1. Engines removed from the implement are easier and safer to work on if mounted on an _________ stand. *However, most service work doesn’t involve full removal because “time is money”.*

2. A ________________ (paper or electronic) is an important reference that must be used when servicing engines and implements because every model is built to different specifications & dimensions.

3. A technician should look for causes of engine problems ____________ removing the engine from the implement (piece of equipment). This can save time and lead to better problem solving & repair.
   *Use the procedure known as the 3 C’s when repairing.*

4. **Marking parts** can be done with ______________ marks, ______________ flags, number or letter punches and even paint. Flags are used mostly for hose and wiring identification.

5. ________________ a repair or service job increases success & saves you time and effort.

6. Cylinders can be separate parts that are removable from the crankcase or can be ______________, which means “one-piece with” or “a part of”. Integral components are not removable from one another.

7. Pistons are removed through the ______ of the cylinder on an integral block & crankcase engine.

8. The unworn area above ring travel in the cylinder (1/8”-1/4”) is known as a ________________ and must be removed with a ring ridge reamer or with abrasive paper before taking the piston out through the top of the cylinder. This prevents ring breakage and possible piston skirt damage.

9. Cylinder wear is greatest on two “thrust surfaces” located 90 degrees to the ________________ and wrist pin centerline. This will cause an oval or out-of-round shape to the worn cylinder.

10. Increased wear at the top of the cylinder is due to a lack of ________________ because of the diluting effect of raw gasoline on the engine oil, excessive heat, and the high pressure build-up behind the piston rings which greatly forces them out against the cylinder wall.

11. There is a gradual ____________ in most worn cylinders. Bores maintain original size below the area of ring travel and tend to wear bigger at the top of the cylinder.

12. **Cylinder service needs are determined by cylinder wall condition.** If the bore is not damaged and the taper & out-of-round dimensions are within tolerances, only a light ________________ may be needed.
13. ______________ - plated aluminum cylinders and pistons should be **discarded** if they are at all worn.

14. Cylinder _____________ or liners may be of the **flanged** type, **removable** type or may be of the **integral** type which are cast right into the block as a permanent piece.

15. Worn cylinders may be ______________ (**bored out**) in steps of .010” and fit with new pistons which are available in standard + .010”, +.020”, and + .030” sizes. The **.010” increments** make it easier for parts suppliers and service facilities to stock the correct parts on their shelves. *(parts in stock = money)*

16. Cylinder **oversizing** or **boring out** may be done with a rigid ___________ tool driven by a heavy duty, slow speed, electric drill or drill press.

17. ______________ or **deglaizing is an abrasive finishing process** that removes boring tool marks from the cylinder. **Honing is also done to a glazed cylinder wall to simply restore crosshatch marks.**

![Image 1](image1.jpg)

18. The **honing process** places a fine, ___________ - ___________ **surface finish** on the cylinder wall.

19. The **cross-hatch** in a cylinder is just deep enough to hold _______ which lubricates the cylinder wall as the piston & rings glide up & down. **Oil also seals** the piston rings to the cylinder wall. A cylinder with little or no cross-hatch will have poor compression.

   **The difference between dry compression test readings & wet compression test readings will be greater on cylinders with little or no cross-hatch remaining.**

   **Cross-hatch can be destroyed by “abrasive ingestion” either with the incoming air or in the oil.**

20. The smoothness of cylinder finishes depends upon the ___________ of the **stones used during honing.**

![Image 2](image2.jpg)