITH THE REST OF THE MODULE.**



PRACTICE

Select a:

- split round die and fit it in the stock and adjust it to its maximum diameter.
- two part adjustable die set, fit it in the die block and adjust it to the required diameter.
- solid round die and fit it in the stock. The solid round die is not adjustable.

Ask your Training Officer to check your work and if it is correct, to sign below.

LEARNER	TRAINING OFFICER
DATE :	DATE :
SIGNATURE :	SIGNATURE :

2. CUT A THREAD

ITEM / TASK: Introduction.

DESCRIPTION:

- A. The outside diameter of the material must be the same diameter as the thread to be cut.
- B. Measure the outside diameter of the round bar, if it is not known, and select the appropriate dies.

NB:

The outside diameter and the pitch of the thread are stamped on the dies. For example, M12 x 1.5 means 12mm outside diameter thread with a 1.5mm pitch.

Two part adjustable die set.

- C. Select a guide, which will fit over the round bar with an approximate 0.5mm clearance.
- D. Mount the dies into the stock to allow the tapered end to enter on the material first.

(Fig 3)

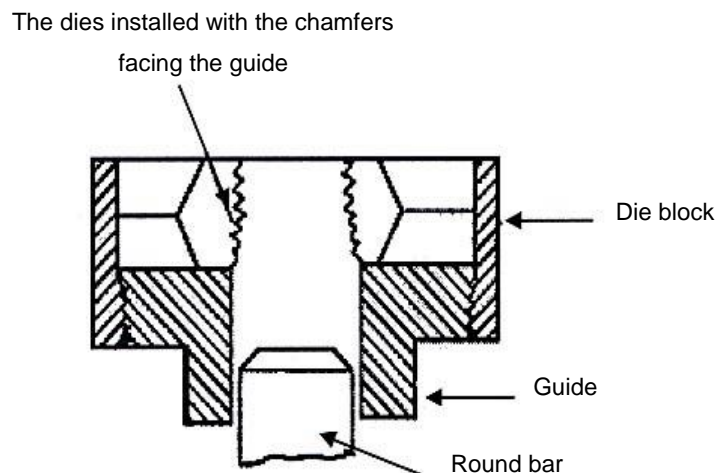


FIG 3.

Split / solid round die.

- E. Mount the split round die into the stock to allow the tapered end to enter on the material first. (Fig 4 on the following page)

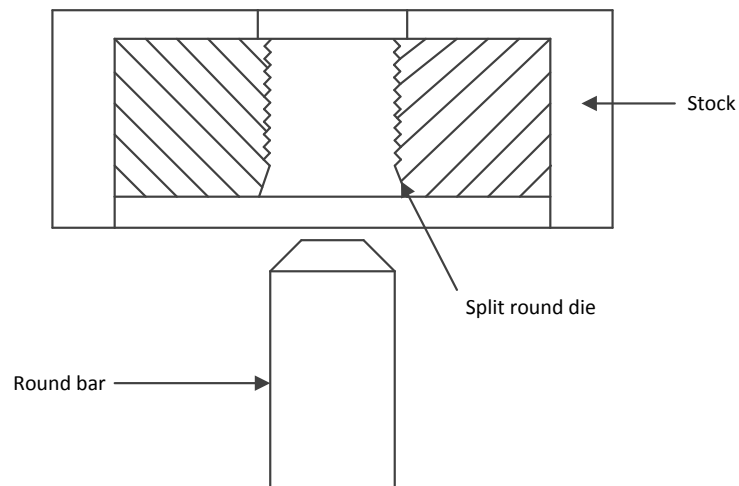


FIG 4.

ITEM / TASK: Cutting the thread.

DESCRIPTION:

A. Chamfer the end of the round bar with a smooth file. (Fig 5)

The width of the chamfer is half the thread pitch

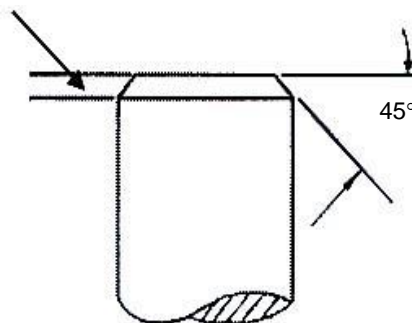


FIG 5.

- B. Clamp the workpiece firmly and vertically in the vice. Protect the workpiece from damage by using a vice with soft jaws or copper shims.
- C. Adjust the dies to cut the thread for about **half the full depth** of the thread. (Applicable to the two part adjustable die set and split round die only)
- D. Enter the dies onto the material by applying moderate pressure on the dies. At the same time turn the stock in a clockwise direction.
- E. Ensure that the dies are square with the round bar.



- F. Use a cutting fluid / paste whilst cutting.
- G. After the dies have entered onto the material, keep on turning the stock in a clockwise direction with both hands. Reverse the stock, half a turn after every two turns to break the shavings. This is to protect the thread from tearing and damaging the dies. Solid round dies need to be reversed after each forward turn. Use a liberal amount of cutting fluid / paste while cutting the thread.
- H. Cut the thread to its full length.

Note:

To measure the length of the thread, add the width of the die to the portion of the round bar protruding above the die block.

- I. Adjust the dies to cut **nearly the full depth** of the thread. (Applicable to the two part adjustable die set and split round die only)

Note:

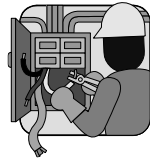
Solid round dies will cut the full depth of the thread in one cut.

- J. Cut the thread to a length equal to the width of the dies.
- K. Remove the stock and try to fit the standard matching nut on the thread.
- L. Adjust the dies until a good fit of the nut is obtained. (Applicable to the two part adjustable die set and split round die only)
- M. Cut the full length of the thread.

NB:

Always use a brush to remove the shavings from the threads. Never use your hands.

DO THE PRACTICE ON THE NEXT PAGE.



PRACTICE

- Cut 100mm round bar pieces (8mm, 10mm and 12mm diameter).
- Select appropriate dies to cut threads on each of the round bars.
- Thread each end of the round bars 20mm long.
- Fit matching nuts to the threaded ends.

For more practice, cut off the threaded ends and continue to cut threads as before.

Ask your Training Officer to check your work and if it is correct, to sign below.

LEARNER	TRAINING OFFICER
DATE :	DATE :
SIGNATURE :	SIGNATURE :



REMEMBER ALWAYS WORK SAFE

Once you have passed the entire practices, you are now at liberty to request a Formative Assessment from your Assessor.